Responsible Fishery Management (RFM)

U.S Alaska Pacific halibut and sablefish commercial fisheries

Reassessment Report

Certification Body (CB):	**Global Trust Certification**
Assessment team:	Dr. Ivan Mateo, Lead Assessor Dr. Robert Leaf, Assessor Mr. R.J. (Bob) Allain, Assessor
Fishery client:	Alaska Fisheries Development Foundation
Assessment Type:	Reassessment
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Global Trust Certification
Quayside Business Park,
Mill Street, Dundalk,
Co. Louth, Ireland.
T: + 353 42 932 0912
E: ClientServicesie@nsf.org

Foreword

The Responsible Fisheries Management (RFM) Certification program is a third-party sustainable seafood certification program for wild capture fisheries owned by the Certified Seafood Collaborative (CSC), a 501(c)(3) non-profit foundation led by a diverse board of seafood and sustainability industry experts.

The program was previously owned by the Alaska Seafood Marketing Institute (ASMI) when it was known as the Alaska RFM program but when ownership passed to the CSC in July 2020 scope of the program was expanded to include other North American fisheries outside the State of Alaska.

The Responsible Fisheries Management (RFM) Standard is composed of Conformance Criteria based on the 1995 FAO Code of Conduct for Responsible Fisheries and the FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries adopted in 2005 and amended/extended in 2009. The Standard also includes full reference to the 2011 FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Inland Fisheries which in turn are now supported by a suite of guidelines and support documents published by the UN FAO. Further information on the RFM program may be found at: https://www.alaskaseafood.org/rfm-certification/.

1 Contents

1.1 List of Figures

1.2 List of Tables

2 Glossary

Acronym	Full Name
ABC	Allowable Biological Catch
ABOF	Alaska Board of Fisheries
ADFG	Alaska Department of Fish and Game
ADP	Annual Deployment Plan (at-sea observers)
ADPS	Alaska Department of Public Safety
AWT	Alaska Wildlife Troopers
BSAI	Bering Sea and Aleutian Islands
CQE	Community Quota Entity
CDQ	Community Development Quota
CPUE	Catch Per Unit Effort
CSP	Catch Sharing Plan
DMR	Discard Mortality Rate (Halibut)
EEZ	Exclusive Economic Zone
EIS	Environmental Impact Statement
EM	Electronic Monitoring
ER	Electronic Reporting
FC	Fundamental Clause
FISS	Fishery-Independent Setline Survey
FMP	Fishery Management Plan
FY	Fiscal Year
GOA	Gulf of Alaska
IFQ	Individual Fishing Quota
IPHC	International Pacific Halibut Commission
JEA	Joint Enforcement Agreement
MSL	Minimum Size Limit
MSA	Magnuson-Stevens Act
MSE	Management Strategy Evaluation
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NOAA	National Oceanic and Atmospheric Administration
NOAA - OLE	National Oceanic and Atmospheric Administration Office Law Enforcement
NMFS	National Marine Fisheries Service
NPFMC	North Pacific Fishery Management Council
NPOP	North Pacific Observer Program
OFL	Overfishing Level
OLE	Office of Law Enforcement (NOAA)
PSC	Prohibited Species Catch
RFM	Responsible Fisheries Management (Scheme)
SCAA	Statistical Catch-At-Age
SEIS	Supplemental Environmental Impact Statement

Acronym	Full Name
SIR	Supplementary Information Report
SSC	Scientific and Statistical Committee
TAC	Total Allowable Catch
USCG	United States Coast Guard

3 Executive Summary

Brief intro and description of assessment process.

The Alaska Pacific Sablefish (Black cod) Commercial Fishery (200nm EEZ) and the Alaska Pacific Halibut Commercial Fishery (200nm EEZ) were reassessed against the requirements of the AK-RFM Certification Program. The request for reassessment was made by Alaska Fisheries Development Foundation, and was conducted by Global Trust Certification Ltd. The Alaska Pacific Sablefish (Black cod) Commercial Fishery was originally certified originally certified on 11th October 2011, and recertified 9th January 2017. The Alaska Pacific Halibut Commercial Fishery (200nm EEZ) was originally certified on 23rd April 2011, and recertified 9th January 2017.

This second reassessment report documents the reassessment procedure for the continuing certification of commercial fisheries, to the Alaska RFM Certification Program. This is a voluntary program for Alaska fisheries and has been supported by ASMI and later by Certified Seafood Collaborative (CSC) who wish to provide an independent, third-party certification program that can be used to verify that Alaska fisheries are responsibly managed according to the FAO Code of Conduct for Responsible Fisheries.

The reassessment was conducted according to the Global Trust procedures for RFM Certification in accordance with EN45011/ISO/IEC Guide 65 accredited certification procedures. The reassessment is based on the criteria specified in the Responsible Fisheries Management Standard Version 2.1. The RFM Standard is composed of conformance criteria based on the 1995 FAO Code of Conduct for Responsible Fisheries and the FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries adopted in 2005 and amended/extended in 2009; hereafter generally referred to as the FAO Criteria. The Standard also includes full reference to the 2011 FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Inland Fisheries which in turn are now supported by a suite of guidelines and support documents published by the UN FAO.

The assessment is based on 4 major components of responsible management derived from the FAO Code of Conduct for Responsible Fisheries (1995) and Guidelines for the Eco-labelling of products from marine capture fisheries (2009); including:

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

These four major components are supported by 12 fundamental clauses (+ 1 in case of enhanced fisheries) that guide the RFM Certification Program surveillance assessment.

The reassessment process included a desktop review of relevant new documentary information including but not limited to: the most current fishery assessment and stock evaluation reports; Groundfish Plan team reports and meeting minutes; Council publications; relevant scientific publications; ecosystem status reports; fishery management plans and amendments thereof; changes to state and federal regulations; fishery enforcement statistics; environmental impact statements; marine mammal stock assessments; and strategic plans (see Section 10 - References for a more complete listing of documents reviewed).

The reassessment process also included substantive meetings with representatives from each of the key fishery management agencies charged with management of the AK Pacific Sablefish and AK Pacific halibut commercial fisheries during the time of the 5th surveillance being conducted.

Assessment team meetings included representatives from: North Pacific Fishery Management Council (NPFMC), Alaska Department of Fish & Game (ADFG), Alaska Fisheries Science Center (AFSC), NOAA National Marine Fisheries Alaska Regional Office (NOAA Regional), and the International Pacific Halibut Commission (IPHC, aka the "Commission"). Owing to constraints imposed by COVID-19 pandemic, all meetings were held remotely via videoconferencing.

The Draft Report was available for comment by stakeholders who have registered interest with Global Trust during a 30-day period.

A summary of the site meetings is presented in Section 5. Assessors included both externally contracted fishery experts and Global Trust internal staff (Appendix 1). Peer reviewers were comprised of external contracted fisheries consultants.

This report documents each step in the reassessment process and presents the recommendation to the Certification Committee of Global Trust who will preside over the certification decision according to the requirements of ISO/IEC Guide 65 accredited certification.

Main strengths and weaknesses of the fishery.

Strengths	Weaknesses
AK Sablefish • Well-defined reference points exist and harvest control rules are in place. • Robust Habitat Management Strategy is demonstrated. • Robust governance and policy are demonstrated. **AK Pacific Halibut** • Well-defined reference points exist and harvest control rules are in place. • Robust Habitat Management Strategy is demonstrated. • Robust governance and policy are demonstrated	**AK Sablefish** No weaknesses were found **AK Pacific Halibut** • There are concerns about potential impact the Halibut fishery has on corals and other sensitive habitats (i.e., Sponges).

Recommendation of the Team with respect to Certification.

The Assessment Team recommends that the management system of the applicant fishery, the US Alaska Pacific sablefish (black cod) commercial fishery, under, federal (NMFS/NPFMC) and state (ADFG) management, fished with benthic longline, pots and trawl (within Alaska's 200 nm EEZ), is certified against the CSC Responsible Fisheries Management Certification Program.

The Assessment Team recommends that the management system of the applicant fishery, the US Alaska Pacific halibut commercial fishery, under international (IPHC), federal (NMFS/NPFMC) and state (ADFG) management, fished with benthic longline, pots and troll (within Alaska's 200 nm EEZ), is certified against the CSC Responsible Fisheries Management Certification Program.

3.1 Assessment Team Details

The Assessment Team for this assessment was as follows; further details are provided in Appendix 1 – External Peer Review):

- Dr. Ivan Mateo – Lead Assessor, Responsible for Fundamental Clauses 9, 12
- Dr. Robert Leaf – Assessor 1, Responsible for Fundamental Clauses 4, 5, 6, 7
- Mr. R.J. (Bob) Allain – Assessor 2, Responsible for Fundamental Clauses 1, 2, 3, 8, 10, 11

3.2 Details of Applicable RFM Documents

This assessment was conducted according to the relevant program documents outlined in Table 1 below.

Table 1. Relevant RFM program documents including applicable versions.

Document title	Version number, Issue Date	Usage
RFM Procedure 2: Application to Certification Procedures for the RFM Fishery Standard	Version 6, September 2020	Process
Responsible Fisheries Management Certification Program Fisheries Standard.	Version 2.1, September 2020	Standard
Responsible Fisheries Management Certification Program Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America	Version 2.1, January 2021	Guidance to Standard

4 Fishery Applicant Details

Table 2. Fishery Applicant details and key contact information.

Applicant Information		
Organization/Company Name:		Alaska Fisheries Development Foundation
Address:	Street:	P.O. Box 2223
	City:	Wrangell
	State:	Alaska
	Country:	USA
	Zip code	99929-2223
Applicant Key Contact Information		
Name:		Julie Decker
Position:		Director
E-mail:		jdecker@afdf.org

5 Units of Assessment and Proposed Units of Certification

5.1 Units of Assessment

The Units of Assessment are as described below in Table 3 for sablefish and Table 4 for Pacific halibut.

Table 3. Units of Assessment details, Sablefish.

Unit of Assessment 1 (of 2)		
Species:	Common name:	Sablefish (Black cod)
	Latin name:	*Anoplopoma fimbria*
Geographical area:		U.S. Federal and State fisheries within the Gulf of Alaska and the Bering Sea & Aleutian Islands
Stock(s):		Eastern Pacific
Management system:		U.S. Federal and State fisheries within the Gulf of Alaska and the Bering Sea & Aleutian Islands managed by: ▪ National Marine Fisheries Service (NMFS) ▪ North Pacific Fishery Management Council (NPFMC) ▪ Alaska Department of Fish and Game (ADFG) and Board of Fisheries (BOF)
Fishing gear/method:		Unique to each UoC
UoC 1		Benthic longline
UoC 2		Pots
UoC 3		Bottom trawl
All eligible fishery participants:		Eligible fishery participants are defined by membership of the client group.

Table 4. Units of Assessment details, Pacific halibut.

Unit of Assessment 2 (of 2)		
Species:	Common name:	Pacific halibut
	Latin name:	*Hippoglossus stenolepis*
Geographical area:		U.S. Federal and State fisheries within the Gulf of Alaska and the Bering Sea & Aleutian Islands
Stock(s):		Eastern Pacific
Management system:		U.S. Federal and State fisheries within the Gulf of Alaska and the Bering Sea & Aleutian Islands managed by: ▪ International Pacific Halibut Commission (IPHC) ▪ National Marine Fisheries Service (NMFS) ▪ North Pacific Fishery Management Council (NPFMC) ▪ Alaska Department of Fish and Game (ADFG) and Board of Fisheries (BOF)
Fishing gear/method:		Unique to each UoC
UoC 1		Benthic longline
UoC 2		Pots
UoC 3		Troll
All eligible fishery participants:		Eligible fishery participants are defined by membership of the client group.

5.2 Unit(s) of Certification

Based on the above Units of Assessment, the Units of Certification (i.e., what would be covered by any resulting certificate if the fishery is ultimately certified) are as described below in Table 5 for sablefish and Table 6 for Pacific halibut.

Table 5. Proposed Units of Certification details, Sablefish.

Unit of Certification 1 (of 2)		
Species:	Common name:	Sablefish (Black cod)
	Latin name:	*Anoplopoma fimbria*
Geographical area:		U.S. Federal and State fisheries within the Gulf of Alaska and the Bering Sea & Aleutian Islands
Stock(s):		Eastern Pacific
Management system:		U.S. Federal and State fisheries within the Gulf of Alaska and the Bering Sea & Aleutian Islands managed by: ▪ National Marine Fisheries Service (NMFS) ▪ North Pacific Fishery Management Council (NPFMC) ▪ Alaska Department of Fish and Game (ADFG) and Board of Fisheries (BOF)
Fishing gear/method:		Unique to each UoC
UoC 1		Benthic longline
UoC 2		Pots
UoC 3		Trawl
Client group:		Alaska Fisheries Development Foundation

Table 6. Proposed Units of Certification details, Pacific halibut.

Unit of Certification 2 (of 2)		
Species:	Common name:	Pacific halibut
	Latin name:	*Hippoglossus stenolepis*
Geographical area:		U.S. Federal and State fisheries within the Gulf of Alaska and the Bering Sea & Aleutian Islands
Stock(s):		Eastern Pacific
Management system:		U.S. Federal and State fisheries within the Gulf of Alaska and the Bering Sea & Aleutian Islands managed by: ▪ International Pacific Halibut Commission (IPHC) ▪ National Marine Fisheries Service (NMFS) ▪ North Pacific Fishery Management Council (NPFMC) ▪ Alaska Department of Fish and Game (ADFG) and Board of Fisheries (BOF)
Fishing gear/method:		Unique to each UoC
UoC 1		Benthic longline
UoC 2		Pots
UoC 3		Troll
Client group:		Alaska Fisheries Development Foundation

6 Background to the Fishery

6.1 Species Biology

6.1.1 Sablefish Biology

Sablefish (*Anoplopoma fimbria*), also known as black cod, are a groundfish species in the family Anoplopomatidae, which has only one other species, the skilfish (*Erilepis zonifer*). Sablefish are elongate in shape and are dark gray to black on their upper body with a lighter gray under side. Sablefish look much like cod. They are often referred to as black cod, even though they are not actually part of the cod family. Sablefish have been recorded to reach sizes of 114 cm in fork length from nose to tip of the tail and a weight of up to 25 kg (provide reference). An average sized sablefish from the 2010 Southeast Alaska state fisheries was 69.1 fork length (cm) and 3.7 kg.

Distribution

Sablefish (*Anoplopoma fimbria*) inhabit the northern Pacific Ocean in an arc extending from northern Mexico in the east to northern Japan in the west, with highest concentrations occurring in Alaska (Figure 1). In Alaskan waters the range of sablefish extends from the Gulf of Alaska, westward to the Aleutian Islands, and into the Bering Sea (Wolotira *et al*., 1993). Adult sablefish occur along the continental slope, shelf gullies, and in deep fjords, generally at depths greater than 200 m. Sablefish observed from a manned submersible were found on or within 1 m of the bottom (Krieger, 1997). In contrast to the adult distribution, juvenile sablefish (less than 40 cm) spend their first two to three years on the continental shelf of the GOA, and occasionally on the shelf of the southeast Bering Sea. The Bering Sea shelf is utilized significantly in some years and little used during other years (Shotwell, 2007).

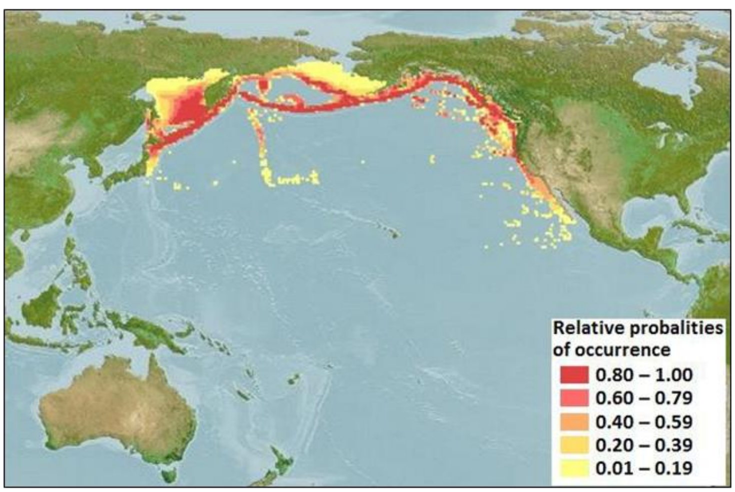

Figure 1. Native distribution map for *Anoplopoma fimbria* (Sablefish), showing the currently known distribution for the species (Source: www.fishbase.org).

Stock structure

Stock assessment scientists have long believed that eastern North Pacific sablefish form two populations based on differences in growth rate, size at maturity, and tagging studies (McDevitt, 1990; Saunders *et al*., 1996; Kimura *et al*., 1998); with a northern population inhabiting Alaska and northern British Columbia (BC) waters and a southern population inhabiting southern BC, Washington, Oregon, and California waters. The two populations are known to mix off waters of southwest Vancouver Island and northwest Washington. However, genetic analyses failed to detect genotypic differentiation in support of the two-population hypothesis with only weak differentiation being found between the northern and southern extremes of the Sablefish range (Tsuyuki and Roberts, 1969; Wishard and Aebersold, 1979; Gharrett *et al*., 1983; Tripp-Valdez *et al*., 2012). Tripp-Valdez *et al*.

(2012) showed that two Sablefish populations are more likely than 1, 3, or more, based on the allele frequencies of the genetic markers; however, statistical power was not high enough to discriminate fish among populations or the approximate geographic boundaries.

The lack of apparent biological population structure probably arises because sablefish are highly mobile at all spatial scales relevant to their life history. As larvae and juveniles, sablefish are transported by surface currents at scales of 10 – 100 km; as juveniles, sablefish make ontogenetic movements from shallow to deep waters over 100s of kms; and adult sablefish may make ocean-basin scale movements up to 1000s of kms. Kimura *et al.* (1998) found that in the long-term approx. 3.5% of Alaskan fish migrate to the west coast and 4.4% of west coast fish migrate to Alaska. Therefore, mixing of members from the putative populations is likely sufficient for sablefish to be considered one biological population (DFO, 2013).

However, despite mixing of sablefish being potentially sufficient for them to be considered one biological population, short term migration rates will be small and justify the separation of these populations for fishery management purposes (Kimura *et al*., 1998). Sablefish are assessed as a single population in Federal waters off Alaska and are managed by discrete regions to distribute exploitation throughout their wide geographical range. Management and regulatory decisions, such as catch limits, seasons, and restrictions, are implemented at the regulatory area level.

Compared to the eastern part of the range the population structure of sablefish in Asian waters is poorly studied. It is believed that western North Pacific sablefish are recruited from the north-eastern Pacific stock (Orlova *et al*., 2014; Kodolov, 1986). However, other authors suggest that replenishment of sablefish off the eastern Kamchatka and the Kuril Islands is not due solely to migration of the adult fish from the Bering Sea along the continental slope. Reasoning includes considerations on the drift of yearlings via the Aleutian current (Dudnik *et al*., 1998) or indeed that Asian waters, including the Okhotsk Sea, may be permanently inhabited by sablefish and constitute an integral part of its North Pacific range (Novikov, 1994) with Orlov and Biryukov (2005) suggesting that sablefish spawning may occur in the area.

Currently, there is no directed fishery for sablefish in Russian waters, so the resource s probably underutilized. Sablefish are only caught as bycatch in redfish (give species name) and halibut fisheries. In 2013, the volume of the recommended catch of sablefish in the Russian Pacific waters was 820 t. While landings figures for 2013 are available according to the official statistics catches of sablefish from 2006 to 2011 ranged from 7 t to 27 t for all areas.

Feeding Ecology (larval stage)

Larval sablefish feed on a variety of small zooplankton ranging from larval copepods (crustaceans) to small amphipods (small, shrimp-like crustaceans). Juveniles feed primarily on macrozooplankton and micronekton. Older juveniles and adults are more opportunistic appearing to be feed on whatever prey is available, ranging from bottom invertebrates to fishes, squid, and jellyfish. During their second year, sablefish live near shore and feed on salmon fry and smolts during the summer months. Likewise, salmon in southeast Alaska are known to feed on young sablefish during the late summer. A major predator for adult sablefish is most likely sperm whales.

Feeding Ecology (Juveniles)

Koutre (2014) found that the composition of juvenile sablefish diets was diverse. In their analysis of 2,662 prey items the author found 48 invertebrate and vertebrate prey taxa were identified. Across all sampling periods, Pacific herring was the dominant prey type by weight (55%), followed by salmonid offal (16%) and smelts (osmerids combined, 7%). Salmonid offal included skin, bones, organs and eggs from moribund salmon and salmon carcasses washed into Saint John Baptize Bay, Southeast Alaska from the inlet creek after spawning. Krill

(Euphausiidae) were the only invertebrate prey group that contributed >1% of the diet by weight (5%). Most of the dominant prey items by % weight also had a high frequency of occurrence in sablefish sampled, with the most frequently occurring taxa being Pacific herring (49%), salmonid offal (14%), and krill (Euphausiidae ,13%).

Early life history

Spawning is pelagic at depths of 300 – 500 m near the edges of the continental slope (Mason *et al*., 1983; McFarlane and Nagata, 1988), with eggs developing at depth and larvae developing near the surface as far offshore as 180 miles (Wing, 1997). Average spawning date in Alaska based on otolith analysis is March 30 (Sigler *et al*., 2001). Along the Canadian coast (Mason *et al*., 1983) and off Southeast Alaska sablefish spawn from January-April with a peak in February. Farther down the coast, off central California, sablefish spawn earlier, from October-February (Hunter *et al*., 1989). Sablefish in spawning condition were also noted as far west as Kamchatka in November and December (Orlov and Biryukov, 2005).

The size of sablefish at 50% maturity off California and Canada is 58-60 cm for females, corresponding to an age of approximately 5 years (Mason *et al*., 1983; Hunter *et al*., 1989). In Alaska, most young-of-the-year sablefish are caught in the central and eastern Gulf of Alaska (GOA) (Sigler *et al*., 2001). Near the end of the first summer, pelagic juveniles less than 20 cm drift inshore and spend the winter and following summer in inshore waters, reaching 30-40 cm by the end of their second summer (Rutecki and Varosi, 1997). After their second summer, they begin moving offshore to deeper water, typically reaching their adult habitat, the upper continental slope at about 4 to 5 years. This corresponds to the age range when sablefish start becoming reproductively viable (Mason *et al*., 1983). Younger fish (age 3-4) inhabit shallower waters on the shelf, while older fish migrate down to the slope. Fish also tend to move counter clockwise through the GOA with age (e.g., Maloney and Sigler, 2008; Heifetz and Fujioka, 1991).

Migration

Federally managed sablefish found in the Bering Sea and in the GOA are considered one population with migration occurring between these regions. In the GOA, small sablefish move westward, and large sablefish move eastward. Consequently, large year classes are first noticed in the westward areas. In Southeast Alaska, the Chatham and Clarence Strait fisheries are considered separate populations; however, tagging studies indicate some movement between Chatham Strait and outside waters and between Clarence Strait and British Colombian waters. The degree of migration between inside and outside waters has not been quantified.

6.1.2 Halibut Biology

Pacific halibut (*Hippoglossus stenolepis*) are the largest flatfish in the Family Pleuronectidae, with some individuals reaching over eight feet in length and over 500 pounds. Female halibut grow faster and reach larger sizes than male halibut with male halibut rarely reaching three feet in length. The scientific name for Pacific halibut was first proposed in 1904 by P.J. Schmidt, a Russian scientist who noted anatomical differences such as scale shape, pectoral fin length, and body shape that distinguished it from the Atlantic halibut (*Hippoglossus hippoglossus*). Like other flatfish Pacific halibut are flattened laterally, and swim sideways, with one side facing down and the other facing up. Halibut larvae start life in an upright position like other fish, with an eye on each side of the head. When the larvae are about one inch long the left eye moves to the right side of the head and the coloration on the left side of the body fades. The fish end up with both eyes on the pigmented (olive to dark brown coloration), or right, or upper side of the body, while their underside is white.

Pacific halibut are typically found over a variety of bottom types at depths of 20 to 1,000 feet on or near the continental shelf throughout much of the northern Pacific Ocean. Their range extends from California northward to the Chukchi Sea, and from the Gulf of Anadyr, Russia southward to Hokkaido, Japan. The management area of the International Pacific Halibut Commission (IPHC) covers the continental shelf from northern California to the Aleutian Islands and throughout the Bering Sea. The eastern north Pacific halibut resource is presently managed under the assumption that a single, fully mixed population exists from California through the eastern Bering Sea. This theory rests largely upon studies that indicate there is northwest larval drift balanced by compensatory migration of juveniles and adults to the southeast, over broad geographic expanses, together with tag recovery data supporting extensive movement of fish (Figure 2).

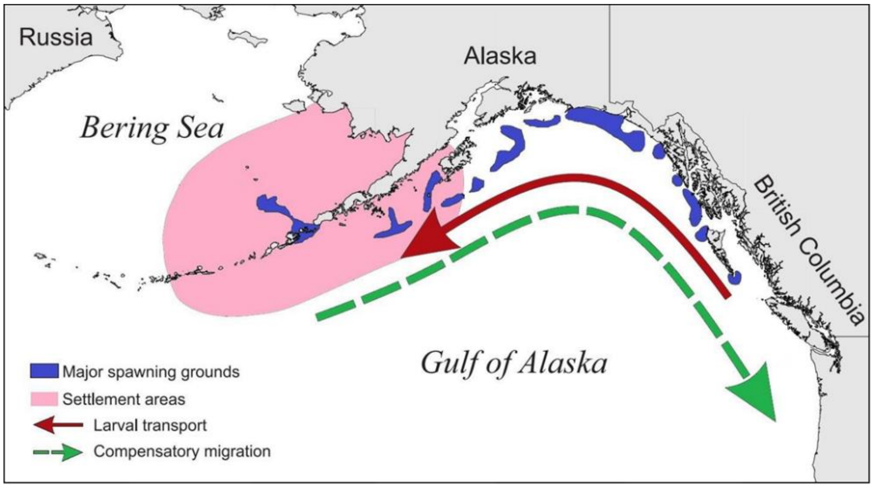

Figure 2. Major spawning and settlement areas for Alaskan Pacific halibut with arrows depicting directions of larval transport and adult compensatory migration (Figure adapted from: http://tinyurl.com/zrxqtyo).

Early Life History

Most male halibut are sexually mature by about 8 years of age, while 50% of the females are mature by about age 12. Halibut spawn annually from November to March, at depths of 300 to 1,500 feet. Pop-up Archival Transmitting tag data have recorded periods where halibut swim up off the bottom and drift back down to the sea floor, repeating this several times. While this behavior is not fully understood, it seems to conform with "spawning rises" witnessed in other flatfish, where females move up into the water column to release eggs while accompanying males fertilize them externally allowing for better egg dispersal. Depending on the size of the fish, female halibut release anywhere from 500,000 eggs for a 50-pound (23 kg) fish to over 4 million for a 250 lb (113 kg) fish.

About 15 days after fertilization, the eggs hatch and the larvae enter a pelagic stage where they are neutrally buoyant and are transported by ocean currents, sustained by their large yolk sac until the early post-larva stage. As the larvae mature, they move higher in the water column and ride the surface currents to shallower, more nourishing coastal waters. In the Gulf of Alaska, the eggs and larvae are carried generally westward with the Alaska Coastal Current and may be transported hundreds of miles from the spawning ground. Six months after hatching, young halibut have developed the characteristics of the adult form and are ready to settle in the shallows of inshore areas (Figure 3).

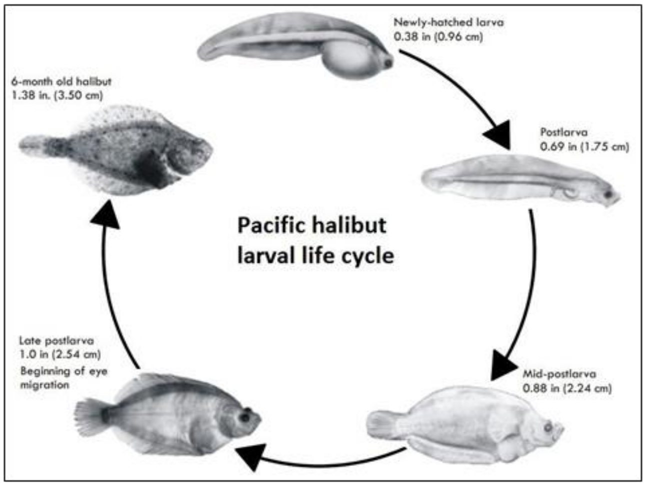

Figure 3. Schematic of the larval stage of Pacific halibut life cycle. (Source: http://tinyurl.com/jmudhqu).

Feeding ecology

During their first-year halibut are planktivorous while halibut from 1 to 3 years old feed on euphausiids (small shrimp-like crustaceans) and small fish. The percentage of the diet occupied by fish increases with size and age with larger Pacific halibut feeding mainly on fish including other abundant or commercially important species such as walleye pollock (*Theragra chalcogramma*), Pacific cod (*Gadus macrocephalus*), saffron cod (*Eleginus gracilis*), Pacific herring (*Clupea pallasi*), Japanese sardine (*Sardinops melanostictus*), capelin (*Mallotus villosus*), Pacific sandlance (*Ammodytes hexapterus*), Atka mackerel (*Pleurogrammus monopterygius*), sandfish (*Trichodon trichodon*), arrowtooth flounder (*Atheresthes stomias*), yellowfin sole (*Limanda aspera*), sculpins (Cottidae), salmon (*Oncorhynchus spp.*), eelpouts (*Lycodes spp.*), snailfishes (*Liparis spp.*). Larger Pacific halibut also feed on various species of crabs, shrimps, squids, and octopi.

Age and Growth

Pacific halibut can be aged by counting the annual pattern of growth rings within the otoliths (ear bones). While the oldest recorded specimens ages of more than 50 years old, most fish found in the fishery are in their teens and early 20s. Pacific halibut females are generally pre-teens (8 to 12 years old) when they reach the minimum size limit (MSL) for the commercial fishery of 32 inches.

Halibut size-at-age has changed over time. For example, the average length and weight of halibut of each age increased from the 1920s to the 1970s and has decreased since then. By the 2000s, 12-year-old halibut were about 75% the length and about 50% of the weight they were in the 1980s. Reasons for changes in size-at-age are unknown. The changes are not thought to be correlated with changes in ocean temperature. Other possible causes suggested include competition with other species, competition among halibut, climate effects on growth or survival, effects of fishing and size limits, changes in how halibut are aged, or combinations of factors.

Migration

Juvenile and some adult halibut migrate generally eastward and southward, into the Gulf of Alaska coastal current, countering the westward drift of eggs and larvae (Figure 4). Halibut tagged in the Bering Sea have been caught as far south as the coast of Oregon, a migration of over 2,000 miles. As a result of the extensive movements of juvenile and adult halibut, the entire eastern Pacific population is treated as a single stock for purposes of assessment. Research is continuing to determine if there are spawning sub-stocks of varying productivity. Halibut also move seasonally between shallow waters and deep waters. Mature fish move to deeper offshore areas in the fall to spawn and return to nearshore feeding areas in early summer. It is not yet clear if fish return to the same areas to spawn or feed year after year.

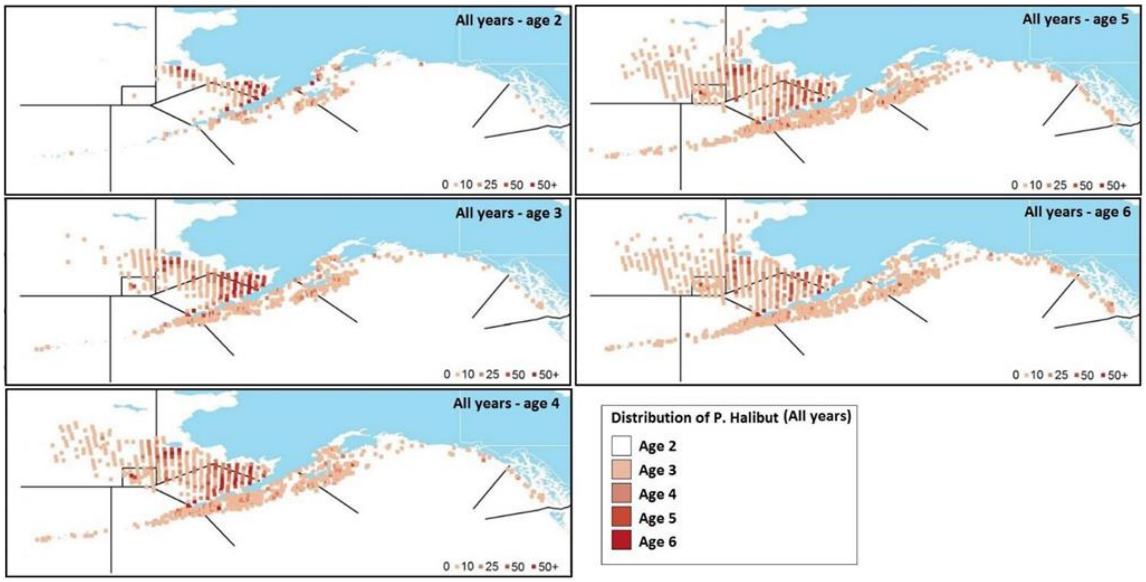

Figure 4. Distribution of halibut at ages 2-6 for all years combined from National Marine Fisheries Service (NMFS) groundfish trawl surveys (Figure adapted from: http://tinyurl.com/zrxqtyo).

6.2 Fishery Location and Method

6.2.1 Sablefish Fishery Location

As previously discussed, sablefish are assessed as a single population in Federal waters off Alaska due to their being highly migratory for at least part of their life (Heifetz and Fujioka, 1991; Maloney and Heifetz, 1997; Kimura *et al.*, 1998; DFO, 2013). Sablefish are managed by discrete regions to distribute exploitation throughout their wide geographical range. Management and regulatory decisions, such as catch limits, seasons, and restrictions, are implemented at the regulatory area level. There are four management areas in the GOA: Western, Central, West Yakutat, and East Yakutat/Southeast Outside (SEO) (Figure 5, left); and two management areas in the Bering Sea and Aleutian Islands (BSAI): the eastern Bering Sea (EBS) and the Aleutian Islands (AI) region (Figure 5, right).

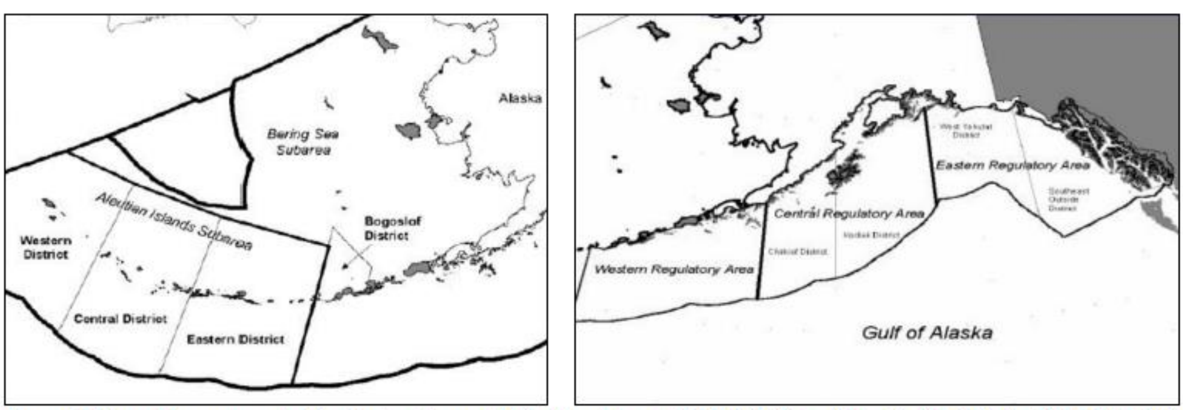

Figure 5. Regulatory areas in the Bering Sea and Aleutian Islands (BSAI) (left) and the Gulf of Alaska (GOA) (right).

Note only those areas within the boundaries of the Alaskan EEZ in the North Pacific (i.e., those outlined in green in Figure 6) are covered in detail in this assessment and only catches from these areas are ultimately eligible for Certification.

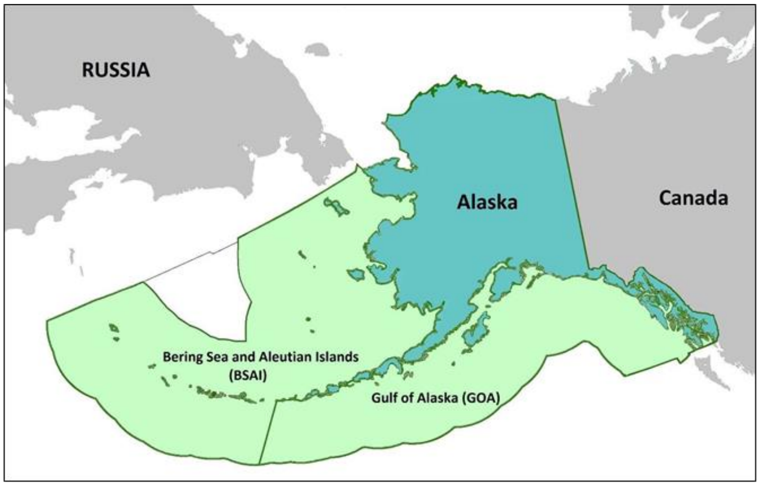

Figure 6. Management Areas within the boundaries of the Alaskan EEZ in the North Pacific that are covered in detail in this assessment, and from which catches eligible for Certification may come.

6.2.2 Halibut Fishery Location

During the mid-1920s, the IPHC, or the International Fisheries Commission (IFC) as it was then known, divided the commercial fishing grounds for halibut into multiple statistical areas intended to be used as convenient analytical units for tabulating and analysing catch, biological, biometric and migration data. Over time the boundaries of the original statistical areas have been revised and added to since their inception for a variety of reasons including the expansion of the fishing grounds, improved understanding of halibut distribution and the need to aggregate data into smaller/more-refined management units. From the originally defined 35 areas, the Commission now recognizes over 100 statistical areas extending from California, north-westward along the North American coastline, to the United States-Russia boundary, including the Bering Sea.

In addition to the statistical areas, the IPHC uses a set of larger regional units called regulatory areas. These regulatory areas are the reported management units used by IPHC. Most data are aggregated at the statistical area level and are then combined to compute statistics at the regulatory area level. Management and regulatory decisions, such as catch limits, seasons, and restrictions, are implemented at the regulatory area level. There are currently ten regulatory areas eight of which are off the coast of Alaska with the other two, Area 2A and 2B located off the coasts of Washington/Oregon and British Columbia, respectively (Figure 7). Note only those areas within the boundaries of the Alaskan EEZ in the North Pacific (i.e., those outlined in green in Figure 8) are covered in detail in this assessment and only catches from these areas are ultimately eligible for Certification. Main landing ports are shown on Figure 9.

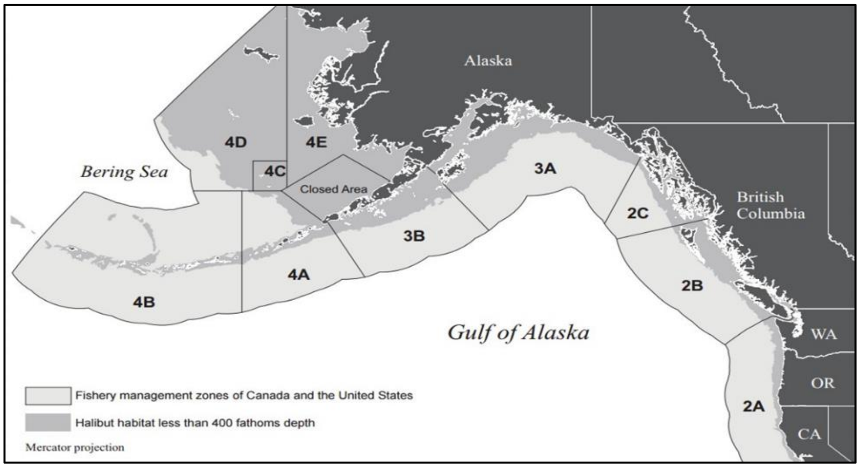

Figure 7. IPHC Regulatory Areas.

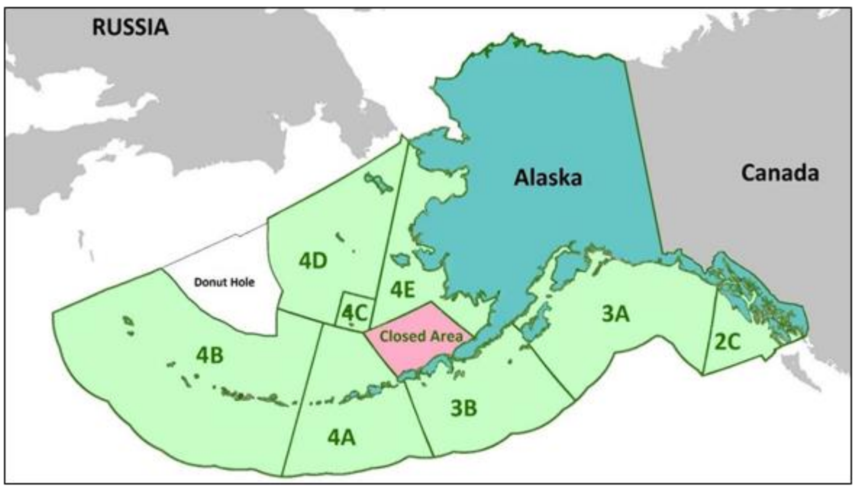

Figure 8. IPHC Regulatory Areas within the boundaries of the Alaskan EEZ in the North Pacific that are covered in detail in this assessment, and from which catches eligible for Certification may come. Note “Closed Area” represents the IPHC Bering Sea Closed Area which is closed to directed halibut fishing (Modified from: http://tinyurl.com/jnclh6r).

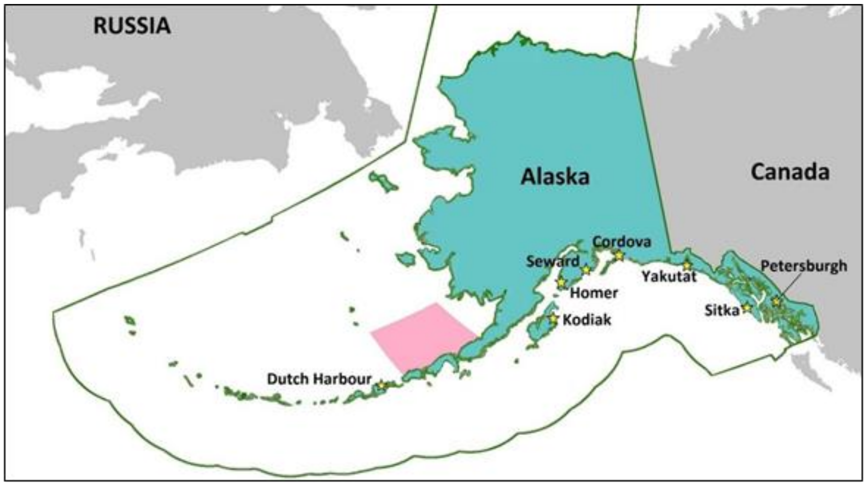

Figure 9. Main landing ports for the Alaskan Pacific halibut IFQ fishery.

6.2.3 Sablefish Fishing Methods

Most of the sablefish catch in Alaska comes from the eastern and central GOA, but the fishery also operates in the western GOA, Bering Sea, and Aleutian Islands. Fixed gear (longlines and pots) harvests approximately 90% of the sablefish quota and trawl gear approximately 10%. Pot fishing is allowed in the BSAI and GOA and accounts for nearly 50% of the Individual Fishing Quota (IFQ) catch in those areas.

Sablefish are caught primarily with longline gear in Alaska); however, the Clarence Strait area has both a season for pot and longline gear. The Aleutian Islands state fishery allows longline, pot, jig, and hand troll gear, and one trawl vessel qualifies for the limited entry program in Prince William Sound. In federal waters, sablefish are primarily caught in directed fisheries on longline gear; however, an increasing trend toward pot gear exists due to whale depredation of sablefish on longline gear. In addition, sablefish are caught as bycatch in trawl fisheries[1].

Longline

Longliners, as vessels that fish with longlines are known, use a long line (“groundline”) that is laid on the seabed to catch demersal species of fish (bottomfish), including halibut, sablefish and lingcod (Figure 10). Attached to the groundline are leaders or gangions with baited hooks. Since the inception of the IFQ system, average set length in the directed fishery for sablefish has been near 9 km and average hook spacing near 1.2 m. The gear is baited by hand or by machine, with smaller boats generally baiting by hand and larger boats generally baiting by machine. Circle hooks are usually used, except for modified J-hooks on some boats with machine baiters. The lines are anchored at each end of each set (skate). Lines at both ends of the set run to the surface and are marked with a buoy and flag. A longline vessel typically sets several lines for a 24-hours soak. The lines are retrieved over a side or stern roller with a power winch and the fish caught are bled and or dressed and then packed in ice in the vessel’s holds. Longliners are typically large vessels, 50 to 100 feet long, with a weather cover on the stern to protect the crew. The sablefish fishery has historically been a small boat fishery with the median vessel length in the 2011 fishery being 56ft. Longlines are coiled and stacked on deck or on the winch, when not in use. Longliners are readily identified by their weather cover and, when not fishing, by the numerous orange buoys and flags that are tied along their rails.

Pots

Pot fishing in the IFQ fishery is currently allowed in the GOA and in the BSAI regions. In 2000, the pot fishery accounted for less than 10% of the fixed gear sablefish catch in these areas, but effort has increased substantially

[1] https://adfg.alaska.gov/index.cfm?adfg=fishresearch.sablefish

in response to killer whale depredation. Pots are deployed tethered together on a single length of cable, with approximately 40 - 135 pots per set. Since 2004, pot gear has accounted for over 50% of the BS fixed gear IFQ catch and up to 34% of the fixed gear catch in the AI. Sablefish pots are large steel-framed cages covered in net mesh. The baited pots are placed on the seafloor where they trap the fish (Figure 10). Fish enter the traps through tunnels but cannot escape. Later the pots are retrieved, and the fish are sorted on deck. Non-target catch is returned to the sea.

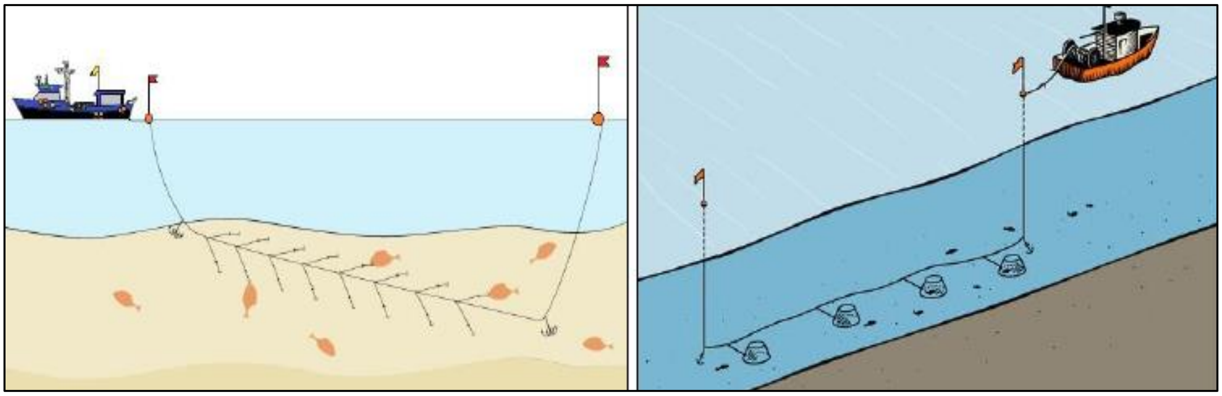

Figure 10. Schematics of a benthic longline (left) and sablefish pots (right) as employed in the Alaskan sablefish commercial fishery

Trawls

Sablefish are caught and legally landed as bycatch during directed trawl fisheries for other species groups such as rockfish and deep-water flatfish under Maximum Retainable Allowances specifications. A trawl is a large, bag-shaped net that is towed by a fishing vessel (Figure 11). Trawlers are generally large boats ranging from 70 feet to over 200 feet in length. The doors, because of the way they are built and rigged to the trawl, keep the mouth of the trawl open as it moves through the water. The headrope is equipped with floats forming the upper opening. The footrope is rigged with weights forming the lower opening. Trawlers use sophisticated ultrasonic devices both for location of fish underwater and for species identification. Tow times can vary but general range from 3 to 5 hours.

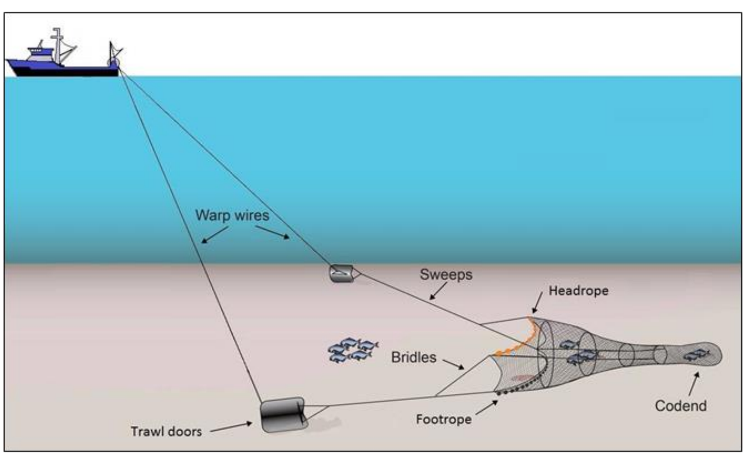

Figure 11. Schematic of a bottom trawl as employed in the Alaskan sablefish commercial fishery.

6.2.4 Halibut Fishing Methods

Halibut are also caught on longline and longline pots in GOA and BSAI. These fishing methods were described above in section 6.2.3. The other fishing method utilized in the AK halibut fisher is by trolling (Figure 12).

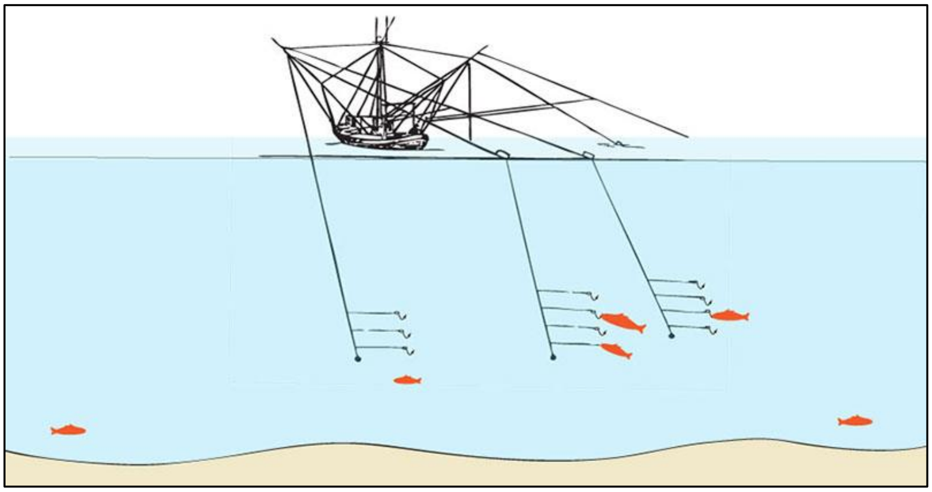

Figure 12. Schematic of troll fishing.

Trolling is a method of fishing where one or more fishing lines, baited with lures or bait fish, are drawn through the water. This may be behind a moving boat, or by slowly winding the line in when fishing from a static position, or even sweeping the line from side-to-side..

6.3 Fishery Management History and Organization

6.3.1 Sablefish Fishery[2]

Early Development

Sablefish have been exploited since the end of the 19th century by U.S. and Canadian fishermen. The North American fishery on sablefish developed as a secondary activity of the halibut fishery. Initial fishing grounds were off Washington and British Columbia and then spread to Oregon, California, and Alaska during the 1920's. Until 1957, the sablefish fishery was exclusively a U.S. and Canadian fishery, ranging from off northern California northward to Kodiak Island in the GOA; catches were relatively small, averaging 1,666 t from 1930 to 1957, and generally limited to areas near fishing ports.

Foreign Fishing

Japanese longliners began operations in the eastern BS in 1958. The fishery expanded rapidly in this area and catches peaked at 25,989 t in 1962. As the fishing grounds in the eastern Bering were pre-empted by expanding Japanese trawl fisheries, the Japanese longline fleet expanded to the AI region and the GOA. In the GOA, sablefish catches increased rapidly, peaking at 36,776 t overall in 1972.

Other foreign nations besides Japan also targeted sablefish. Substantial Soviet Union catches were reported from 1967 - 1973 in the BS. Substantial Korean catches were reported from 1974 - 1983 scattered throughout Alaska. Other countries reporting minor sablefish catches were the Republic of Poland, Taiwan, Mexico, Bulgaria, the Federal Republic of Germany, and Portugal. Heavy fishing by foreign vessels during the 1970's led to a substantial population decline and sharply reduced catches. Catch in the late 1970's was restricted to about one-fifth of the

[2] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/sablefish.pdf

peak catch in 1972, due to the passage of the *Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA,1976)* which restricted fishing from foreign vessels in the US.

U.S. Fishery: 1980 to Present

The U.S. longline fishery began expanding in 1982 in the GOA, and, by 1988, the U.S. harvested all sablefish taken in Alaska, except minor joint venture catches. Following domestication of the fishery, the previously year-round season in the GOA began to shorten.

In 1995, Individual Fishery Quotas (IFQ) were implemented for hook-and-line vessels along with an 8-month season. The IFQ Program issued quota shares to individuals based on sablefish and halibut landings made from 1988 - 1990. Since the implementation of IFQs, the number of longline vessels with sablefish IFQ harvests experienced a substantial anticipated decline from 616 in 1995 to 362 in 2011.

The sablefish fishery has historically been a small boat fishery; the median vessel length in the 2011 fishery was 56 ft. In recent years, approximately 30% of vessels eligible to fish in the IFQ fishery participate in both the halibut and sablefish fisheries and approximately 40% of vessels fish in more than one management area. The season dates have varied by several weeks since 1995, but the monthly pattern has been from March to November with most landings occurring in May - June. The primary gear used for directed sablefish harvest in Alaska is longline gear, which is fished on-bottom. Since the inception of the IFQ system, average set length in the directed fishery for sablefish has been near 9 km and average hook spacing is approximately 1.2 m. Some vessels attach weights to the longline, especially on rough or steep bottom, so that the longline stays in place on bottom.

Pot fishing in the BSAI and GOA (since 2017) IFQ fishery is allowed under regulation. Pot gear use in the BSAI began to increase in 2000 and the average percentage of sablefish caught in pots from 2000 - 2021 in the BSAI was 43% of the fixed gear catch. From 2000 to 2008, catch in pots had increased to 10 - 68% of the fixed gear catch and then decreased to ~30% from 2009 - 2016.

In response to continued sperm whale depredation on hook and line gear, the NPFMC passed a regulation in 2015 to allow pot fishing in the GOA starting in 2017. In 2017 and 2018, pot fishing made up a small proportion of the fixed gear catch (10% and 12%, respectively). The proportion of fixed gear catch in pots in the GOA increased to 24% in 2019 and then again to 47% in 2020. In 2021, the majority of removals by the fixed gear fleet was taken by pot gear (69%). The overall catch in pots in the GOA increased each year from 898 t in 2017 to 7,837 t in 2021, while hook and line catch has decreased from 8,163 t to 3,470 t (as of October 2021).

Five State of Alaska fisheries land sablefish outside the IFQ program; the major State fisheries occur in Prince William Sound, Chatham Strait, and Clarence Strait with minor fisheries in the northern GOA and AI. The minor state fisheries were established by the State of Alaska in 1995, the same time that the Federal Government established the IFQ fishery, primarily to provide open-access fisheries to fishermen who could not participate in the IFQ fishery. Major state fisheries in the NSEI and SSEI are managed and assessed by the ADFG.

Management Measures

A summary of historical catch and management measures pertinent to sablefish in Alaska are shown in Table 7.

Table 7. Summary of management measures with time series of catch, ABC, OFL, and TAC. All values are in tons (Source: NPFMC Bering Sea Aleutian Islands and Gulf of Alaska Sablefish Assessment, December 2021).

Year	Catch	OFL	ABC	TAC	Management measure
1980	10,444			18,000	Amendment 8 to the Gulf of Alaska Fishery Management Plan established the West and East Yakutat management areas for sablefish.
1981	12,604			19,349	None
1982	12,048			17,300	
1983	11,715			14,480	
1984	14,109			14,820	
1985	14,465			13,480	Amendment 14 of the GOA FMP allocated sablefish quota by gear. type: 80% to fixed gear and 20% to trawl gear in WGOA and CGOA and 95% fixed to 5% trawl in the EGOA.
1986	28,892			21,450	Pot fishing banned in Eastern GOA.
1987	35,163			27,700	Pot fishing banned in Central GOA.
1988	38,406		44,200	36,400	None
1989	34,829		37,100	32,200	Pot fishing banned in Western GOA.
1990	32,115		33,400	33,200	Amendment 15 of the BSAI FMP allocated sablefish quota by gear type: 50% to fixed gear in and 50% to trawl in the EBS, and 75% fixed to 25% trawl in the Aleutian Islands.
1991	26,536		28,800	28,800	None
1992	24,042	34,070	25,200	25,200	Pot fishing banned in Bering Sea (57 FR 37906).
1993	25,417	33,250	25,000	25,000	None
1994	23,580	35,860	28,840	28,840	
1995	20,692	25,730	25,300	25,300	Amendment 20 to the Gulf of Alaska Fishery Management Plan and 15 to the Bering Sea/Aleutian Islands Fishery Management Plan established IFQ management for sablefish beginning in 1995. These amendments also allocated 20% of the fixed gear allocation of sablefish to a CDQ reserve for the Bering Sea and Aleutian Islands.
1996	17,393	22,800	19,580	19,380	Pot fishing ban (of 57 FR 37906) repealed in Bering Sea except from June 1-30.
1997	14,607	45,560	17,195	16,820	Maximum retainable allowances for sablefish were revised in the Gulf of Alaska. The percentage depends on the basis species.
1998	13,874	27,840	16,800	16,800	None
1999	13,587	24,700	15,900	15,420	
2000	15,570	21,500	17,230	17,230	
2001	14,065	20,700	16,900	16,900	
2002	14,748	26,100	17,300	17,300	
2003	16,411	28,900	20,890	20,890	
2004	17,520	30,800	23,000	22,550	
2005	16,585	25,400	21,000	21,000	
2006	15,551	25,300	21,000	20,660	
2007	15,958	23,746	20,100	20,100	
2008	14,551	21,310	18,030	18,030	Pot fishing ban repealed in Bering Sea for June 1-30 (74 FR 28733).
2009	13,062	19,000	16,080	16,080	None
2010	11,936	18,030	15,230	15,230	
2011	12,996	18,950	16,040	16,040	
2012	13,875	20,400	17,240	17,240	
2013	13,667	19,180	16,230	16,230	
2014	11,581	16,225	13,722	13,722	

Year	Catch	OFL	ABC	TAC	Management measure
2015	10,982	16,128	13,657	13,657	NPFMC passes Amendment 101 to allow pot fishing in the GOA
2016	10,231	13,396	11,795	11,795	Whale depredation accounted for in survey and fishery
2017	12,270	15,428	13,083	13,083	Pot fishing begins in the GOA
2018	14,265	29,507	14,957	14,957	None
2019	16,565	32,798	15,068	15,068	None
2020	19,005	50,481	22,009	18,293	TAC smaller than ABC based on AP recommendation. OFL changed to Alaska-wide
2021[a]	17,463	60,426	29,588	26,104	None

Note (a): Catch is as of 25th October 2021. Source: www.akfin.org.

6.3.2 Pacific Halibut Fishery[3]

Early Developments

The Commission began its management of the Pacific halibut resource in 1924 with a three-month winter closure to fishing. By 1932, further measures were needed, and the first catch limit was set. Over the next two decades, the fleet grew, and the fishers became more skilled, resulting in progressively shorter seasons to avoid exceeding the catch limit. By 1953, with season length being less than two months, the Convention was modified to allow the setting of seasons by area. Industry again established a voluntary program in 1956 which included eight-day lay-ups, and these management tools together were sufficient through the early 1970s. An increasing number of vessels entered the halibut fishery in the 1970s, leading to a breakdown in the lay-up program, and in 1977 it was discontinued. Because seasons were so short, the Commission began setting multiple seasons for each area and year in an effort to spread the catch over a longer period of time.

Extended Jurisdiction and Regional Councils

The U.S. MSFCMA and the Canadian Coastal Fisheries Protection Act extended each country's fishery jurisdiction to 200 nautical miles (370 km) from shore beginning in 1977. In 1979, the Protocol to the Convention of 1953 signed by the two countries brought an end to U.S. fishing in Canadian waters in 1979 and Canadian fishing in U.S. waters in 1981. The Protocol also enabled the individual governments to make regulations pertaining to their own fleets as long as they were not in conflict with Commission regulations.

The U.S. regional councils - the NPFMC in Alaska and the PFMC on the west coast - were given the authority in 1982 to establish limited access regulations, and authority to allocate catches among user groups was given to the Councils in 1987. However, because of the controversy surrounding limited access, it would take several more years to establish a limited access fishery in Alaska.

In 1987 the Commission used fishing period catch trip limits for the first time, which restricted the maximum pounds landed per vessel during a fishing period. By 1994, season length was as short as 24 hours in the Gulf of Alaska, 12 hours in some parts of the Bering Sea, and 10 hours on the U.S. west coast. Fishing periods catch trip limits were widely used in clean-up fisheries and in some cases were needed during the first fishing period as well. The situation was rectified when an individual quota system was implemented for Alaska by the U.S. government in 1995, putting an end to the derby-style fishery in Alaskan waters.

Directed Fishery

The Commission is responsible for the health of the Pacific halibut resource and engages in basic scientific research, fishery-dependent and fishery-independent sampling, as well as quantitative analyses to support management decisions. These scientific results are provided annually to the Commissioners and stakeholders for

[3] https://www.iphc.int/uploads/pdf/tech0059.pdf

decision-making during the Annual Meeting process. The process relies on several key steps: 1) the annual stock assessment integrates available data into a statistical framework which produces coastwide stock estimates and a decision table-based risk assessment; 2) coastwide stock estimates are apportioned by regulatory area; 3) the current harvest policy is applied to these area-specific estimates to produce yield estimates; and 4) these estimates, in-addition to the coastwide risk assessment and input from stakeholder groups are used by the Commissioners to set annual catch levels for the upcoming year. All allocative responsibility, including implementation of the individual quota systems and construction of the catch sharing plan formulas, falls under the jurisdiction of the individual national governments.

The U.S. Pacific halibut commercial fishing fleet is diverse, using various strategies to harvest the resource. As noted, both the U.S. and Canadian federal fisheries agencies have implemented individual quota (IQ) systems in Alaska and British Columbia, which enables a vessel to fish anytime during an extended season, and thus use the market to their advantage. The mechanics of capturing, cleaning, and storing halibut at sea in the commercial fishery have changed little over time. However, technological advances, steel-hulled vessels, modern electronics, and improved gear (particularly circle hooks and stronger fishing lines), have introduced several technological efficiencies into the fishing operations and has allowed the fishing fleet to capture Pacific halibut throughout the entire extent of their geographic and depth distribution. Many vessels now have refrigeration (since around 19xx) that reduces the amount of ice needed and maintains a lower and more uniform temperature in the hold, thus also improving product quality. Some vessels have refrigerated sea water or an ice/seawater mixture in which to store the fish.

Bycatch Management

Since 1990, halibut bycatch management of U.S. domestic groundfish fisheries in Alaska has principally been conducted through the use of limits to the annual amount of halibut bycatch mortality. The limits are specific to specified target fisheries or fishery groups. The limits are divided among seasons and subareas within the Bering Sea and the Gulf of Alaska. Once a limit is reached, all groundfish fishing by that fishery ceases for the remainder of the year. Most fisheries have limits which are split among seasons to better spread the catch over the year . Gear restrictions are another tool used to help make sure that bycatch does not become excessive.

Stock Assessment

The primary data upon which stock abundance and trend are estimated are collected during the annual research setline survey conducted by the IPHC. The current design, used since 1998, covers a broad spatial extent, spanning the continental shelf area from northern California to the Bering Sea and Aleutian Islands. The annual stock assessment integrates observed data from the commercial fishery and the setline survey, along with the current understanding of biological processes such as maturity, natural mortality, and growth, in order to estimate the relative trend and abundance level of the resource.

Primary information used in the stock assessment is derived from the absolute number of removals from each source, including the directed commercial fishery, sport, and personal use/subsistence harvests, as well as mortality from bycatch. Given removals from the stock, the assessment incorporates trend information from the fishery-independent setline survey as well as the catch rates reported in fishery reported commercial fishery logbooks. Detailed information on the size and age of the survey and fishery catches provides an ability to estimate the demographics of the stock and how these relate to the observed trends. A statistical computer model is used to make predictions, which are compared to the observed data.

Regulatory Measures

The 1923 Convention launched the process of halibut stock management. The Commission holds its Annual Meeting each January to set catch limits, fishing seasons, and to adopt other regulatory recommendations. During that meeting, the staff reports on the previous year's commercial fishery and research survey. Results from the stock assessment and apportionment analyses, as well as any updated information on harvest policy and other ongoing research, are also presented. The industry advisory boards meet concurrently with the Commission and present their recommendations for catch limits, seasons, and other regulatory issues. Although the Commission has the authority to establish policy on conservation matters, it has no direct enforcement authority and cannot allocate fish among users. Instead, the individual governments enforce the regulations and set allocative policy. The regulations are enforced by the NMFS, the Coast Guard, and the state police in the U.S.

6.4 Stock Assessment Activities

Pacific Sablefish

The sablefish assessment model is an age-structured model that extends from earlier statistical catch-at-age (SCAA) models developed by Kimura (1990) and Sigler (1999), which arise from the work by Fournier and Archibald (1982). The model tracks population numbers-at-age by sex. The current configuration was reviewed and recommended by the Groundfish Plan Team in September 2021, then reviewed by the North Pacific Fishery Management Council (NPFC), Scientific and Statistical Committee (SSC) in October 2021. The model is coded in the AD Model Builder software, a C++ based software for development and fitting of general nonlinear statistical models (Fournier *et al*., 2012). The model assumed a single Alaska-wide stock. Recruitment at age-2 is estimated as yearly deviations from the time series average recruitment value. Initial age structure in 1960 is derived based on estimated recruit deviations for each cohort in the initial age structure, which are then decremented based on natural mortality and the historic proportion of fixed gear fishing mortality up until the model start year. Primary demographic parameters are estimated outside the model and treated as fixed inputs, including maturity-, length-, and weight-at-age. Natural mortality is estimated as a time- and age-invariant parameter with a moderately informative prior. The model assumes two primary fishing fleets (i.e., the directed fixed gear fishery and the combined trawl gear fisheries) with independent dynamics, each of which is assumed to operate homogenously across the entire model domain. The separability assumption is utilized to model fishing mortality for each fishing fleet, where a yearly fishing mortality multiplier is estimated along with an age-based selectivity function (i.e., the fixed gear fishery assumes asymptotic selectivity, whereas the trawl fishery assumes dome-shaped selectivity). Three fishery-independent surveys (i.e., the cooperative longline, domestic longline, and domestic Gulf of Alaska trawl) are also modelled along with two fishery-dependent CPUE indices (i.e., historic Japanese longline and domestic longline). The model predicts and directly fits observations for a variety of data sources, including: fixed gear and trawl catch (including discards assuming 100% mortality), separated by fleet; historic Japanese longline CPUE in weight; domestic longline fishery CPUE in weight; cooperative longline survey relative population numbers; domestic longline survey relative population numbers; domestic trawl survey biomass; age frequency compositions for the fixed gear fishing fleet, cooperative longline survey, and domestic longline survey; and length frequency compositions for the fixed gear fishery, trawl fishery, cooperative longline survey, domestic longline survey, and trawl survey. Parameter estimation is handled through a statistical maximum likelihood estimation (MLE) framework by fitting (i.e., minimizing the differences between) the observed and predicted data sets. Stock status is determined through internal estimation of management reference points (e.g., F40% and B40%), while projections of future catch limits (e.g., ABC and OFL) are handled externally and described in the Harvest Recommendations section.

Pacific Halibut

The International Pacific Halibut Commission conducts an annual stock assessment using data from the Fishery-Independent Setline Survey (FISS), the commercial Pacific halibut and other fisheries, as well biological information from its research program. The assessment includes the Pacific halibut resource in the IPHC Convention Area, covering the Exclusive Economic Zones of Canada and the United States of America. Data sources are updated each year to reflect the most recent scientific information available for use in management decision making. The stock assessment is implemented using the generalized Stock Synthesis software (Methot and Wetzel, 2013). Stock Synthesis (SS) is an integrated statistical catch-at-age model (SCAA) that is widely used for stock assessments in the United States and throughout the world. SCAA models consist of three modules: the population dynamics module, an observation module, and a likelihood function. Each of the modules is closely linked. Stock synthesis uses input biological parameters (e.g., growth, maturity, and natural mortality) to propagate abundance and biomass forward from initial conditions (population dynamics model) and develops predicted data sets based on estimates of fishing mortality, selectivity, and catchability (the observation model). Finally, the observed and predicted data are compared (the likelihood module) to determine best-fit parameter estimates using a statistical maximum likelihood framework (see Methot and Wetzel, 2013 for a description of equations and complete modeling framework). SS takes relatively unprocessed input data and incorporates many of the important processes (mortality, selectivity, growth, etc.) that operate in conjunction to produce observed catch, size and age composition and CPUE indices. In addition, SS can incorporate time series of environmental data. Because many of these inputs are correlated, the concept behind SS is that these processes should be modeled together, which helps to ensure that uncertainties in the input data are properly accounted for in the assessment. SS has the ability to incorporate an early, data poor time period for which only catch data are available and a more recent, data-rich time-period for which indices of abundance and length and age-length or age composition observations are available.

The analysis consists of an ensemble of four equally weighted models: two long time-series models, reconstructing historical dynamics back to the beginning of the modern fishery, and two short time-series models incorporating data only from 1992 to the present, a time-period for which estimates of all sources of mortality and survey indices are available for all regions. For each length time-series, there are two models: one fitting to coastwide aggregate data, and one fitting to data disaggregated into the four geographic regions. This combination of models includes uncertainty in the form of alternative hypotheses about several important axes of uncertainty, including: natural mortality rates (estimated in all models except the short coastwide time-series model), environmental effects on recruitment (estimated in the long time-series models), and other model parameters. Results are based on the approximate probability distributions derived from the ensemble of models, thereby incorporating the uncertainty within each model as well as the uncertainty among models.

6.5 Historic Biomass and Removals in the Fishery Trends

Pacific Sablefish

Annual catches in Alaska averaged about 1,700 t from 1930 to 1957 and exploitation rates remained low until Japanese vessels began fishing for sablefish in the BS in 1958 and the GOA in 1963. Catches rapidly increased during the mid-1960s. Annual catches in Alaska reached peaks in 1962, 1972, and 1988. The 1972 catch was the all-time high, at 53,080 t, and the 1962 and 1988 catches were 50% and 72% of the 1972 catch. Evidence of declining stock abundance and passage of the Magnuson Stevens Fishery Conservation and Management Act (MSFCMA) led to significant fishery restrictions from 1978 to 1985, and total catches were reduced substantially. Exceptional recruitment led to increased abundance and increased catches during the late 1980s, which coincided with the domestic fishery expansion; simultaneous with implementation of MSFMA in 1976. Catches declined during the 1990s, increased in the early 2000s, and then declined to near 12,000 t in 2016. In the last five years, catches have continually increased to around 19,000 t in 2020, which is on par with removals from the mid-2000s. Removals in 2021 are expected to be slightly higher than 2020, though current removals, 17,463 t (as of October 25, 2021), remain slightly below the 2020 value. Although increasing catch over the previous five years was associated with increasing trawl removals, directed fixed gear catch increased in 2021 whereas trawl removals decreased for the first time since 2014.

Pacific Halibut

From 1981 to the present, these landings are fully delineated by IPHC Regulatory Area (including all of Areas 4A-4CDE). Coastwide fishery landings increased from 2014-17, the first increases since 2003, then generally decreased to 2020 (the lowest in the last 40 years) in response to reduced mortality limits. The landings in 2021 and 2022 have again increased back to levels approaching those in 2017, due to higher adopted mortality limits. Prior to 1981, only aggregated landings for IPHC Regulatory Areas 4A-4CDE are available; landings from 1935-80 are not currently included in the IPHC's database. Although historical summaries, tables published in technical reports, and other IPHC documents are generally in agreement, the raw data are not able to be reprocessed directly, and therefore the landings estimates prior to 1981 are more uncertain than those after 1981. Historical landings prior to 1935 were reconstructed within current IPHC Regulatory Areas from summaries by historical statistical areas (Bell *et al*., 1952). Reported industrial landings of Pacific halibut begin in 1888; however, already over one million pounds were being landed per year, and there are historical records of substantial tribal fisheries prior to that time. The reconstruction by IPHC Regulatory Area of total landings included some use of ratios between Areas 2A and 2B among adjacent years for ambiguous records (both nations were fishing the same fishing grounds); therefore, the area-specific distributions are more uncertain than the corresponding totals. Reconstructed landing estimates from 1888, as well as other historical time series, are available on the IPHC's website. Several patterns emerge from the longer time series of landings including: the period of substantially reduced fishing in the 1970s in all areas, and the sequential exploitation of biological Regions 2, 3, and 4 over the entire time series.

6.6 Economic Value of the Fishery

6.6.1 Alaska Seafood Marketing Institute

A January 2022 report prepared by the McKinley Research Group for the Alaska Seafood Marketing Institute (ASMI) represents an updated analysis of the economic impact of Alaska's commercial seafood industry at the regional, state-wide, and national levels.[4] Previous reports were completed in 2013, 2015, 2017 and 2020 where, to reduce the effect of year-to-year seafood harvest volatility, most economic impact figures were averaged from the two most recent years. The 2022 report includes both 2019 and 2020 data where applicable but uses 2019 alone as the base year for economic impact numbers since it was felt that averaging 2019 data with the pandemic-disrupted 2020 season would not produce meaningful measures of the seafood industry's economic impact in Alaska.

The report considers only the commercial seafood industry and does not address economic impacts stemming from recreational, charter, or subsistence uses of Alaska's seafood resources.

Seafood Industry 2019

In 2019, more than 62,200 workers were directly employed in Alaska's seafood industry, earning $1.75 billion in total labor income. An estimated 37,400 full-time equivalent jobs were supported in the state with wages of $2.2 billion, including multiplier impacts that result from the industry circulating money in Alaska's economy.

Alaska commercial fisheries employed just over 31,000 fishermen with total labor income of just over $1.0 billion. Seafood processors employed 27,000 workers in 2019. The industry includes 8,900 fishing vessels, 160 shore-based plants, 52 catcher-processor vessels, and about 30 floating processors, among other participants.

[4] https://www.alaskaseafood.org/wp-content/uploads/MRG_ASMI-Economic-Impacts-Report_final.pdf

The seafood industry contributed $5.7 billion in economic output to Alaska's economy in 2019 (Table 8). This measurement includes all the economic activity supported by harvesting, processing, and support sectors.

Table 8. Seafood Industry Impact on Alaska's Economy in 2019 (Source: ASMI).

Direct Impacts	Number of Workers	Labor Income
Commercial Fishing	31,300	$1.01B
Processing	27,100	$495M
Management/ Hatcheries/Other	3,800	$239M
Total	62,200	$1.75B

- Approximately 5.7 billion pounds of seafood worth $2.0 billion was harvested in 2019. Processors turned this harvest into 2.8 billion pounds of product worth $4.7 billion.
- Alaska seafood was sold in 100 countries around the world in 2019. Export markets typically account for approximately two-thirds of sales value, while the U.S. market buys the remaining one-third.
- Seafood directly employs more workers than any other private sector industry in Alaska and is the economic foundation of many rural communities.
- A commitment to sustainable management has allowed the state's fisheries to produce large, diversified harvests for many decades.

National Economic Impact of Alaska's Seafood Industry

- Nationally, the Alaska seafood industry creates over 100,000 FTE jobs, $6 billion in annual labor income, and $15 billion in economic output.
- The national economic impact of Alaska's seafood industry includes $6.4 billion in direct output associated with fishing, processing, distribution, and retail. It also includes $8.6 billion in multiplier effects generated as the industry's direct output circulates throughout the U.S. economy.
- Alaska produces two-thirds of the nation's seafood harvest in a typical year and is home to nine of the top 20 U.S. fishing ports by value and eight of the top 20 by volume.
- Just under 1 million metric tons (2.2 billion pounds) of Alaska seafood was exported in 2019, bringing $3 billion in new money from foreign buyers into the U.S. economy each year.

Commercial Fishing Sector

The scale of commercial fishing activity in Alaska is very diverse (Table 9). Crews range from one or two fishermen working from skiffs and small boats to large catcher-processors in excess of 300 feet with 100 workers or more. Fishermen involvement in the industry also spans a wide spectrum. Many skippers and crew participate in multiple fisheries as a full-time career, while others fish to supplement income from other jobs, earn money during a summer school break, or work as crew members for friends and family to be part of a uniquely Alaskan cultural tradition.

Table 9. Key Commercial Sector Figures - 2019 and 2020 (Source: ASMI). Note (a): includes COVID-19 impacts.

Key Factors	2019	2020 [a]
Skippers & Crew	31,300	24,200
Skippers	8,800	7,700
Crew	22,500	16,500
Percent Alaska Residents	63%	57%
Fishing and Related Vessels	8,900	8,500
Ex-Vessel Value ($millions)	$1,988	$1,457
Percent to Alaska Residents	39%	37%
Harvest Volume (millions pounds)	5,658	5,056

Seafood Processing Sector

Seafood is the state's largest international export by volume and value and is also the largest manufacturing sector in Alaska, accounting for 70% of the state's manufacturing employment in 2019 (Table 10 and Table 11). The seasonality of many Alaska fisheries, especially salmon, result in a reliance on non-resident workers to fully staff production jobs at remote sites across the state. Though non-residents comprise approximately 70% of the processing workforce, residents earn a higher share of the sector's income as they are more likely to be employed in management and maintenance positions and work in areas with longer operating seasons.

More than 40 different occupations are supported by the processing sector, including machinists, engineers, electricians, cooks, and laborers, among many others. The sector includes 160 shore-based plants, 52 catcher-processors, approximately 30 floating processors, and various other participants.

Table 10. Key Alaska Workforce Indicators - 2019 and 2020 (Source: ASMI).

Workforce	2019	2020 [b]
Peak Monthly Emp.	20,244	15,954
Avg. Monthly Emp.	9,095	8,114
Total Worker Count	27,100	23,700
Alaska Residents	6,568	4,958
Total Earnings	$491 million	$457 million
Alaska Residents	$162 million	$140 million

Note (b): includes COVID-19 impacts.

Table 11. State Value Added for 2019 and 2020 (Source: ASMI).

Value Added	2019	2020 [c]
Ex-Vessel Value	$1.99 billion	$1.46 billion
First Wholesale Value	$4.67 billion	$3.67 billion
Value Added by	$2.68 billion	$2.21 billion

First Wholesale Value by product type (2019) includes:

- Head/Gutted and Whole Fish - 38%
- Fillets - 22%
- Surimi - 13%
- Roe - 8%
- Canned - 7%
- Meal and Oil - 3%
- Other - 8%

First Wholesale by Species (2019) includes:

- Salmon - 37%
- Pollock - 35%
- Pacific Cod - 8%
- Flatfish, Rockfish, Mackerel - 8%
- Halibut and Sablefish - 4%
- Crab - 6%
- Other - 1%

Statewide Economic Impacts

- Seafood contributed an annual average of $5.7 billion in economic output to the Alaska economy in 2019 (Table 12).
- The seafood industry directly employed 62,200 workers in Alaska in 2019. After adjusting for part-time and seasonal jobs, this amounts to 26,900 full-time equivalent (FTE) positions. Through multiplier effects associated with business and household spending, it is estimated the industry created an additional 10,600 FTE jobs and $466 million in labor income.
- In total, seafood contributed 37,400 FTE jobs and $2.2 billion of labor income to the state's economy in 2019. It is estimated that the commercial seafood industry accounted for about 10% of employment in Alaska during this period.
- The seafood industry directly employs more workers than any other private sector industry. Including multiplier effects, it is the second-largest basic sector creator of labor income in Alaska after the oil-and-gas industry.
- The economic benefits of the seafood industry are broadly distributed across Alaska, from Kotzebue to Ketchikan - including an estimated 26,400 Alaska residents directly employed in the industry in 2019.

Table 12. Seafood Industry Impact on Alaska's Economy, 2019 (Source: ASMI).

	Number of Workers	FTE Jobs	Labor Income ($millions)	Output ($millions)
Commercial Fishing	31,300	13,400	$1,011	$1,988
Processing	27,100	11,100	$495	$2,682
Mgmt./Other	3,800	2,400	$239	-
Direct Total	**62,200**	**26,900**	**$1,745**	**$4,670**
Secondary Total	**-**	**10,500**	**$466**	**$1,014**
Total Impacts	**-**	**37,400**	**$2,211**	**$5,685**

Table 13. Economic Trends in Alaska's Seafood Industry - 2014 to 2020 (Source: ASMI).

	2014	2015	2016	2017	2018	2019	2020 [d]
Resident Commercial Fishermen	17,785	17,794	17,361	18,435	18,549	19,808	13,886
Gross Earnings ($millions)	$741	$677	$632	$827	$716	$636	$430
Average Processing Employment*	10,596	10,254	9,814	9,434	8,808	9,095	8,114
Peak Processing Employment*	20,788	21,279	21,048	19,940	19,571	20,244	15,954
Wages & Salaries ($millions)*	$399	$445	$442	$446	$439	$471	$439
Harvest Value ($millions)	$1,920	$1,783	$1,741	$2,035	$1,964	$1,988	$1,457
First Wholesale Value ($millions)	$4,291	$4,273	$4,198	$4,851	$4,479	$4,669	$3,666

Note (d): includes COVID-19 impacts.

Note (*): Figures may not include processing activity from all catcher/processor vessels

National Impact of Alaska Seafood

- The national economic impact of Alaska's seafood industry includes an estimated 50,600 FTE jobs in fishing, processing, fisheries management, transportation and distribution, and in stores and restaurants. It also includes 51,800 secondary jobs throughout the economy created as a result of spending by businesses in the supply chain and their employees (Table 14).

- Among all the participants in the national seafood supply chain, fishermen earn the largest share of labor income at $1.0 billion, or about 40% of all direct labor income generated by Alaska's seafood industry.
- In 2019 Alaska's seafood industry supported an estimated 102,400 FTE jobs in the U.S. Workers in these jobs earned an estimated $6.1 billion in total annual labor income. An estimated 63% of the industry's skippers, active permit owners, and crew were Alaska residents, a total of 19,808 fishermen. For many rural Alaska communities, the seafood industry is among the largest source of employment, wages, and tax revenue.
- U.S economic output related to Alaska's seafood industry totals $15 billion including all direct and multiplier impacts. Total output is defined as the value of Alaska's seafood resource, as it moves from the fishing vessel to the consumer's plate, plus output arising from secondary impacts.
- The U.S. Department of Agriculture purchased $120 million in Alaska seafood products in Fiscal Year 2019 - the largest annual Alaska seafood purchase on record.

Table 14. National Impact of Alaska Seafood - 2019 (Source: ASMI).

	Number of Workers	FTE Jobs	Labor Income ($millions)	Output ($millions)
Commercial Fishing	31,300	13,400	1,011	1,988
Processing	31,100	15,200	$582	$2,682
Mgmt./Other	4,800	3,000	$323	-
Distributors	800	800	$100	$200
Grocers	4,700	4,700	$150	$400
Restaurants	13,500	13,500	$440	$1,100
Direct Total	**86,200**	**50,600**	**$2,606**	**$6,370**
Secondary Total	**-**	**51,800**	**$3,474**	**$8,638**
Total Impacts	**-**	**102,400**	**$6,080**	**$15,008**

6.6.2 International Pacific Halibut Commission

In seeking the most current information of the economic importance of the Pacific Halibut commercial fishery in Alaska (state territorial and EEZ waters), the team sought out reports prepared by or on behalf of the IPHC. Previous studies have examined aspects of the economic impact of the Pacific halibut fishery, and there is regular reporting of fishery-related economic data by agencies of both Canada and the USA. However, the total picture of the economic impact of the Pacific halibut fishery is incomplete.[5]

Not all sectors of the fishery have been examined together in a comprehensive way and most of the direct economic data do not reach beyond the ex-vessel or wholesale price level. In addition, the value of the community, social, and cultural impacts of the fishery have generally not been assessed. As a result, the Commission and other policy makers are unable to meaningfully compare the economic and social impact of the different sectors of the Pacific halibut fishery to each other, to other fisheries, to other communities, or to other industries.

A project proposal was written in 2019 with specific objectives and deliverables and approved the same year during AM095. A 60-page project report titled: *Pacific Halibut Multiregional Economic Impact Assessment* was prepared by the Commission's Secretariat and posted on 20th January 2022.[6] It is said that the report is a core product of the IPHC socioeconomic study that directly responds to the Commission's "desire for more comprehensive economic information to support the overall management of the Pacific halibut resource in fulfilment of its mandate."

[5] https://www.iphc.int/uploads/pdf/economics/2021/iphc-2019-fac095.pdf
[6] https://www.iphc.int/uploads/pdf/economics/2022/iphc-2022-econ-01.pdf

The PHMEIA model results focus on the magnitude of the Pacific halibut contribution to the economy and its spatial distribution. To increase confidence in the PHMEIA results, the IPHC believes the model needs to consider sources of input variations and the cumulative effect of interactions among them. The Commission's opines that the natural next step is to conduct sensitivity analysis to account for the uncertainties in the system. The current framework would benefit from proposing methods for calculating the range (confidence intervals) of impacts from input variations within a PHMEIA framework, explicitly accounting for multiple sources of input variations.

Notwithstanding the above, the IPHC does generate reports about the Pacific halibut markets and the formation of the price paid for Pacific halibut products by final consumers (end-users). The most recent report (IPHC-2022-AM098-INF05 Rev_1) was published in January 2022.[7]

Processing and Primary Wholesale

The total wholesale value of Pacific halibut products processed by Alaska and British Columbia in 2019 was about $165.3 million (USD) of which Alaska accounted for 66%. The covid-19 pandemic had a considerable impact on the 2020 output of the processing sector in Alaska. The state noted a 28% year-on-year drop in wholesale value, from $108.6 million in 2019 to $78.3 million in 2020. However, the 2021 season was marked by a prompt recovery, with wholesale prices continuing an upward trend throughout the year. The main Pacific halibut product of Alaska is headed and gutted (H&G) fish. It accounted for 65% of 2019 Alaska production.

Retail Market and Services

Pacific halibut is most commonly sold in the form of fillets (portions, 4 - 8oz each), but one can also find Pacific halibut steaks and halibut cheeks. Some retailers also sell fish whole. In 2021, fresh Alaskan Pacific halibut fillets routinely sold for USD $24 - 28/lb. Less harvest activity in 2020 had repercussions in the economy beyond the harvest sector as it also affected harvest sector suppliers and downstream industries that rely on its output. Outbreaks of covid-19 in fish processing plants affected economic activity generated regionally by this directly related to the Pacific halibut supply sector. Moreover, seafood processors incurred additional costs related to protective gear, testing, and quarantine accommodations, and these costs were passed on to consumers.

Pacific halibut longline fisheries in the Bering Sea off Alaska are certified by the Marine Stewardship Council (MSC). Sustainable production certification, such as the one offered by the MSC, typically adds about 15%, and up to 30% depending on fishery, premium to the product price. Alaska's Pacific halibut catch is also certified through the Responsible Fisheries Management (RFM) certification program, which is aligned with the FAO Code of Conduct for Responsible Fisheries.

Overall, it is estimated that the total value-added activity related to Pacific halibut products added up to USD $230 million in the U.S. The total consumer expenditures on Pacific halibut products in the U.S. are assessed at USD $460 million.

6.6.3 NOAA Economics and Social Sciences Research Program

The Program publishes annual Stock Assessment and Fishery Evaluation (SAFE) Reports for the Groundfish fisheries of the *Gulf of Alaska and Bering Sea/Aleutian Islands Area - Economic Status of the Groundfish Fisheries off Alaska, 2020.*[8] The most recent report was published in January 2022.

The report presents the economic status of groundfish fisheries off Alaska in terms of economic activity and outputs using estimates of catch, discards, prohibited-species catch, ex-vessel prices and value (i.e., revenue),

[7] https://www.iphc.int/uploads/pdf/am/am098/iphc-2022-am098-inf05.pdf
[8] https://media.fisheries.noaa.gov/2022-04/Groundfish%20SAFE%202020.pdf

effort (as measured by the size and level of activity of the groundfish fleet), and the first wholesale production volume and gross value of processed products (i.e., F.O.B. Alaska revenue).

The **ex-vessel market** is the transaction of catch delivered by vessels to processors. In general, ex-vessel prices are derived from Commercial Operator Annual Report (COAR) buying reports. Some catcher-vessels minimally process (e.g., head-and-gut) the catch prior to delivery to the processor. The value of this on-board processing is discounted from the ex-vessel price so that it represents the round-weight (unprocessed) prices of the retained catch. **Ex-vessel value** is calculated by multiplying ex-vessel prices by retained catch.

- Financial revenues 2020 for sablefish catcher vessels and catcher processors totalled $4.9 million in the BSAI, $45.9 million in the GOA and $50.8 million statewide. These revenue levels were the lowest of the 5-year period (2016-2020).

The **first wholesale market** is the first sale of fisheries products after initial processing by a commercial processor with a Federal Processor Permit. Groundfish first wholesale production data are sourced from at-sea and shoreside groundfish production reports. ***Wholesale value and prices** are given as F.O.B. (Free On Board) Alaska, indicating that transportation costs are not included in values and prices.

- The BSAI gross value of sablefish for at-sea and shoreside and for all products was $7.6 million which was the second lowest value for the period 2016-2020.
- The GOA gross value of sablefish for all products was $57.1 million in 2020 which was the lowest value for the period 2016-2020.
- The GOA price per pound value of sablefish for all products was $4.07/lb in 2020 which was the second lowest value for the period 2016-2020. For the BSAI, the value was $2.62/lb in 2020 for catcher/processors and $3.39/lb for shoreside processors which were both the lowest values for the period 2016-2020.
- The GOA total product value per round metric ton of retained sablefish was $5,004/mt in 2020 which was the second lowest value for the period 2016-2020. For the BSAI, the value was $2,850/mt in 2020 for catcher/processors and $1,983/mt in 2020 for shoreside processors both the lowest values for the period 2016-2020.

7 Assessment Process

This Assessment constitutes an evaluation of the applicant fisheries' management systems against the conformance criteria outlined in the Responsible Fisheries Management Certification Program Fisheries Standard Version 2.1.

7.1 Scoring

Each clause of the RFM Fishery Standard is scored based on defined process which Certification Bodies are required to follow. The process is described in brief below and is also outlined in detail in the relevant scheme documents (See Details of Applicable RFM Documents for further details).

7.1.1 Evaluation Parameters

Evaluation Parameters (described below), which effectively break down each clause using defined performance related parameters, form the basis of scoring.

Process Evaluation Parameter

Requires that evidence is provided outlining the process or system used by a fishery management organization to implement or maintain key aspects of fishery management practices, 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 scarce or non-existent, then this Evaluation Parameter is not satisfied.

Current Status/Appropriateness/Effectiveness Evaluation Parameter

Requires that the current status, appropriateness, or effectiveness of an element of fisheries management practices (depending on which one of these attributes is most relevant to a given 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 scarce or non-existent, then this Evaluation Parameter is not satisfied.

Evidence Basis Evaluation Parameter

Requires that the availability, quality, or adequacy of the evidence that is the base for scoring a given clause is assessed. If evidence availability (such as studies, reports, other data, and regulations) is scarce, low quality or non-existent, then this Evaluation Parameter is not satisfied.

7.1.2 Numerical Scoring based on Evaluation Parameters

Confidence Ratings and Conformance Levels for each Clause are determined based on the following process:

1. Numerical scoring is effectively a reverse process with each applicable Clause starting out the maximum possible overall score of 10.
2. The Assessment Team is then required to subtract 3 from that total for each Evaluation Parameter not met to reach an overall numerical score for that Clause
3. The Clause is then assigned both a Confidence Rating and an overall Conformance Level based on its overall numerical score as follows:

Overall Score	Confidence Rating	Conformance Level
10	High	Full Conformance
7	Medium	Minor Non-conformance
4	Medium	Major Non-conformance
1	Low	Critical Non-conformance

7.1.3 Confidence Ratings and Non-conformances

Based on the numerical scoring process described above, clauses of the fisheries standards are assigned Confidence Ratings and Conformance Levels—these are intended to reflect the below descriptions.

- **Critical Non-Conformance – Low Confidence Rating**
  Information/evidence is completely absent or contradictive to demonstrate conformance to a clause. Absence of information/evidence results in a low confidence rating. In these cases, a critical non-conformance is assigned.

- **Major Non-Conformance – Medium Confidence Rating**
  Information/evidence to demonstrate conformance to a clause is limited. In these cases, a major improvement is needed to achieve full conformance. A medium confidence rating with a major non-conformance is assigned.

- **Minor Non-Conformance – Medium Confidence Rating**
  Information/evidence is broadly available to demonstrate conformance to a clause although there are limited gaps in information that, if available, could clarify aspects of conformance and allow the assessment team to assign a high confidence rating. In these cases, a minor improvement is needed to achieve full conformance. A medium confidence rating with a minor non-conformance is assigned.

- **Full Conformance – High Confidence Rating**
  Sufficient information/evidence is available to demonstrate full conformance to a clause. In these cases, a high confidence rating is assigned. Sufficient evidence is that which allows objective determination by the assessment team that a fishery fully complies with a given clause in the RFM Fishery Standard.

Where a non-conformance (regardless of type) is assigned, the assessment team requests further information/clarification from the Client to confirm the non-conformance. The non-conformance is then re-considered in light of any further evidence provided; this may result in a non-conformance being upgraded, downgraded or closed.

7.1.4 Overall Assessment Scoring

RFM Fishery Standard clauses are categorized into four sections:

A. The Fishery 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

Any more than one (1) major non-conformance or three (3) minor non-conformances assigned to any Section will result in the assignment of a critical non-conformance at section level.

A critical non-conformance for any clause or section stops the assessment, unless/until the Client is able to provide additional information/evidence that demonstrates a higher level of conformity.

7.2 Consultation Meetings

Table 15. Summary of Assessment meetings, 06/21/2022-07/07/22*
*Assessment meetings were done during the 5th surveillance audit.

Meeting Date and Location	Personnel	Areas of discussion
Date: 06/21/2022 Location: Conference call	ADFG: Forrest Bowers Philip J. Joy Rhea K. Ehresmann Asia Beder Assessment Team Members: Dr. Ivan Mateo, Lead Assessor Dr. Robert Leaf, Assessor Mr. Robert Allain, Assessor	▪ Statewide Commercial Groundfish Regulations 2022-2023. ▪ Fisheries management activities report – Pacific halibut commercial fisheries in state waters 2021 year-end and 2022 (if possible). ▪ Emergency orders/releases issued in 2021 and 2022 specific to the Halibut and Sablefish commercial fisheries from the Board of Fisheries. ▪ Information on how all 10 National Standards under the Magnuson-Stevens Act (MSA) (or equivalent state standards) are operationalized in the Pacific halibut commercial fisheries in state waters. ▪ External audits of the Halibut commercial fisheries in 2021 or 2022.
Date: 06/22/2022 Location: Conference call	AK NOAA Regional Office: Mary Furuness Alicia Miller Molly Zaleski Mason Smith Assessment Team Members: Dr. Ivan Mateo, Lead Assessor Dr. Robert Leaf, Assessor Mr. Robert Allain, Assessor	▪ Update - Electronic Technology Implementation Plan (Draft - January 28, 2021). ▪ Any adjustments to NOAA's Vessel Monitoring System (VMS) requirements for ▪ Alaska in 2021 and 2022. ▪ Evidence of how all 10 National Standards under the MSA are operationalized in the Pacific halibut and sablefish commercial fisheries in federal waters. ▪ External audits of the Halibut and Sablefish commercial fisheries in 2021 or 2022. ▪ recent advances in our understanding of sablefish EFH. ▪ Outcome indicators consistent with avoiding adverse impacts to sablefish EFH. ▪ Sablefish fisheries interactions with marine mammals, seabirds or other ETP species. ▪ Species composition of bycatch by weight database.
06/23/2022 Location: Conference call	NPFMC: Sarah Cleaver Sam Cunningham Anna Hentry Dave Witherell Diana Evans Assessment Team Members: Dr. Ivan Mateo, Lead Assessor Dr. Robert Leaf, Assessor Mr. Robert Allain, Assessor	▪ Federal 2021-2022 FMP for Groundfish of the GOA and BSAI. ▪ Federal Sablefish FMP for NSEI and SSEI 2021-2022. ▪ Annual Report 2021 of the Technical Subcommittee of the Canada-US Groundfish Committee. ▪ Evidence of how all 10 National Standards under the MSA are operationalized in the Pacific halibut and sablefish commercial fisheries in federal waters. ▪ Status of essential fish habitat 5-year review update. ▪ Probable adverse impacts of the sablefish fisheries on habitats. ▪ Probable adverse human impacts on the BS/AI ecosystem
Date: 06/24/2022	IPHC Ian Stewart	▪ Major changes in understanding the magnitude of fishery removals.

Meeting Date and Location	Personnel	Areas of discussion
Location: Conference call	Allan Hicks Barbara Utniczak Assessment Team Members: Dr. Ivan Mateo, Lead Assessor Dr. Robert Leaf, Assessor Mr. Robert Allain, Assessor	▪ Modifications in the observer programs to understand the magnitude of incidental discards or their length- and age-composition. ▪ Major unreported changes to the stock assessment model formulations. ▪ Discussion of any insights from their research activities to describe: - Reproduction - Growth and Condition - Growth mortality and survival - Distribution and migration - Genetics
Date: 06/30/2022 Location: Conference call	AK Board of Fisheries Kristy Tibbles Assessment Team Members: Dr. Ivan Mateo, Lead Assessor Dr. Robert Leaf, Assessor Mr. Robert Allain, Assessor	▪ Discussion of role and processes in AK Board of Fisheries (BOF).
Date: 07/06/2022 Location: Conference call	AWT CAPT. Aaron Frenzel Assessment Team Members: Dr. Ivan Mateo, Lead Assessor Dr. Robert Leaf, Assessor Mr. Robert Allain, Assessor	▪ Number of boardings, number of violations detected, types of violations for the species in question. ▪ General level of compliance overall. Updates for 2021. ▪ Enforcement and compliance performance.
Date: 07/07/2022 Location: Conference call	NMFS AKFSC MESA Group: Chris Lunsford Cara Rodgveller Assessment Team Members: Dr. Ivan Mateo, Lead Assessor Dr. Robert Leaf, Assessor Mr. Robert Allain, Assessor	▪ Major changes in understanding the magnitude of fishery removals. ▪ Modifications in the observer programs to understand the magnitude of incidental discards or their length- and age- composition. ▪ Major unreported changes to the stock assessment model formulations. ▪ Discussion of any insights from their research activities to describe: - Reproduction - Growth and Condition - Growth mortality and survival - Distribution and migration - Genetics

8 Summary of Assessment Outcomes

8.1 Assessment Outcomes by Clause

Table 16 below presents Confidence Ratings and Conformance Levels for each applicable Clause resulting from this Assessment.

Table 16. Confidence ratings and conformance levels for each clause of the RFM Standard.

Section		Fundamental Clause	Supporting Clause	Applicable?	Numerical score	Confidence Rating	Conformance Level	NC No.
Topics that will trigger immediate assessment failure				Yes	n/a	High	Full	
A	The Fisheries Management System	1	1.1	Yes	10	High	Full	
			1.2	Yes	10	High	Full	
			1.2.1	Yes	10	High	Full	
			1.3	Yes	10	High	Full	
			1.3.1	Yes	10	High	Full	
			1.4	No	n/a	n/a	n/a	
			1.4.1	Yes	10	High	Full	
			1.5	Yes	10	High	Full	
			1.6	Yes	10	High	Full	
			1.6.1	No	n/a	n/a	n/a	
			1.7	Yes	10	High	Full	
			1.8	Yes	10	High	Full	
			1.9	No	n/a	n/a	n/a	
		2	2.1	Yes	10	High	Full	
			2.1.1	Yes	10	High	Full	
			2.1.2	Yes	10	High	Full	
			2.2	Yes	10	High	Full	
			2.3	Yes	10	High	Full	
			2.4	Yes	10	High	Full	
			2.5	Yes	10	High	Full	
			2.6	Yes	10	High	Full	
			2.7	Yes	10	High	Full	
		3	3.1	Yes	10	High	Full	
			3.1.1	Yes	10	High	Full	
			3.1.2	Yes	10	High	Full	
			3.1.3	Yes	10	High	Full	
			3.2	No	n/a	n/a	n/a	
			3.2.1	Yes	10	High	Full	
			3.2.2	Yes	10	High	Full	
			3.2.3	Yes	10	High	Full	
			3.2.4	Yes	10	High	Full	
B	Science, Stock Assessment Activities, and the Precautionary Approach	4	4.1	Yes	10	High	Full	
			4.1.1	Yes	10	High	Full	
			4.1.2	No	n/a	n/a	n/a	
			4.2	Yes	10	High	Full	
			4.2.1	Yes	10	High	Full	
			4.3	Yes	10	High	Full	
			4.4	Yes	10	High	Full	
			4.5	Yes	10	High	Full	
			4.6	Yes	10	High	Full	

Section		Fundamental Clause	Supporting Clause	Applicable?	Numerical score	Confidence Rating	Conformance Level	NC No.
			4.7	Yes	10	High	Full	
			4.8	No	n/a	n/a	n/a	
			4.9	No	n/a	n/a	n/a	
			4.10	No	n/a	n/a	n/a	
			4.11	No	n/a	n/a	n/a	
		5	5.1	Yes	10	High	Full	
			5.1.1	No	n/a	n/a	n/a	
			5.1.2	Yes	10	High	Full	
			5.2	Yes	10	High	Full	
			5.3	Yes	10	High	Full	
			5.4	Yes	10	High	Full	
			5.5	Yes	10	High	Full	
		6	6.1	Yes	10	High	Full	
			6.2	Yes	10	High	Full	
			6.3	Yes	10	High	Full	
			6.4	Yes	10	High	Full	
			6.5	Yes	10	High	Full	
		7	7.1	Yes	10	High	Full	
			7.1.1	Yes	10	High	Full	
			7.1.2	No	n/a	n/a	n/a	
			7.2	No	n/a	n/a	n/a	
C	Management measures, implementation, monitoring, and control	8	8.1	Yes	10	High	Full	
			8.1.1	Yes	10	High	Full	
			8.1.2	Yes	10	High	Full	
			8.2	Yes	10	High	Full	
			8.3	Yes	10	High	Full	
			8.4	Yes	10	High	Full	
			8.4.1	Yes	10	High	Full	
			8.5	Yes	10	High	Full	
			8.5.1	Yes	10	High	Full	
			8.6	Yes	10	High	Full	
			8.7	Yes	10	High	Full	
			8.8	Yes	10	High	Full	
			8.9	Yes	10	High	Full	
			8.10	No	n/a	n/a	n/a	
			8.11	Yes	10	High	Full	
			8.12	Yes	10	High	Full	
			8.13	No	n/a	n/a	n/a	
		9	9.1	Yes	10	High	Full	
			9.2	Yes	10	High	Full	
			9.3	Yes	10	High	Full	
		10	10.1	Yes	10	High	Full	
			10.2	Yes	10	High	Full	
			10.3	No	n/a	n/a	n/a	
			10.3.1	No	n/a	n/a	n/a	
			10.4	No	n/a	n/a	n/a	
			10.4.1	No	n/a	n/a	n/a	
		11	11.1	Yes	10	High	Full	

Section		Fundamental Clause	Supporting Clause	Applicable?	Numerical score	Confidence Rating	Conformance Level	NC No.
			11.2	Yes	10	High	Full	
			11.3	Yes	10	High	Full	
			11.4					
D	Serious Impacts of the Fishery on the Ecosystem	12	12.1	Yes	10	High	Full	
			12.2	Yes	10	High	Full	
			12.2.1	Yes	10	High	Full	
			12.2.2	Yes	10	High	Full	
			12.2.3	Yes	10	High	Full	
			12.2.4	Yes	10	High	Full	
			12.2.5	Yes	10	High	Full	
			12.2.6	Yes	10	High	Full	
			12.2.7	Yes	10	High	Full	
			12.2.8	Yes	10	High	Full	
			12.2.9	Yes	10	High	Full	
			12.2.10	Yes	10	High	Full	
			12.2.11	Yes	10	High	Full	
			12.3	Yes	10	High	Full	
			12.4	Yes	10	High	Full	
			12.5	Yes	10	High	Full	
			12.6	Yes	10	High	Full	
			12.7	Yes	10	High	Full	
		13	13.1	No				
			13.1.1	No				
			13.2	No				
			13.2.1	No				
			13.3	No				
			13.4	No				
			13.5	No				
			13.6	No				
			13.7	No				
			13.7.1	No				
			13.7.2	No				
			13.7.3	No				
			13.8	No				
			13.9	No				
			13.10	No				
			13.11	No				
			13.12	No				
			13.13	No				

8.2 Certification Recommendation

The Assessment Team makes a Recommendation as to whether an applicant fishery should be certified.

Following this Assessment, the Assessment Team recommends that the applicant fisheries;

- **Alaska Pacific Sablefish (Black Cod) Commercial Fishery**
- **Alaska Pacific Halibut Commercial Fishery ;**

be certified against RFM Certification Program Fisheries Standard Version 2.1.

8.3 Certification Determination

Global Trust's internal Fishery Certification Committee, which is comprised of both internal and external fishery experts as well as certification experts, makes the ultimate determination as to whether an applicant fishery is granted certification.

Following a meeting on MMMM DD^{dd} YYYY, the Certification Committee has determined that the applicant fishery in this instance;

- **<insert fishery name>;**

be certified against RFM Certification Program Fisheries Standard Version 2.1.

OR

should not be certified against RFM Certification Program Fisheries Standard Version 2.1 until such time as management moves to address the main areas of concern.

9 Assessment Outcomes

9.1 Topics that will trigger immediate assessment failure.

According to the RFM Standard Version 2.1, the following fisheries management issues will cause a fishery to immediately fail assessment:

- 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.

The Assessment Team has, as part of this Assessment, carried out a review of the available evidence with respect to these issues. The results of this review are presented below.

Topics that will trigger immediate assessment failure.						
Dynamiting, poisoning, and other comparable destructive fishing practices.						
Confidence that this is NOT occurring:	**Low**	☐	**Medium**	☐	**High**	☑
SUPPORTING EVIDENCE:	**There is no evidence of such methods being employed in the fishery under assessment.**					
Significant illegal, unreported, and unregulated (IUU) fishing activities in the country jurisdiction.						
Confidence that this is NOT occurring:	**Low**	☐	**Medium**	☐	**High**	☑
SUPPORTING EVIDENCE:	**There is no evidence of significant (or otherwise) illegal, unreported, and unregulated (IUU) fishing activities within State and Federal jurisdictions of Alaska**					
Shark finning.						
Confidence that this is NOT occurring:	**Low**	☐	**Medium**	☐	**High**	☑
SUPPORTING EVIDENCE:	**There is no evidence of shark finning in the fishery under assessment and such a practice is highly unlikely given the lack of shark bycatch**					
Slavery and slave labor on board fishing vessels.						
Confidence that this is NOT occurring:	**Low**	☐	**Medium**	☐	**High**	☑
SUPPORTING EVIDENCE:	**There is no evidence of incidences of successful prosecutions of entities involved in the fishery under assessment for slavery and/or slave labor offences**					
Significant lack of compliance with the requirements of an international fisheries agreement.						
Confidence that this is NOT occurring:	**Low**	☐	**Medium**	☐	**High**	☑

Topics that will trigger immediate assessment failure.						
Dynamiting, poisoning, and other comparable destructive fishing practices.						
Confidence that this is NOT occurring:	**Low**	☐	**Medium**	☐	**High**	☑
SUPPORTING EVIDENCE:	**The fishery under assessment is entirely State managed and as such is not subject to international fisheries agreements**					

9.2 Section A: The Fisheries Management System

9.2.1 Fundamental Clause 1. Structured and legally mandated management system

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.

9.2.1.1 Supporting Clause 1.1.

1.1.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *Management agencies are physically and legally established at international, State and local levels.*	☑

EVIDENCE

Sablefish

The Alaska commercial sablefish fishery is managed collaboratively by the North Pacific Fishery Management Council (NPFMC) and NOAA's National Marine Fisheries Service (NMFS) in federal waters (3-200 nm); and by the Alaska Department of Fish and Game (ADFG) and the Board of Fisheries (BOF) in state waters (0-3 nm). In federal waters, the fishery is managed through the NPFMC's GOA and BSAI Groundfish Fishery Management Plans (FMPs) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

All agencies have well-established advisory committees (i.e., scientific, technical, policy, enforcement) that undertake monitoring and analysis, performance assessment, policy and economic formulations, and other functions as necessary. Members typically include federal, state, academic and industry representatives.

The management system for the commercial sablefish fishery is highly structured and legally supported by federal and state statutes and regulations. Changes to the management system in 2021 and 2022 were essentially those required to implement new or amended rules, and year-over-year adjustments to FMP measures, including allocative formulae (OFLs, ABCs, PSCs, GHLs, IFQ temporary transfers), opening and closing dates, bycatch monitoring, at-sea observer coverage levels (where implemented), and VMS requirements (where implemented).

Pacific Halibut

The management system for the Pacific halibut commercial fishery is highly structured and legally supported by federal and state statutes and regulations, including by international convention. Changes to the management system at the international and state levels in 2020 and 2021 were essentially those required to implement new or amended rules, and year-over-year adjustments to FMP measures, including allocative formulae (OFLs, ABCs, PSCs, GHLs, IFQ temporary transfers), opening and closing dates, bycatch monitoring, at-sea observer coverage levels, catch reporting, and halibut sorting on deck.

The International Pacific Halibut Commission (IPHC) and NOAA's National Marine Fisheries Service (NMFS) collaboratively manage fishing for Pacific Halibut through regulations established under authority of the *Northern Pacific Halibut Act* of 1982. The Act also provides the North Pacific Fishery Management Council (Council) with authority to develop regulations, including limited access regulations that are in addition to, and not in conflict with, approved IPHC regulations. Such Council-developed regulations may be implemented by NMFS only after approval by the Secretary of Commerce. The Council has exercised this authority most notably in the development of its IFQ Program.

Both agencies have well-established advisory committees (i.e., scientific, technical, policy, enforcement) that undertake monitoring and analysis of key indicators, performance assessment, policy and economic formulations, and other functions as necessary and all

1.1.	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.

recommendations go through extensive review through a FMP implementation teams. Members typically include federal, state, academic and industry representatives.

Federal regulatory changes for the 2021 fishery as well as those for 2022 (to June 30th) followed the normal pre-and in-season practices of amending specific provisions and rules as required to ensure that management measures reflected decisions made and were legally binding and enforceable and considered impacts on stakeholders. Typically, in-season actions may include, but are not limited to, establishment or modification of the following: (i) closed areas, (ii) fishing periods, (iii) fishing period limits, (iv) gear restrictions, (v) recreational bag limits, (vi) size limits, and (vii) vessel clearances.

Current status: *The output of the management organization(s) is in line with fishery resource management needs. Examples may include rule making, scientific research, stock and ecosystem assessments, implementation of rules and regulations, and enforcement activities.*	☑

EVIDENCE:

Sablefish

Sablefish in federal waters are managed by regions to distribute exploitation. The acceptable biological catch (ABC) is apportioned between these regions and then allocated between gear types. A stock assessment is performed annually for the federal fishery using an age-structured model; this assessment is reviewed by the North Pacific Management Council. The sablefish fishery's management plan for 2021 for the state's NSEI and SSEI sub-districts included a small number of regulatory provisions and rules as needed to ensure that management measures reflected decisions made and were legally binding and enforceable. Typically, these regulatory actions/rules included changes to fleet and area allocation tables, fishing gear characteristics, quota sharing, bycatch provisions, area closures, opening and closing dates etc. These changes were necessary inorder to manage exploitation more efficiently.

The 2021 NSEI Sub-district commercial sablefish fishery Annual Harvest Objective (AHO) was 1,137,867 round pounds. There were 73 valid Commercial Fisheries Entry Commission (CFEC) permits for 2021, which was two fewer permits compared to 2020. The individual equal quota share (EQS) was 15,587 round pounds, a 5.5% increase from the 2020 EQS of 14,773 round pounds. The AHO was based on the sablefish ABC with decrements made for sablefish mortality in other fisheries. The recommended 2021 ABC was 1,255,056 round pounds (FABC = 0.061), a 3.1% increase from the 2020 ABC. The increase in the ABC was attributed to a series of relatively strong recruitment events occurring between 2013 and 2016 and a substantial increase in the longline survey catch per unit effort (CPUE).

The 2021 SSEI AHO is 601,271 round lb, a 5% increase from the 2020 AHO. The recommended increase in the AHO will continue to provide fishery stability and sustainability through conservative management action. For the 2021 SSEI fishery, there were 19 Commercial Fisheries Entry Commission (CFEC) longline/pot (C61C) and three pot (C91C) permits, resulting in a 2021 Equal Quota Share (EQS) of 27,330 round lb for each permit holder. Positive indicators for sablefish in SSEI include increases in both the longline survey and fishery CPUE indices from 2019 to 2020 and continued increases in recruitment from the 2014, 2016, and potentially strong 2017 age classes in other fisheries and neighboring geographic areas, although the overall magnitude of the projected increase in spawning stock biomass is uncertain and to what extent this projected increase may benefit SSEI is unknown. Rules affecting the IFQ Program that were introduced in 2021 included:

- **Temporary Rule:** IFQ/CDQ Sablefish Opening. Effective March 6, 2021, NOAA Fisheries announced the opening of directed fishing for sablefish with fixed gear managed under the IFQ Program and the Community Development Quota (CDQ) Program (86 FR 13493, 03/09/2021). The season opened on March 6, 2021, and closed on December 7, 2021.
- **Emergency Rule - Temporary Transfers:** Effective March 30, 2021, NMFS issued this temporary emergency rule to modify the temporary transfer provision of the IFQ Program for the fixed-gear commercial Pacific halibut and sablefish fisheries for the 2021 IFQ fishing year (86 FR 16542, 03/30/2021).3 This emergency rule was intended to provide flexibility to quota share (QS) holders in 2021, while preserving the Program's long-standing objective of maintaining an owner operated IFQ fishery in future years and did not modify other provisions of the IFQ Program.

1.1.	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.

- **Temporary Rule - Closure:** Effective July 17, 2021, NMFS prohibits the retention of non-Community Development Quota (CDQ) sablefish by vessels using trawl gear in the Bering Sea subarea of the Bering Sea and Aleutian Islands management area (BSAI).4 This action is necessary because the 2021 non-CDQ sablefish initial total allowable catch (ITAC) in the Bering Sea subarea of the BSAI will be reached.
- **Final Rule - Sablefish Pot Gear Tags and Notary Certification Requirements:** Effective December 13, 2021, NOAA Fisheries issued regulations to modify recordkeeping and reporting requirements by removing pot gear tag requirements in the sablefish IFQ fishery in the Gulf of Alaska (GOA) and removing requirements to obtain and submit a notary certification on various programs' application forms (86 FR 70751, 12/13/2021).5 This action was intended to reduce administrative burden on the regulated fishing industry and NOAA Fisheries.

Pacific Halibut

The IPHC's regulations for 2022 were published on March 3, 2022. Sections 3 to 8 and 30 apply generally to all Pacific halibut fishing while Sections 8 to 23 apply to commercial fishing for Pacific halibut.

Regulatory Actions undertaken by the NPFMC, IPHC and NOAA for the 2021-22 Commercial Halibut Fishery included:

- **Halibut Annual Management Measures.** Effective February 18, 2021, NOAA on behalf of the IPHC published as regulations the 2021 annual management measures governing the Pacific halibut fishery that have been recommended by the IPHC and accepted by the Secretary of State (86 FR 13475, March 9, 2021).The opening date for all IPHC regulatory areas was March 6, 2021, and the closing date for the halibut fisheries in all regulatory areas was December 7, 2021.
- **Emergency Rule: Temporary Transfers.** Effective March 30, 2021, NMFS issued this temporary emergency rule to modify the temporary transfer provision of the IFQ Program for the fixed-gear commercial Pacific halibut (and sablefish) fishery for the 2021 IFQ fishing year (86 FR 16542, 03/30/2021). This emergency rule was intended to provide flexibility to quota share (QS) holders in 2021, while preserving the Program's long-standing objective of maintaining an owner operated IFQ fishery in future years and did not modify other provisions of the IFQ Program.
- **Final Rule: Vessel Use Caps.** Effective May 26, 2021, NOAA removed vessel use caps in IFQ regulatory areas 4A (Eastern Aleutian Islands), 4B (Central and Western Aleutian Islands), 4C (Central Bering Sea), and 4D (Eastern Bering Sea) for the 2021 IFQ fishing year (86 FR 28294, 05/26/2021). This action was needed to provide additional flexibility to IFQ participants in 2021 to ensure allocations of halibut IFQ can be harvested by the limited number of vessels operating in these areas thus facilitating equity amongst stakeholders.

Appropriateness/Effectiveness: *The management framework is appropriate for managing the resource. For example, the larger the exploitation, vulnerability, or risks of a fish stock, the more focus and precision (assessment of the resource ensuring the risks related to overfishing and equivalent negative effects) are required 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.*	☑

EVIDENCE:

Pacific Halibut and Sablefish

There is no evidence to indicate that the management systems for the fisheries are subject to continual unresolved or repeated disputes or political instability. The management frameworks are appropriate for managing the resource, as evidenced in the sections above. Moreover, the most recent stock assessment updates continue to conclude that the stocks are not overfished nor is overfishing occurring.

Evidence Basis: *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,*	☑

1.1.	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.

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.

EVIDENCE:
Pacific Halibut and Sablefish
The availability and quality of evidence is sufficient to substantiate an effective legal and administrative framework is appropriate for fishery resource conservation and management. Please see supported evidence on the references.
Evidence of this is in form of 2022 IPHC regulations, Pacific halibut catch sharing plan among other examples cited below

References:

1. https://www.iphc.int/uploads/pdf/regs/iphc-2022-regs.pdf
2. https://www.federalregister.gov/documents/2021/03/09/2021-04821/pacific-halibut-fisheries-catch-sharing-plan
3. https://www.federalregister.gov/documents/2021/03/30/2021-06509/fisheries-of-the-exclusive-economic-zone-off-alaska-ifq-program-modify-temporary-transfer-provisions
4. https://www.federalregister.gov/documents/2021/05/26/2021-11087/pacific-halibut-fisheries-catch-sharing-plan

	Starting score		Number of EPs NOT met			Overall score
Numerical score:	10	– (	0	x 3)	=	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**

9.2.1.2 Supporting Clause 1.2.

1.2.	**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.**
Relevance:	Relevant

Evaluation Parameters	Met?
Current status/Appropriateness: *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).*	☑

EVIDENCE:

Sablefish

The NMFS and ADFG conduct assessment surveys on sablefish in Alaskan waters. The NMFS conducts an annual longline survey and a triennial trawl survey in the Gulf of Alaska, and ADFG performs annual longline surveys in Chatham and Clarence Strait. These surveys provide estimates of catch per unit effort, relative abundance, and biological data all critical input to the stock assessment model and to informing abundance trends by geographical area. In addition, tagging studies exist to study sablefish movement for federal, state, and Canadian waters such studies integral to refining sablefish migration patterns. The ADFG conducts an annual tagging survey in Chatham Strait as part of a mark-recapture study to estimate population abundance.

Further investigations into the migration of sablefish are being conducted in Alaska. The NMFS is actively working on a migration model that includes both federal and state waters. In addition, the ADFG is conducting pilot studies to determine the feasibility of acoustic tagging of sablefish in Chatham Strait. Sablefish are assessed as a single population in Federal waters off Alaska with management and regulatory decisions being implemented at the regulatory area level. The NPFMC explicitly considers sablefish life cycle and migration patterns when recommending apportionments of Allowable Biological Catch (ABC) and Overfishing Limit (OFL) between regulatory areas.

As the biological stock unit encompasses multiple national jurisdictions (i.e., U.S. state and federal) the NPFMC and NMFS consider exploitation by all parties when defining exploitation levels and determining stock health to avoid overfishing/depletion of the resource. The NPFMC apportions the ABC and OFL between regulatory areas based on a 5-year exponential weighting of the survey and fishery abundance indices.

A single sablefish stock occupies the Bering Sea, Aleutian Islands, and Gulf of Alaska. As appropriate for a single stock, a single Overfishing Level (OFL) is established for sablefish, statewide. Current model predictions indicate that this stock is not subject to overfishing, not overfished, and not approaching an overfished condition. Acceptable Biological Catches (ABCs) for sablefish are specified by management area and have been reduced from the maximum permissible ABC for the last several years. Annual Catch Limits (ACLs) are set well below biomass estimates, and Total Allowable Catches (TACs) are set well below ABC.

Sablefish are managed under Tier 3 of NPFMC harvest control rules. The updated point estimate of B40%, is 118,140 t. Since projected female spawning biomass (combined areas) for 2022 is 128,789 t (equivalent to B44%), sablefish is in sub-tier “a” of Tier 3. Spawning biomass is projected to continue to increase rapidly in the near-term reaching B44% in 2022 and B51% in 2023. The updated point estimates of F40% and F35% from this assessment are 0.080 and 0.094, respectively. Thus, the maximum permissible value of FABC under Tier 3a is 0.080, which translates into a 2022 maximum permissible ABC (combined areas) of 34,863 t. The OFL fishing mortality rate is 0.094, which translates into a 2022 OFL (combined areas) of 40,432 t. Thus, current model projections indicate that the Alaskan sablefish stock is not undergoing overfishing, not overfished, and not approaching an overfished condition.

1.2.	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.

Pacific Halibut

The groundfish fisheries in Federal waters off Alaska are managed under the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI FMP) and the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA FMP). In the Gulf of Alaska (GOA), the Bering Sea and Aleutian Islands (BSAI), groundfish harvests are managed subject to annual limits on the quantity of each species of fish, or of each group of species, that may be taken. The fishery is a closed access fishery managed under an Individual Fishing Quota (IFQ) system. The Pacific halibut fishery is jointly managed by the IPHC and NOAA Fisheries under a suite of rules, measures and policies that are harmonized and complimentary.

Each agency has a multi-year strategic plan that guide fisheries management decisions against a framework of long and short-term objectives that (i) support responsible and sustainable fisheries, (ii) promote economic viability across all sectors, (iii) recognize and respect indigenous treaty rights, and (iv) sustain dependent, rural communities.

The IPHC's current interim management procedure specifies a target level of fishing intensity to achieve a Spawning Potential Ratio (SPR) corresponding to an F43%; this equates to the level of fishing that would reduce the lifetime spawning output per recruit to 43% of the unfished level given current biology, fishery characteristics and demographics. Based on the 2021 assessment, the 2021 fishing intensity is estimated to correspond to an F46% (credible interval: 35-63%).

The projections for this assessment are more optimistic than those from the 2019 and 2020 assessments due largely to the increasing projected maturity of the 2012-year class. This translates to a lower probability of stock decline for 2022 than in recent assessments as well as a decrease in this probability through 2023-24. There is greater than a 50% probability of stock decline in 2023 (55- 64/100) for the entire range of SPR values from 40-46%, which include the status quo Total Constant Exploitation Yield (TCEY) and the F43% reference level. The 2022 "3-year surplus" alternative corresponds to a TCEY of 38.0 million pounds (~17,240 t), and a projected SPR of 48% (credible interval 32-63%). At the SPR_43% reference level), the probability of spawning biomass'decline from 2022 to 2023 is 59%, decreasing to 55% in three years, as the 2012 cohort matures. The one-year probability risk of the stock dropping below SB30% ranges from 43% at the F46% level to 45% at the at the F40% level of fishing intensity.

Annually, the Council's harvest specifications process is to apply the harvest strategy to the best available scientific information to derive annual harvest specifications. The Council's Groundfish Plan Teams and Scientific and Statistical Committee (SSC) use stock assessments to calculate biomass, overfishing levels, and acceptable biological catch (ABC) limits for each species or species group for specified management areas. Overfishing levels and ABCs provide the foundation for the Council and NMFS to develop the total allowable catch (TAC) for each species or species group. Overfishing levels and ABC amounts reflect results from best available fishery science, as derived from the stock assessment model and applied in light of the requirements of the FMPs. The TACs recommended by the Council are either at or below the ABCs. The sum of the TACs for each area (the BSAI or GOA) is constrained by the optimum yield established for that area. The annual harvest specifications also set or apportion the prohibited species catch (PSC) limits.

As for the current 2020 and 2021 specifications, the revised harvest strategy provides for orderly and controlled commercial fishing for groundfish; promotes sustainable incomes to the fishing, fish processing, and support industries; supports sustainable fishing communities; and provides a steady supply of fish products to consumers. The harvest strategy balances groundfish harvest in the fishing year with ecosystem needs such as non-target fish stocks, marine mammals, seabirds, and habitat

Effectiveness: *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).*	☑

1.2.	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.

EVIDENCE:
Refer to discussion in "current status" section above.

Effectiveness: *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.*	☑

EVIDENCE:
Refer to discussion in "current status" section above.

Evidence Basis: *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.*	☑

EVIDENCE:
The availability and adequacy of the evidence is sufficient to substantiate that management measures consider stock status, the areas through which the stocks migrate, other biological characteristics of the stock. Please see supported evidence on the references.

References:	1. https://rfmcertification.org/wp-content/uploads/2022/09/5th-Surveillance-report-Alaska-Pacific-halibut-Form-9g-RFM-CSC-RFM.pdf 2. https://rfmcertification.org/wp-content/uploads/2022/09/5th-Surveillance-Report-Sablefish-Form-9g-RFM-CSC-RFM.pdf

	Starting score			Number of EPs NOT met					Overall score
Numerical score:	10	–	(	0	x	3	)	=	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**

9.2.1.3 Supporting Clause 1.2.1.

1.2.1.	**Previously agreed management measures established and applied in the same region shall be taken into account by management.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑
EVIDENCE: The principal Federal and State fisheries agencies operate through a longstanding and well-established process of continual review of scientific assessments and management measures supported by public engagement, and transparent decision-making and rulemaking. FMP measures include harvest guidelines, quotas, trip and landing limits, area restrictions, seasonal closures, and gear restrictions. **Sablefish** The process employed by the Alaska Board of Fisheries for deriving the 2021 and 2022 management measures for the fishery are summarized at Table 6 of the GTC's 5th Surveillance Audit Report which includes meeting discussions and decisions adopted by the Board and its members. The Board meets regularly during the year to consider proposals from the industry and stakeholders, and routinely monitors developments originating at the federal level. Annual management measures are hosted on the Board's website including adopted measures from previous years. **Pacific Halibut** The process employed by the NPFMC for deriving the 2021 and 2022 management measures for the fishery are summarized at Table 5 of the GTC's 5th Surveillance Audit Report which includes meeting discussions and decisions adopted by the Council and its members. (The table's format did not lend itself to be pasted here). Every three years, the Council reviews management programs in the Bering Sea and Gulf of Alaska to make sure the goals and objectives are being met. Table 6 of the same report summarizes the discussions and decisions adopted by the Alaska Board of Fisheries relative to Pacific halibut in state waters for 2021 and 2022 (partial).		
Current status/Appropriateness/Effectiveness: *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.*		☑
EVIDENCE: Refer to discussion in "current status" section above including discussion in 1.2.		
Evidence Basis: *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.*		☑
EVIDENCE: The availability and 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. Evidence of this found on NPFMC meeting minutes and minutes of the AKBOF meetings		
References:	1. https://www.npfmc.org/meeting-minutes/ 2. https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo)	

Numerical score:	Starting score	− (	Number of EPs NOT met	x 3)	=	Overall score
	10		0			10
Corresponding Confidence Rating:						High

1.2.1.	**Previously agreed management measures established and applied in the same region shall be taken into account by management.**
(10 = High; 4 or 7 = Medium; 1 = Low)	
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)	Full Conformance
Non-conformance Number (if applicable):	**NA**

9.2.1.4 Supporting Clause 1.3.

1.3.	**Where transboundary, shared, straddling, highly migratory, or high seas stocks are exploited by two or more States (neighboring 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.**	
Relevance:	Relevant	
	Note: This clause pertains only if the stock is transboundary, shared, straddling, highly migratory, or high seas. Otherwise, this clause is not applicable. This clause is justified by the evidence provided in clause 1.2. Where sub-stocks are referred to as part of an overall stock, there shall be sufficient information on biology, distribution, and life cycle that demonstrates the degree of association or disassociation, and the basis for the management approach taken, to prevent recruitment failure of the stock or other negative impacts that are likely to be irreversible or very slowly reversible.	
Evaluation Parameters		**Met?**
Process: *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.*		☑

EVIDENCE:

Sablefish

The Alaska Department of Fish and Game (ADFG) and the Board of Fisheries (BoF) are management organizations that are directly involved in promoting and ensuring effective conservation of the sablefish resource in state waters. ADFW representatives are members of NPFMC and NOAA Fisheries committees and subsidiary bodies thus ensuring that state-specific resource conservation needs and objectives are carefully considered in management plans and appropriately integrated where necessary.

Meetings of the BoF are organized on a three-year meeting cycle and generally occur 4 to 6 times from October through March in communities around the state to consider proposed changes to fisheries regulations. The BoF's main role is to conserve and develop the fishery resources of the state. This involves setting seasons, bag limits, methods and means for the state's subsistence, commercial, sport, guided sport, and personal use fisheries, and it also involves setting policy and direction for the management of the state's fishery resources. The Board is charged with making allocative decisions, and the ADFG is responsible for management based on those decisions. It maintains the practice of ensuring that its meetings, web conferences and information are well populated with relevant material to facilitate its communications with the public, stakeholders, and partners with respect to its discussions and decisions.

The review of certain regulatory proposals affecting the sablefish fishery may require the participation of both the Board and the NPFMC. This process is enabled by the Joint Protocol Committee (JPC). The JPC operates in accordance with its terms of reference that were revised in 2009.7 It meets as needed to review and discuss areas of mutual interest. The council and board alternate serving as host for the meeting. The JPC last met in November 2020 to consider amendments to the commercial salmon fishery in the Cook Sound Area (federal waters). The meeting's record of discussion including written comments and oral testimonies were also published on the Board's website.

Pacific Halibut

The International Pacific Halibut Commission (IPHC) is an international organization established by a Convention between Canada and the United States of America. The Convention was concluded in 1923 and entered into force that same year. The Convention has been revised several times since, to extend the Commission's authority and meet new conditions in the fishery. The most recent change occurred in 1979 and involved an amendment to the 1953 Halibut Convention. The amendment, termed a "protocol", was precipitated in 1976 by both countries extending their jurisdiction over fisheries resources to 200 miles. The 1979 Protocol along with the U.S. legislation gave effect to the Protocol (*Northern Pacific Halibut Act of 1982*).

1.3.	**Where transboundary, shared, straddling, highly migratory, or high seas stocks are exploited by two or more States (neighboring 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.**

The IPHC consists of 6 subsidiary bodies whose responsibilities are defined in the IPHC's Rules of Procedure. The bodies include: (i) Management Strategy Advisory Board (MSAB), (ii) Scientific Review Board (SRB), (iii) Research Advisory Board (RAB), (iv) Conference Board (CB), (v) Processor Advisory Board, and (vi) Finance and Administration Committee (FAC).

- The MSAB oversees and advises the Commission's staff on the IPHC's Management Strategy Evaluation (MSE).
- The SRB provides an independent scientific review of Commission science products and programs and supports and strengthens the stock assessment process.
- The RAB offers suggestions to the Executive Director and staff on where Commission research should focus.
- The CB conveys to the IPHC the perspectives of commercial and recreational fishers on Commission proposals presented at Annual Meetings.
- The PAB lends its opinion regarding Commission proposals and offers recommendations at Annual Meetings.
- The FAC advises the Commission on administrative and financial matters as remitted to it by the Commission, including annually examining the operating budget for the current year and the draft budgets for the ensuing and following years.

The Commission's strategic objectives are intended to develop the stocks of Pacific halibut in the Convention waters to those levels which will permit the optimum yield from the fishery and to maintain the stocks at those levels. Since its inception, the Commission has entered into a number of arrangements with other institutions, either to conduct activities in cooperation or to facilitate exchange of information that would enhance the output of both organizations. Currently, there exists a Memorandum of Agreement between the Commission, NOAA Fisheries and the ADFG in regard to Interagency Electronic Reporting System - eLandings.

The sustainable total exploitation of the Pacific Halibut resource across the IPHC's Convention Area and other strategic objectives are informed by the IPHC's Research and Monitoring activities that are directed towards: i) improving the annual stock assessment and quota recommendations; ii) developing information on current management issues; and iii) contributing to improve the knowledge of the biology and life history of Pacific halibut. These activities are directed by a 5-Year Program of Integrated Research and Monitoring (2022-2026).

Current Status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

Sablefish

Sablefish are managed under Tier 3 of NPFMC harvest control rules. The updated point estimate of B40%, is 118,140 t. Since projected female spawning biomass (combined areas) for 2022 is 128,789 t (equivalent to B44%), sablefish is in sub-tier "a" of Tier 3. Spawning biomass is projected to continue to increase rapidly in the near-term reaching B44% in 2022 and B51% in 2023. The updated point estimates of F40% and F35% from this assessment are 0.080 and 0.094, respectively. Thus, the maximum permissible value of FABC under Tier 3a is 0.080, which translates into a 2022 maximum permissible ABC (combined areas) of 34,863 t. The OFL fishing mortality rate is 0.094, which translates into a 2022 OFL (combined areas) of 40,432 t. Thus, current model projections indicate that the Alaskan sablefish stock is not subject to overfishing, not overfished, and not approaching an overfished condition.

On February 24, 2022, NMFS on advice from the NPFMC published in the Federal Registry the final 2022 and 2023 harvest specifications, apportionments, and Pacific halibut prohibited species catch limits for the groundfish fishery of the Gulf of Alaska (GOA). This action established harvest limits for groundfish during the remainder of the 2022 and the start of the 2023 fishing years and to (i) accomplish the goals and objectives of the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMP), and (ii) to conserve and manage the groundfish resources in the GOA in accordance with the *Magnuson-Stevens Fishery Conservation and Management Act* (Magnuson-Stevens Act, 16 U.S.C. 1801 et seq.).

The harvest specifications and related closures are effective from March 2, 2022, to December 31, 2023. The sum of the TAC amounts is 448,118 mt for 2022; for 1023, the sum of the TAC amounts is 443,615 mt. The final 2022 and 2023 OFLs and ABCs are based on

1.3.	Where transboundary, shared, straddling, highly migratory, or high seas stocks are exploited by two or more States (neighboring 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.

the best available biological information, including projected biomass trends, information on assumed distribution of stock biomass, and revised methods used to calculate stock biomass, and the final 2022 and 2023 TACs are based on the best available biological and socioeconomic information.

Pacific Halibut

Annually, the NPFMC's harvest specifications process is to apply the harvest strategy to the best available scientific information to derive annual harvest specifications. The Council's Groundfish Plan Teams and Scientific and Statistical Committee (SSC) use stock assessments to calculate biomass, overfishing levels, and acceptable biological catch (ABC) limits for each species or species group for specified management areas. Overfishing levels and ABCs provide the foundation for the Council and NMFS to develop the total allowable catch (TAC) for each species or species group. Overfishing levels and ABC amounts reflect fishery science, applied considering the requirements of the FMPs. The TACs recommended by the Council are either at or below the ABCs. The sum of the TACs for each area (the BSAI or GOA) is constrained by the optimum yield established for that area. The annual harvest specifications also set or apportion the prohibited species catch (PSC) limits.

When new or significant adjustments are under consideration that affect the FMPs, the NPFMC's Groundfish Plans Teams of experts, together with NOAA's teams, are required to carry out a detailed Environmental Impact Statement (EIS) of the effects of the adjustments within the action areas i.e., target species, non-specific species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, economy, and environmental justice. The product of this collaboration - a Supplementary Information Report (SIR) - evaluates the need to prepare a Supplemental EIS (SEIS) for the 2022 and 2023 groundfish harvest specifications. In short, a SEIS should be prepared if (i) the agency makes substantial changes in the proposed action that are relevant to environmental concerns, or (ii) significant new circumstances or information exist relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR 1502.9(d)(1)).

Evidence Basis: *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.*	☑

EVIDENCE:

The availability and adequacy of the evidence is sufficient to substantiate that the requirement of the supporting clause is met by the international, federal and state organizations whose mandates are to ensure effective conservation and management of the Pacific Halibut and Sablefish stocks and fisheries in question. Evidence of this is found on IPHC Rules of procedure, collective agreement IPHC NMFS ADFG, 5 year integrated research and monitoring plan. Please see supported evidence on the references

References:

1. https://www.iphc.int/uploads/pdf/basic-texts/iphc-rop-current.pdf
2. https://iphc.int/uploads/pdf/documents/mou/iphc-moa-noaa-adfg-25-jan-2022-to-25-jan-2027.pdf
3. https://iphc.int/uploads/pdf/5yrirm/iphc-2022-5yrirm.pdf
4. https://www.govinfo.gov/content/pkg/FR-2022-03-02/pdf/2022-03844.pdf
5. https://www.npfmc.org/wp-content/PDFdocuments/meetings/JointProtocol1209.pdf

	Starting score		Number of EPs NOT met			=	Overall score
Numerical score:	10	– (	0	X	3)	=	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**

9.2.1.5 Supporting Clause 1.3.1.

1.3.1.	**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.**

Relevance:	Relevant
	Note. This clause pertains only if stock is transboundary, shared, straddling, highly migratory, or high seas. Otherwise, this clause is not applicable. This clause is justified by the evidence provided in clause 1.2. Compatibility of management measures does not mean identical management measures, but the approach shall be consistent with respect to the overall management and conservation goals of the stock.

Evaluation Parameters	**Met?**
Process: *Identification of common objectives for maintenance of stock biomass.*	☑

EVIDENCE:

Sablefish

Sablefish are managed under Tier 3 of NPFMC harvest control rules. As a result of the 2021 stock assessment update, the updated point estimate of B40%, is 118,140 t. Since projected female spawning biomass (combined areas) for 2022 is 128,789 t (equivalent to B44%), sablefish is in sub-tier "a" of Tier 3. Spawning biomass is projected to continue to increase rapidly in the near-term, reaching B44% in 2022 and B51% in 2023. The updated point estimates of F40% and F35% from this assessment are 0.080 and 0.094, respectively. Thus, the maximum permissible value of F_{ABC} under Tier 3a is 0.080, which translates into a 2022 maximum permissible ABC (combined areas) of 34,863 t. The OFL fishing mortality rate is 0.094, which translates into a 2022 OFL (combined areas) of 40,432 t. Thus, current model projections indicate that the Alaskan sablefish stock is not subject to overfishing, not overfished, and not approaching an overfished condition.

Pacific Halibut

The results of the 2021 stock assessment indicate that the Pacific halibut stock declined continuously from the late 1990s to around 2012. That trend is estimated to have been largely a result of decreasing size-at-age, as well as somewhat weaker recruitment strengths than those observed during the 1980s. The spawning stock biomass (SSB) is estimated to have increased gradually and then decreased to an estimated 191 million pounds (~86,600 t) at the beginning of 2022, with an approximate 95% credible interval ranging from 129 to 277 million pounds (~58,700-125,400 t).

The projections for this assessment are more optimistic than those from the 2019 and 2020 assessments due to the increasing projected maturity of the 2012 year-class. This translates to a lower probability of stock decline for 2022 than in recent assessments as well as a decrease in this probability through 2023-24. There is greater than a 50% probability of stock decline in 2023 (55-64/100) for the entire range of SPR values from 40-46%, which include the status quo TCEY and the F43% reference level. The 2022 "3-year surplus" alternative, corresponds to a TCEY of 38.0 million pounds (~17,240 t), and a projected SPR of 48% (credible interval 32-63%). At the reference level (a projected SPR of 43%), the probability of spawning biomass'decline from 2022 to 2023 is 59%, decreasing to 55% in three years, as the 2012 cohort matures. The one-year risk of the stock dropping below SB30% ranges from 43% at the F46% level to 45% at the at the F40% level of fishing intensity.

FMPs for Alaska's Groundfish fisheries of the BSAI and the GOA must be consistent within the 10 National Standards (NS) for Conservation and Management as set out in the MSA as amended (16 U.S.C. § 1851). Regarding the maintenance of stock biomass, NS 1 states: "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry."

As part of its Management policy, the Council is required 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

1.3.1.	**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.**

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.

Management objectives for the groundfish fisheries are reviewed annually and adjusted as necessary. The nine objectives serve as guideposts and are informed by 46 components. They include: (i) Prevent overfishing, (ii) Promote sustainable fisheries and communities, (iii) Preserve the food web, (iv) Manage incidental catch and reduce bycatch and waste, (v) Avoid impacts to seabirds and marine mammals, (vi) Reduce and avoid impacts to habitat, (vii) Promote equitable and efficient use of fishery resources, (viii) Increase Alaska Native consultation, and (ix) Improve data quality, monitoring and enforcement.

Current status/Appropriateness/Effectiveness: *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).*	☑

EVIDENCE:

Sablefish

The Alaska Department of Fish and Game (ADFG) evaluates the fishery's stock status and establishes the Northern Southeast Inside (NSEI) and Southern Southeast Inside (SSEI) acceptable biological catches (ABC) and subsequent annual harvest objectives (AHO). For the NSEI Subdistrict management area, the 2022 commercial sablefish fishery AHO is 1,233,633 round pounds. The AHO is based on the sablefish ABC with decrements made for sablefish mortality in other fisheries. The recommended 2022 ABC is 1,443,314 round pounds (F_{ABC} = 0.056), a 15% increase from the 2021 ABC and the maximum allowable increase in a given year.

After three decades of declining or suppressed spawning stock biomass in the North Pacific, persistent high NSEI catch rates of small sablefish in recent years across multiple surveys and fisheries signal strong recruitment and increasing trends for the stock.

In March 2022, the Alaska BoF adopted new regulations for the NSEI sablefish commercial fishery. These new regulations included:

- Full retention requirements and landing requirements using hook-and-line and pot gear for all species of rockfish including thornyhead rockfish.
- Allowing pot gear as a legal gear type in addition to longline gear for the C61A permits, which is contingent upon the approval process through CFEC.
- If pot gear is approved as a legal gear type for the C61A permits, pots must have at least two circular escape rings, with a minimum inside diameter of three and three-fourths inches, installed on opposing vertical or sloping walls of the pot.

Examples of other sablefish management measures include (i) mandatory registration and logbook requirements (ii) retention limits from the directed fishery, (iii) mandatory use of fish tickets, (iv) bycatch allowances for other species, (v) gear restrictions, and (vi) the operator of a vessel taking sablefish in the NSEI area shall unload those sablefish before taking sablefish in another area.

For the SSEI sablefish management area, the 2022 SSEI AHO is 643,360 round lb, a 7% increase from the 2021 AHO. Positive indicators for sablefish in SSEI include a 7% increase in the longline survey CPUE from 2020 to 2021 and continued strong recruitment from the 2014, 2016, 2017, and 2018 age classes in SSEI as well as other sablefish fisheries in neighboring geographic areas. Longline fishery CPUE decreased 23% while pot fishery CPUE increased 29%, most likely due to the considerable shift from longline to pot gear usage in 2021. The recommended increase in the AHO will continue to provide fishery stability and sustainability through conservative management action.

In March 2022, the BoF adopted new regulations for the SSEI sablefish commercial fishery. The new regulations will require:

- Pots must have at least two circular escape rings, with a minimum inside diameter of three and three-fourths inches, installed on opposing vertical or sloping walls of the pot.
- Full retention requirements and landing requirements using hook-and-line and pot gear for all species of rockfish including thornyhead rockfish.

1.3.1.	**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.**

SSEI sablefish management measures are similar to those in the NSEI and include: (i) mandatory registration and logbook requirements, (ii) retention limits from the directed fishery, (iii) mandatory use of fish tickets, (iv) bycatch allowances for target and other species, (v) gear restrictions, and (vi) the operator of a vessel taking sablefish in the SSEI area shall unload those sablefish before taking sablefish in another area.

Pacific Halibut

The NPFMC's annual harvest specifications process is to apply the harvest strategy to the best available scientific information to derive annual harvest specifications. The specifications are reflective of the federal common objectives for the fishery and are established following a rigorous process of data collection, data analyses, federal-state consultation, and decision-making.

The Council's Groundfish Plan Teams (GOA and BSAI) meet twice annually - the first prior to Council's October meeting, and the second prior to the Council's December meeting. The Plan Teams compile annual Stock Assessment and Fishery Evaluation (SAFE) reports that provide the Council with a summary of the most recent biological condition of the groundfish stocks and the social and economic condition of the fishing and processing industries. The SAFEs comprise the best available scientific information on the condition of the groundfish stocks and include overfishing level (OFL) and acceptable biological catch (ABC) recommendations for the Council's groundfish fisheries. Overfishing levels and ABCs provide the foundation for the Council and NMFS to develop the total allowable catch (TAC) for each species or species group. Overfishing levels and ABC amounts reflect fishery science, applied considering the requirements of the FMPs. The TACs recommended by the Council are either at or below the ABCs. The sum of the TACs for each area (the BSAI or GOA) is constrained by the optimum yield established for that area. The annual harvest specifications also set or apportion the prohibited species catch (PSC) limits.

Alaska state representatives are members of both Groundfish Plan Teams and the SSC thus facilitating the development and implementation of common objectives and management approaches for the fisheries in state waters.

Management measures for the Groundfish fisheries of the BSAI and GOA are well defined. They are listed in Table ES - 2 of the FMPs for both management areas.

Evidence Basis: *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.*	☑

EVIDENCE:

The availability and adequacy of the evidence is sufficient to substantiate that supporting clause 1.3.1 is met as supported by detailed stock assessment reports and FMPs.

Evidence of this is found on the IPHC halibut stock assessment, Interim IPHC Harvest Strategy and Policy, stock assessment of sablefish, BSAI and GOA FMP among other documents

Please see supported evidence on the references.

References:

1. https://iphc.int/uploads/pdf/sa/2022/iphc-2022-sa-01.pdf
2. https://iphc.int/uploads/pdf/hsp/iphc-2020-inthsp.pdf
3. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/sablefish.pdf
4. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
5. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
6. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
7. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
8. https://www.adfg.alaska.gov/FedAidPDFs/RIR.1J.2022.19.pdf
9. https://www.adfg.alaska.gov/FedAidPDFs/RIR.1J.2022.18.pdf

1.3.1.	**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.**									
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**

9.2.1.6 Supporting Clause 1.4.

1.4.	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.
Relevance:	Not relevant
	Note: This clause pertains only if stock is transboundary, shared, straddling, highly migratory, or high seas. Otherwise, this clause is not applicable. This clause is justified by the evidence provided in clause 1.2.

Evaluation Parameters	**Met?**
Process: *There is ongoing cooperation in stock assessment, data sharing, and other activities.*	☐
EVIDENCE: **Pacific Halibut** Supporting Clause 1.4 is not relevant because the US (and Canada) are members and participants of the IPHC as set forth in the IPHC Convention. **Sablefish** Supporting Clause 1.4 is not relevant since the principal federal and state resource management agencies are full participants in all aspects of the federal-state management system.	
Current status/Appropriateness/Effectiveness: *Relevant measures are implemented by non-member States.*	☐
EVIDENCE:	
Evidence Basis: *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.*	☐
EVIDENCE:	

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

9.2.1.7 Supporting Clause 1.4.1

1.4.1.	**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.**	
Relevance:	Relevant	
	Note: This clause pertains only if stock is transboundary, shared, straddling, highly migratory, or high seas. Otherwise, this clause is not applicable. This clause is justified by the evidence provided in clause 1.2.	
Evaluation Parameters		**Met?**
Process: *There is a history of prior consultation.*		☑
EVIDENCE: **Pacific Halibut and Sablefish** The consultation practices of the principle federal and state resource management agencies for the Pacific Halibut and Sablefish commercial fisheries are well established and effective. Committees and sub-committees all have mandates to engage stakeholders and the public in ways that are open, transparent and accountable. In most cases, the processes are defined by statute and informed by principles, goals and objectives. Meeting minutes reflect the outcomes of discussions including public comments.		
AllCurrent status/Appropriateness/Effectiveness: *The views of the managing fishery organization are taken into account.*		☑
EVIDENCE: **Public Halibut and Sablefish** The consultation and engagement practices are led by the managing fishery organizations themselves. Their views are taken into account.		
Evidence Basis: *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 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.*		☑
EVIDENCE: The availability and quality of the evidence are sufficient to substantiate that the key federal and state resource management agencies seek to affect conservation and management through cooperative and collaborative actions with a broad range of other parties including other governmental agencies, interested stakeholders and the general public. Evidence of this is found on IPHC, NPFMC, NOAA Fisheries and ADFG/AKBoF terms of reference, consultation practices and principles; statutory requirements, strategic plans and objectives		
References:	1. IPHC, NPFMC, NOAA Fisheries and ADFG/AKBoF terms of reference, consultation practices and principles; statutory requirements, strategic plans and objectives.	

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

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

9.2.1.8 Supporting Clause 1.5.

1.5.	**The applicant's fishery 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.**
Relevance:	Relevant **Note:** This clause pertains only if stock is transboundary, shared, straddling, highly migratory, or high seas. Otherwise, this clause is not applicable. This clause is justified by the evidence provided in clause 1.2.

Evaluation Parameters	**Met?**
Process: *The extent to which a formal process or system is available.*	☑
EVIDENCE: **Pacific Halibut and Sablefish** Within the key federal and state resource management agencies, there is ongoing engagement and cooperation between representatives to the standing committees and subordinate bodies on all fisheries management and scientific aspects. For example, the representatives share species-specific biological and socioeconomic data and analyses, develop new management measures and evaluate their impacts and performance, and coordinate new rule-making initiatives. Enforcement activities are frequently undertaken jointly under the auspices of Joint Enforcement Agreements. These aspects are known and proven to foster inter-jurisdictional and inter-agency cooperation.	
Current Status/Appropriateness/Effectiveness: *Level of activity, application, and level of engagement.*	☑
EVIDENCE: **Pacific Halibut and Sablefish** All key federal and state resource management agencies engage in planning activities that produce, *inter alia*, multi-year strategic plans that reflect their forward priorities for fisheries research (fish stocks, habitat protection, ecological and climate change), development, and enforcement while also identifying the new initiatives that will be pursued to strengthen their respective governance and operational frameworks. The level of engagement is continuous throughout the fiscal year and across the organizations' various policy, technical, scientific, and economic bodies.	
Evidence Basis: *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).*	☑
EVIDENCE: **Pacific Halibut and Sablefish** The evidence provided above including evidence for Fundamental Clauses 1.1, 1.2 and 1.3 and Supporting Clauses 1.2.1, 1.3.1, and 1.4.1 is sufficient to substantiate that both fishery management systems foster active inter-jurisdictional and inter-agency cooperation on fishery matters.	

References:	1. References previously cited for the aforementioned FCs and SCs.							
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**

9.2.1.9 Supporting Clause 1.6.

1.6.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *There is an agreed-upon system to finance the fishery management organizations and arrangements.*	☑

EVIDENCE:

Federal Organizations

IPHC budgetary appropriations are granted by the US Congress and the Canadian Parliament as provided by the Convention. Appropriations to other federal agencies like NOAA Fisheries (NMFS) are subject to statutory provisions as set forth in the MSA (or other statutes) and the Congressional budgetary appropriations process. Alaska state agencies undergo a similar Fiscal year review and approval process by their Legislature.

Alaska Department of Fish and Game

The operating and capital budget of the ADFG consists of a variety of funding sources, including federal receipts, general fund receipts, fish and game fund receipts, and several other sources. All of the state budgets are submitted through the State Office of Management and Budget (OMB) and funded by the state legislature. In addition, state enforcement activities are routinely enhanced by NOAA Fisheries (NMFS) via Joint Enforcement Agreements that are intended to supplement state enforcement of federal laws but may include non-operational activities such as new asset acquisitions or replacements, and enhanced training.

Current status/Appropriateness/Effectiveness: *The fishery management organizations and arrangements are currently financed using a cost recovery or other system.*	☑

EVIDENCE:

Pacific Halibut and Sablefish

In 1996, the *Magnuson-Stevens Act* (MSA) was amended to, among other purposes, require the Secretary of Commerce to "collect a fee to recover the actual costs directly related to the management and enforcement of any individual quota program." This requirement was further amended in 2006 to include collection of the actual costs of data collection and to replace the reference to "individual quota program" with a more general reference to "limited access privilege program" at § 304(d)(2)(A) of the Act. Section 304(d)(2) of the Act also specifies an upper limit on these fees, when the fees must be collected, and where the fees must be deposited.

NOAA Fisheries (NMFS) and PFMC are funded by Congressional appropriation and cost recovery from limited access privilege programs, as required by the MSA. Annually, NOAA Fisheries publishes the individual fishing quota standard prices and fee percentage for cost recovery for the IFQ Program for the Pacific halibut and sablefish fisheries of the North Pacific. The percentage fee for 2021 was 2.3%. This action is intended to provide holders of halibut and sablefish IFQ permits with the standard prices and fee percentage to calculate the required payment for IFQ cost recovery fees due on or before the date in the notice. The total dollar amount of the fee is determined by multiplying the NMFS published fee percentage by the ex-vessel value of all IFQ landings made on the permit(s) during the IFQ fishing year.

Evidence Basis: *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.*	☑

1.6.	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.

EVIDENCE:

Fishery Management Organizations

The evidence is sufficient to substantiate that there are arrangements in effect in regard to means to finance the costs of federal and state fisheries management activities and that these finances are forthcoming by regulation and appropriation.

Evidence of this is found on information of the IFQ and about the budget sections of ADFG

References:	1. https://www.federalregister.gov/documents/2021/12/29/2021-28292/fisheries-of-the-exclusive-economic-zone-off-alaska-north-pacific-halibut-and-sablefish-individual 2. https://www.adfg.alaska.gov/index.cfm?adfg=about.budgets

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**

9.2.1.10 Supporting Clause 1.6.1.

1.6.1.	**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.**	
Relevance:	Not relevant	
	Note: The fishery for the *stock under consideration* occurs outside the exclusive economic zone (EEZ), there is evidence of flags of convenience, and evidence of illegal, unreported, and unregulated (IUU) fishing. Not applicable otherwise.	
Evaluation Parameters		**Met?**
Process: *There is a system that encourages banks to require vessels to be flagged within the jurisdiction of interest.*		☐
EVIDENCE: The Supporting clause is not relevant because the Pacific Halibut and Sablefish fisheries do not operate outside of the U.S. EEZ and all vessels operating in the fisheries must be US owned and licensed.		
Current Status/Appropriateness/Effectiveness: *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.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

Numerical score:	**Starting score**	– (	**Number of EPs NOT met**	x 3) =	**Overall score**
	10				NA

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

9.2.1.11 Supporting Clause 1.7.

1.7.	**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.**
Relevance:	Relevant
Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

Federal organizations

The IPHC, NOAA Fisheries and the NPFMC have procedures at multiple levels to undertake periodic reviews of their mandated programs, measures, and activities. They employ an adaptive management approach at the national (and international) level of the Pacific Halibut and Sablefish fisheries to inform their routine periodic reviews. All three agencies conduct assessments and research related to fishery impacts on ecosystems and habitats and how environmental factors affect the fishery. Findings and conclusions are published in the Ecosystem section of the SAFE documents, annual Ecosystem Considerations documents, and various other research reports. For example:

- The IPHC's SRB is mandated by the Commission's Rules of Procedure (2022; Appendix VIII, Sect.1, para.1-3) to provide an independent scientific peer review of the Commission science/research proposals, programs, and products, including but not limited to:
  a. Data collection
  b. Historical data sets
  c. Stock assessment
  d. Management Strategy Evaluation
  e. Migration
  f. Reproduction
  g. Growth
  h. Discard survival
  i. Genetics and Genomics

  The SRB is also required to undertake periodic reviews of science/research strategy, progress, and overall performance, as to review the recommendations arising from the MSAB and the RAB.

- NOAA Fisheries - Alaska Region's Strategic Plan 2020-2023 emphasizes the important of working collaboratively with the IPHC, State of Alaska entities, stakeholders, and the public in operationalizing its overarching strategies which include: (i) Amplifying the economic value of commercial and recreational fisheries while ensuring their sustainability, (ii) Conserving and recovering protected species while supporting responsible fishing and resource development. The former includes managing stocks for optimum yield; adequately assessing all prioritized stocks and maintaining information for currently assessed stocks; and promoting ecosystem-based fishery management. The later strategic objective includes: stabilizing highest priority protected species; and minimizing bycatch and entanglement of protected species while supporting fisheries.

- The NPFMC's revised Statement of Organization, Practices and Procedures (2020) is required by Section 302(f)(6) of the MSA. The Council is mandated to "review on a continuing basis, and revise as appropriate, the assessments and specifications

1.7.	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.

contained in each FMP for each fishery within its geographical area." The Council's SSC is required to "provide ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, overfishing limits, maximum sustainable yield, and achieving rebuilding targets, and report on stock status and health, bycatch, habitat status, social and economic impacts of management measures, and sustainability of fishing practices." Moreover, the SSC will "provide expert scientific and technical advice to the Council on the development of fishery management policy, fishery management plans and amendments, their goals and objectives, proposed regulations, and criteria for judging plan effectiveness."

- The NPFMC's harvest specifications process is to apply the harvest strategy to the best available scientific information to derive annual harvest specifications. The Council's Groundfish Plan Teams and Scientific and Statistical Committee (SSC) use stock assessments to calculate biomass, overfishing levels, and acceptable biological catch (ABC) limits for each species or species group for specified management areas. Overfishing levels and ABCs provide the foundation for the Council and NMFS to develop the total allowable catch (TAC) for each species or species group. Overfishing levels and ABC amounts reflect fishery science, applied considering the requirements of the FMPs. The TACs recommended by the Council are either at or below the ABCs. The sum of the TACs for each area (the BSAI or GOA) is constrained by the optimum yield established for that area. The annual harvest specifications also set or apportion the prohibited species catch (PSC) limits. When new or significant adjustments are under consideration that affect the FMPs, the NPFMC's Groundfish Plans Teams of experts, together with NOAA's teams, are required to carry out a detailed Environmental Impact Statement (EIS) of the effects of the adjustments within the action areas on for example, target species, non-specific species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, economy, and environmental justice. The product of this collaboration - a Supplementary Information Report (SIR) - evaluates the need to prepare a Supplemental EIS (SEIS) for the 2022 and 2023 groundfish harvest specifications. In short, a SEIS should be prepared if (i) the agency makes substantial changes in the proposed action that are relevant to environmental concerns, or (ii) significant new circumstances or information exist relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR 1502.9(d)(1)).

- The NPFMC's decision in April 2022 to seek amendments to parts of the IFQ/CDQ Programs triggered an EA/RIR of the proposed management measures that would apply to fishery participants in the Pacific halibut and sablefish Individual Fishing Quota (IFQ) and Community Development Quota (CDQ) Programs as required by the MSA. The amendments were evaluated in relation to alternatives, elements, and options.

- In February 2022, the NMFS on advice from the NPFMC published in the Federal Registry the final 2022 and 2023 harvest specifications, apportionments, and Pacific halibut prohibited species catch limits for the groundfish fishery of the Gulf of Alaska (GOA). This action established harvest limits for groundfish during the remainder of the 2022 and the start of the 2023 fishing years and to (i) accomplish the goals and objectives of the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMP), and (ii) to conserve and manage the groundfish resources in the GOA in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act, 16 U.S.C. 1801 et seq.).

- The NPFMC's SSC is currently completing their assigned tasks in regard to the mandated Essential Fish Habitat 5-year review. In February 2022, the SSC reported on progress with assessing EFH component 1 (descriptions and maps of EFH by species), and EFH component 2 (the effects of fishing on EFH).

State organizations

- Moderate changes to the AK Sablefish assessment methodology (December 2021) were introduced to account for the harvest control rule (HCR) that had been deemed unreliable for sablefish due to overly optimistic population growth forecasts. For the 2021 SAFE, multiple model updates were developed, including refinements to the biological inputs, new selectivity and catchability parametrizations, and improved data reweighting approaches, all of which have helped to address retrospective patterns. The final proposed model for the 2021 SAFE, *21.12_Proposed_No_Skip_Spawn*, resolves the recruitment estimation issues associated with the previous model such that maximum ABC projections are once again deemed adequate for the basis of management advice.

1.7.	**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.**

- For 2022 and 2023, Alaska's BoF established the guideline harvest level (GHL) for vessels using pot gear in State waters in the Bering Sea subarea (BS) equal to 11% of the Pacific cod ABC in the BS. The State's pot gear GHL for the BS will increase 1 annually up to 15%t of the BS ABC, if 90% of the GHL is harvested by November 15 of the preceding year. If 90% of the 2022 BS GHL is not harvested by November 15, 2022, then the 2023 BS GHL will remain at the same percentage as the 2022 BS GHL (11%). If 90% of the 2022 BS GHL is harvested by November 15, 2022, then the 2023 BS GHL will increase by 1% and the 2023 BS TAC will be set to account for the increased BS GHL. Also, for 2021 and 2022, the BoF established an additional GHL for vessels using jig gear in State waters in the BS equal to 45 mt of Pacific cod in the BS.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
Federal and State organizations
The information and examples listed above illustrate that the principal management organizations are systematically involved in the continuous review and adaptation of measures to ensure they achieve the specific management objectives they are designed to achieve and are revised and updated as appropriate.

Evidence Basis: *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.*	☑

EVIDENCE:
The availability and adequacy of the evidence (situational examples) is sufficient to substantiate that within the federal and state fishery management systems, 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 light of new information.
Evidence of this is found on the sablefish stock assessment, Report of the 21st Session of the IPHC Scientific Review Board (SRB02), on the statement of organization, practices and procedures of the NPFMC, and the NOAA Alaska strategy plan
Please see supported evidence on the references.

References:	1. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/sablefish.pdf 2. https://iphc.int/uploads/pdf/srb/srb021/iphc-2022-srb021-r.pdf 3. https://www.npfmc.org/wp-content/PDFdocuments/membership/Council/NPFMC_SOPP_June2020.pdf 4. https://media.fisheries.noaa.gov/dam-migration/noaa_alaska_spupdate.pdf

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**

9.2.1.12 Supporting Clause 1.8.

1.8.	The management arrangements and decision-making processes for the fishery shall be organized in a transparent manner.
Relevance:	Relevant

Evaluation Parameters	Met?
Current status: *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.*	☑

EVIDENCE:

Federal management arrangements

Arrangements for the Pacific Halibut and Sablefish commercial fisheries are widely publicized on the NPFMC and NOAA Fisheries and websites, both nationally and regionally. Law enforcement arrangements are available publicly for NOAA-OLE and USCG national and regionally, and ADPS-AWT statewide.

A. NPFMC processes

Within the Council's management processes are many procedural elements that inform and promote transparency of management arrangements. Examples include:

- Published timely notices of all committee and subordinate committee meetings, meeting agendas, backgrounders and presentations with joining instructions and public participation guidelines; terms of reference and objectives; three meeting outlook.
- Regular dissemination of the newsletters, press releases, blogs and social media feeds.
- Identification of committees membership, affiliation and contact information, appointment terms, members' conflict of interest and ethics guidelines.
- Publication of FMPs and amendments; publication of proposed and final Council rules in the U.S. Federal Register to allow for public comment. All comments to final rules receive a written response. A Record of Decision explains the rationale for NMFS action.

B. NOAA Fisheries – NMFS processes

NOAA's Alaska Region's management processes are similar to the Council's above. Examples include:

- Published notices and rules including those open for public comment.
- Regular dissemination of bulletins, feature stories, upcoming events, blogs and social media feeds.
- Publication of FMPs and amendments; publication of proposed and final Council rules in the U.S. Federal Register to allow for public comment. All comments to final rules receive a written response. A Record of Decision explains the rationale for NMFS action.

State management arrangements

Arrangements for the Pacific Halibut and Sablefish commercial fisheries are widely publicized on the ADFG and ABoF websites. Law enforcement arrangements are available publicly on the ADPS-AWT website.

A. Alaska Department of Fish and Game processes

The Department's processes include published media releases, brochures, newsletters, regulation announcements, news releases, emergency orders, hot topics and issues, and Board actions and activities.

B. Alaska Board of Fisheries processes

The Board's processes include published (i) notices of public meetings, (ii) notices of work sessions, (iii) notices of NPFMC/ABoF Joint Protocol meetings notices, (iv) notices of proposed regulatory changes, and (v) multi-year meeting schedule. Board meetings include agendas and documents, departmental reports, and emergency petitions. The agency's management processes are subject to compliance with the provisions of Article 6 of the State's *Administrative Procedures Act*.

1.8.	The management arrangements and decision-making processes for the fishery shall be organized in a transparent manner.

Effectiveness: *There is transparency in decision-making processes.*	☑

EVIDENCE:

International management decision-making

A. IPHC

In recent years, the IPHC progressively decided to treat all meetings (Commission and its subsidiary bodies) as open unless specifically closed (sessions pertaining to personnel remain closed). All sessions are also live webcast to the public and the web broadcast incorporates the ability to receive questions from and respond to the on-line audience. Audio recordings of all sessions are also published on the website, and youtube channels for the public record. In session, all attendees, including observers and members of the public, as well as the webinar audience are able to pose questions and have them answered by the Commission in two-way dialogue during the meeting. The IPHC's Rules of Procedures stipulate that:

- Meeting invitations for Commission and subsidiary body meetings are issued not later than 90 days in advance of the session;
- All documents for Commission and subsidiary body meetings are prepared in a standard format and posted at the IPHC website.
- Documents prepared for meetings are posted not later than 30 days in advance of the session, and a comprehensive meeting report is posted as quickly as possible following each session
- The timing of the IPHC annual meeting cycle, with major decisions made by the Commission in January or early February of each year, is geared to support the needs of the domestic regulatory processes for the Pacific halibut fisheries in both Contracting Parties.

The IPHC's allocations decision-making is informed by stock assessments conducted by scientific staff and consulted on annually by several advisory bodies including the Conference Board, the Processor Advisory Group, the Research Advisory Board, the Management Strategy Advisory Board, the Scientific Review Board and the Management Strategy Evaluation Board which uses performance metrics in its management performance evaluation. The IPHC holds an annual meeting and encourages public participation in management via the organization's five advisory bodies that meet throughout the year.

Either Contracting Party may choose to object and thus not enact specific IPHC fishery regulations. Consent by both Parties is required to adopt a new regulatory measure. In instances where agreement is not reached, the Parties will enter into an inter-sessional discussion process. Should agreement still not be reached, the decision is moved to the next session of the Commission for deliberation. At that point, only 2 Commissioners from each Contracting Party (4 in total) are required to be in favour for a decision to be adopted.

Regulations adopted by the IPHC remain in force until changed or superseded by the Commission. The IPHC Convention requires that in session, all decisions of the Commission shall be made by a concurring vote of at least two of the [three] Commissioners of each Party. In the absence of such an agreement, existing regulations remain in force, thus the operation of the fisheries is not hampered or restricted in the event the Commission fails to update regulations. The Commission strives to avoid this situation and it is rare, occurring only twice in the past 96 years. Extent to which IPHC has transparent and consistent decision-making procedures that facilitate the adoption of management regulations in a timely and effective manner.

Federal management decision-making

B. NPFMC

The *North Pacific Halibut Act* allows the Council to develop regulations, including limited access regulations, that do not conflict with the regulations adopted by the Commission (16 U.S.C. §§ 773c, (c)). Regulations recommended by the Council must be approved by the Secretary of Commerce before being implemented through the NMFS. NMFS has responsibility for managing the fishery for Halibut according to regulations approved by the Secretary. The NPFMC has a well-defined, open and participatory decision-making process; conducting public meetings allowing all interested persons an opportunity to be heard in the development of FMPs and amendments, and other Council decisions.

1.8.	The management arrangements and decision-making processes for the fishery shall be organized in a transparent manner.

The Council's decision-making process relies heavily on its Scientific and Statistical Committee, Advisory Panels, Plan/Management Teams, Workgroups, and regular public hearings to identify issues of concern for fishery managers to address. All of these groups meet regularly and report the issues of concern to the Council for consideration in its decision-making deliberations. As mandated by the MSA, and the *Administrative Procedures Act*, the process must be open and transparent, with supporting documents, minutes of meetings, and testimony published on the Council's website.

There are three key steps in the Council's decision-making process that produces the management plans and regulations to achieve its objectives: First, a Council develops a fishery management plan employing processes that proactively identify the issues and examine the implications that the proposed regulations may have beyond the fishery (other fisheries, the ecosystem, coastal communities, etc.). Second, the Secretary of Commerce evaluates the proposed plan, its wider implications, and whether it is consistent with all relevant laws. Third, NMFS, the states, and the US Coast Guard and their partners implement the provisions of the plan. According to the Council's Statement of Organization, Practices and Procedures (sub-section 3.2.4), matters pertaining to the approval or disapproval of a fishery management plan or amendment, including proposed regulations, or comments for the Secretary on foreign fishing applications, or Secretarially-prepared management plans, require a vote of Council members.

Decision-making for the Alaska Sablefish fishery occurs within the Council process, incorporating input from the NMFS, member states, and numerous industry, academic, and NGO stakeholders. The process used for sablefish is very similar to the aforementioned process for Pacific Halibut

State management decision-making

A. ABoF

The Board is a decision making body charged with making allocative and regulatory choices and rulings through the integration of scientific evidence, societal values, and economic demands. The Board's review of management plans, amendments and other regulatory changes include input from ADFG staff, Regional ADFG advisory committees, non-ADFG scientists, industry, environmental non-governmental organizations (ENGOs), stakeholders and the general public.

Regarding public participation, the BoF holds multiple public meetings each year at various locations throughout Alaska with each decision being recorded in a public forum after public comments. The BoF works with 84 advisory committees around the state which guarantees accessibility by the public and therefore the likelihood that it is exposed to all issues identified in the fishery. The structure also provides a forum for the collection and expression of regional opinions on fish issues. As such BoF reviews proposals submitted by advisory committees to change commercial fishing regulations. Given this structure, public involvement is one of the BoF's most essential aspects. For the Sablefish fishing areas that managed by the state, the BoF reviews and approves the management plan for Chatham Strait on an annual basis. The information contained in the management plan is responsive to the annual stock assessment, meaning that every year the Board reviews and approves the fishery's AHO based on the most recent assessment of the Sablefish stock, therefore responding to fluctuations in the species' population.

B. ADFG

ADFG's advisory committees, as established by the BoF, work in conjunction with the Bureau to develop regulatory proposals, evaluate and develop proposals and recommendations to the Board, and provide a public forum for fish conservation. In instances when the BoF chooses not to follow the recommendations of the local advisory committee, it must inform the committee of its action and provide the reasons for not following the proposed recommendations. The BoF provides public access to fisheries meeting information and department reports via the ADFG website.

Department reports include fisheries data supporting decisions, and the reasons why decisions were made. Publicly available documents that contain this information include the 2022 - 2023 Statewide Commercial Groundfish Fishing Regulations and the 2022 Northern and Southern Southeast Inside Subdistrict Sablefish Fishery Stock Assessments.

Evidence Basis:	☑

1.8.	**The management arrangements and decision-making processes for the fishery shall be organized in a transparent manner.**
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.	

EVIDENCE:
The availability and adequacy of the evidence is sufficient to substantiate that management arrangements and decision-making processes for the fisheries are organized in a transparent manner.
Evidence of this is found on ADFG website, Alaska Administrative Procedure Act, AK Fisheries Board website, North Pacific Management Council website, IPHC's Decision-making and dispute settlement document, statement of organization practices and procedures from NPFMC, the ADFG 2022

Please see supported evidence on the references.

References:

1. https://www.adfg.alaska.gov/index.cfm?adfg=about.main
2. https://ballotpedia.org/Alaska_Administrative_Procedure_Act#:~:text=The%20Alaska%20Administrative%20Procedure%20Act,62%20of%20the%20Alaska%20Statutes.
3. https://www.adfg.alaska.gov/
4. https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main
5. https://www.npfmc.org/
6. https://iphc.int/the-commission
7. https://www.iphc.int/uploads/pdf/priph/iphc-2019-priphc02-07.pdf
8. https://www.npfmc.org/wp-content/PDFdocuments/membership/Council/NPFMC_SOPP_June2020.pdf
9. https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2022_2023_cf_groundfish_regs.pdf
10. https://www.adfg.alaska.gov/FedAidPDFs/RIR.1J.2022.18.pdf
11. https://www.adfg.alaska.gov/FedAidPDFs/RIR.1J.2022.19.pdf

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**

9.2.1.13 Supporting Clause 1.9.

1.9.	**Management organizations not party to the Agreement to Promote Compliance with International Conservation and Management Measures by Vessels Fishing in the High Seas shall be encouraged to accept the Agreement and to adopt laws and regulations consistent with the provisions of the Agreement.**	
Relevance:	Not relevant	
	Note: Not applicable if the fishery does not occur in high seas.	
Evaluation Parameters		**Met?**
Process: *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.*		☐
EVIDENCE: The Supporting clause is not relevant because the Pacific Halibut and Sablefish fisheries do not operate on the high seas (beyond the U.S. EEZ).		
Current status/Appropriateness/Effectiveness: *There are laws regulating high seas fishing activity. Describe how they accomplish this.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

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

9.2.2 Fundamental Clause 2. Coastal area management frameworks

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.

9.2.2.1 Supporting Clause 2.1.

2.1.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑

EVIDENCE:

The principal federal and state fishery agencies have processes, committees and groups that allow coastal zone resource management issues to be brought to formal review and engagement. The NPFMC, NOAA Fisheries, Alaska's Departments of Fish and Game, Environmental Conservation, and Natural Resources convene meetings for consulting and creating awareness of issues to do with coastal resource management and their potential impact on fish stocks and socio-economic interests.

Integrated management of multiple coastal areas is accomplished through an institutional framework of federal laws and regional practices. The *Coastal Zone Management Act* (CZMA) was enacted in 1972 to preserve, protect and develop, and, where possible, to restore and enhance the resources of the coastal zone. The Act was designed to encourage and assist states in developing coastal management programs, to coordinate state activities, and to safeguard regional and national interests in the coastal zone. It created a voluntary partnership between NOAA and the states in coastal management programs in which a state or university program takes the lead to manage these special places with assistance from NOAA.

The *National Environmental Policy Act* (NEPA) applies to actions taken in the coastal zone. To implement NEPA's policies, Congress prescribed a procedure, commonly referred to as "the NEPA process" or "the environmental impact assessment process." This process provides public information and opportunity for public involvement at both the state and federal levels in regard to projects and undertakings that may impact a coastal zone.

The National Coastal Zone Management Program works with coastal states and territories to address some of today's most pressing coastal issues, including climate change, ocean planning, and planning for energy facilities and development. The program monitors and evaluates the success of its efforts through national performance measures. A performance measurement system is used to evaluate progress in meeting national goals. Annual performance goals cover five categories: coastal habitat, coastal hazards, coastal community development, public access, and coordination and public involvement. Contextual information is also collected, including information about socio-economic, natural hazard, and other environmental trends along the coast. These indicators provide context for the performance measurement data collected by state programs. However, Alaska withdrew from the voluntary program in July 2011. Accordingly, the CZMA Federal consistency provision, section 307, no longer applies in Alaska. In addition, Alaska is no longer eligible for several but not all CZMA grants.

2.1.	**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.**

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

The needs of coastal communities are explicitly addressed in fishery management through National Standard (NS) 8 of the MSA, which requires that conservation and management measures shall, consistent with conservation requirements (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that are based upon the best scientific information available (50 CFR 600.305 2022). Socioeconomic considerations and social and cultural values of coastal resources are explicit components of the decision-making process for allocation and use of resources within NEPA.

The NEPA process imposes mandatory obligations on lead agencies for complying with the requirements of Act including the preparation of the environmental analysis. Federal agencies, together with state, tribal or local agencies, may act as joint lead agencies. A federal, state, tribal or local agency having special expertise with respect to an environmental issue or jurisdiction by law may be a cooperating agency. A cooperating agency has the responsibility to (i) assist the lead agency by participating in the NEPA process at the earliest possible time, (ii) participate in the scoping process, (iii) develop information and prepare environmental analysis that the agency has special expertise in, and (iv) make staff support available. Of note, a federal agency may refer to the Council on Environmental Quality (CEQ) interagency disagreements concerning proposed federal actions that might cause unsatisfactory environmental effects. CEQ's role, when it accepts a referral, is generally to develop findings and recommendations, consistent with the policy goals of Section 101 of NEPA.

In Alaska, the Department of Natural Resources' Office (DNR) of Project Management and Permitting (OPMP) coordinates the review of large scale projects in the State.- Because of the complexity and potential impact of these projects on multiple stated agencies or divisions, these projects typically benefit from a single primary point of contact. A project coordinator is assigned to each project in order to facilitate interagency coordination and a cooperative working relationship with the project proponent. In addition to large project coordination, OPMP also coordinates the State's input on a variety of federal land use plans, including Alaska National Interest Lands Conservation Act(ANILCA) coordination for planning efforts in conservation system units in Alaska. OPMP also coordinates the State's participation in a variety of federal grant programs.

Evidence Basis: *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.*	☑

EVIDENCE:

Examples of coastal management plans or policy documents, and frameworks for resource/coastal management include:

- NPFMC's Bering Sea Fishery Ecosystem Plan: https://www.npfmc.org/wp-content/uploads/BSFEP-1.2019-1.pdf
- NPFMC's Aleutian Islands Fishery Ecosystem Plan: https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf
- H.R.2750 - 117th U.S. Congress (2021-2022): *Blue Carbon for our Planet Act*. This bill addresses the protection and restoration of coastal blue carbon ecosystems, which are vegetated coastal habitats and include mangroves, tidal marshes, and other tidal or salt water wetland that have the ability to sequester and store carbon. Specifically, the bill establishes the Interagency Working Group on Coastal Blue Carbon to (1) develop and maintain a map of these ecosystems, (2) assess the impediments to the protection and restoration of these ecosystems, and (3) establish national

2.1.	**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.**

protection and restoration priorities regarding these ecosystems; available at: https://www.congress.gov/bill/117th-congress/house-bill/2750

- NPFMC Policy Frameworks for Ecosystem-Based Fishery Management, EFH Consultation Policy, Groundfish Fisheries Management, Habitat Areas of Particular Concern, and Spatial Management; available at: https://www.npfmc.org/how-we-work/management-policies/
- ADFG's Kachemak Bay Critical Habitat Area Management Plan: https://www.adfg.alaska.gov/index.cfm?adfg=kachemakbay.managementplan
- ADFG Climate Change Strategy: https://www.adfg.alaska.gov/static/lands/ecosystems/pdfs/climatechangestrategy.pdf
- Arctic and Chukchi Sea Ecosystem Survey: https://www.fisheries.noaa.gov/alaska/ecosystems/arctic-and-chukchi-sea-ecosystem-survey

The availability and quality of the evidence is sufficient to substantiate that within the jurisdictions of the principal federal and state fisheries management organizations an appropriate policy has been adopted to achieve sustainable and integrated use of living marine resources.

References:	1. https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AMEF_MOU.pdf 2. https://coast.noaa.gov/czm/act/ 3. https://coast.noaa.gov/czm/about/ 4. https://www.federalregister.gov/documents/2011/07/07/2011-16987/alaska-coastal-management-program-withdrawal-from-the-national-coastal-management-program-under-the 5. http://dnr.alaska.gov/commis/opmp/ 6. https://www.epa.gov/nepa/what-national-environmental-policy-act#NEPArequirements

Numerical score:	**Starting score**			**Number of EPs NOT met**					**Overall score**
	10	**–**	**(**	**0**	**x**	**3**	**)**	**=**	**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**

9.2.2.2 Supporting Clause 2.1.1.

2.1.1.	**States shall establish mechanisms for cooperation and coordination in planning, development, conservation, and management of coastal areas.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *There is a mechanism to allow cooperation between neighboring States to improve coastal resource management.*	☑

EVIDENCE:

Inter-agency and inter-governmental mechanisms

Large-scale projects in Alaska are managed by the Office of Project Management and Permitting of the Department of Natural Resource (ADNR). The Office is the lead coordinating agency for interstate agency participation in implementation of the Alaska National Interest Lands Conservation Act (ANILCA). ANILCA specifically directs federal agencies to consult and coordinate with the State of Alaska.

The Alaska Marine Ecosystem Forum (AMEF) which brings together Alaska's Federal and State agencies as well as the NPFMC to address issues of shared responsibilities related to the marine ecosystems off Alaska's coast. The AMEF's Memorandum of Understanding (MOU) promotes the collective aim of Federal and State agencies and the Council to achieve sustainable management and use of Alaska's marine ecosystems in the most effective and efficient manner, consistent with the missions of those agencies. The MOU is reviewed by the Parties on an annual basis to assess continuing need and whether the MOU should be amended, revised or canceled.

Participating agencies must agree to:

- Work in good faith to share pertinent, unclassified, information with other AMEF participants.
- Consider relevant information in order to make well-informed decisions.
- Consider indirect consequences for other components of the ecosystem.
- Facilitate open discussion of ways to resolve potential conflicts between competing uses of the ecosystem area.
- Help inform other interested governmental and non-governmental organizations and provide an opportunity for their contributions to regional marine ecosystem forum meetings and discussions.

The coastal zone is monitored as part of the coastal management process using physical, chemical, biological, economic, and social parameters. Involvement includes federal and state agencies and programs including the U.S. Fish and Wildlife Service, the NMFS Fisheries Science Centre, the NMFS' Habitat Conservation Division, and their Essential Fish Habitat monitoring and protection program, the USCG, and the ADFG. For example, in Alaska, the State has established Critical Habitat Areas (AS 16.20.500) to "protect and preserve habitat areas especially crucial to the perpetuation of fish and wildlife, and to restrict all other uses not compatible with the primary purpose." Permits are required from the Habitat Section for any habitat altering activity (AS 16.20.520-530) or any activity which disturbs fish or wildlife other than lawful hunting, trapping, and fishing.

All major agencies at the federal and state levels participate in the NEPA processes that are intended to manage coastal area resources in a transparent, responsible, and sustainable manner. Section 307(c)(1) of the federal Coastal Zone Management Act requires federal activities that affect any land or water use, or natural resource of a state's coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state coastal management programs. The requirements for the consistency determination are set forth in NOAA regulations at 15 CFR part 930, subpart C.

Current status/Appropriateness/Effectiveness: *There are records of cooperation. Examples may include fishery, fishery enhancement, or other agreements or records from international forums.*	☑

EVIDENCE:

Records of cooperation between the principal federal and state agencies that are active in Alaska (including the IPHC for this assessment) are maintained according to the statutory requirements of the APA or the agency's own organizational practices and procedures. Meeting minutes are web posted in all cases and; in some cases, audio files are also posted.

2.1.1.	**States shall establish mechanisms for cooperation and coordination in planning, development, conservation, and management of coastal areas.**

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the States establish mechanisms for cooperation and coordination in planning, development, conservation, and management of coastal areas. Examples may include reports or data on the international cooperation/information exchange in these events.*	☑

EVIDENCE:
The availability and quality of the evidence is sufficient to substantiate that within the jurisdictions of the state fisheries management organization, there are established mechanisms for cooperation and coordination within the state and between federal agencies for coastal management activities.
Evidence of this is found on Alaska Marine Ecosystem Forum, memorandum of understanding, Alaska Marine policy forum website and the Alaska National Interest Lands Conservation Act (ANILCA) Program
Please see supported evidence on the references.

References:	1. https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AMEF_MOU.pdf 2. https://aoos.org/alaska-issues-2/alaska-marine-policy-forum/ 3. https://www.adfg.alaska.gov/index.cfm?adfg=habitatoversight.anilca

Numerical score:	**Starting score**			**Number of EPs NOT met**					**Overall score**
	10	**–**	**(**	**0**	**x**	**3**	**)**	**=**	**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**

9.2.2.3 Supporting Clause 2.1.2.

2.1.2.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *There are appropriate technical capacities and financial resources.*	☑
EVIDENCE: The technical capacities of the principal federal and state agencies involved in the management of Pacific Halibut and Sablefish are significant, including internationally recognized scientists and economists, seasoned fishery managers and policy makers, professional enforcement officers. Their efforts are complemented by professional staffs of environmental and other not-for-profits including academia. Financial resources appropriate to various management and regulatory requirements are acquired through appropriations and cost-recovery programs such as the North Pacific Observer Program and the IFQ Programs.	
Current status/Appropriateness/Effectiveness: *It can be determined with confidence that there are appropriate technical capacities and financial resources.*	☑
EVIDENCE: US and Alaska participation in the Pacific Halibut and Sablefish commercial fisheries is financed through congressional appropriations (federal agencies) and the legislature (state agencies). No evidence was found by the reassessment team of a lack of resources or technical capacity within the agencies responsible for managing the fisheries. According to CFR § 600.125 (Budgeting, funding, and accounting), Councils may not independently enter into agreements, including grants, contracts, or cooperative agreements, whereby they will receive funds for services rendered. All such agreements must be approved and entered into by NOAA on behalf of the Councils.	
Evidence Basis: *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.*	☑
EVIDENCE: The availability and quality of the evidence is sufficient to substantiate that the fisheries management organizations representing the fisheries sector and fishing communities in the coastal management process have the necessary technical capacities and financial resources. Evidence of this is found on the Cost Recovery Programs, Fee Collection and Fee Payment in Alaska website, Observer Fee Collection and Payment - North Pacific Groundfish and Halibut Fisheries Observer Program website, and the Part 600 Magnuson Stevens Act provisions website Please see supported evidence on the references.	

References:	1. https://www.fisheries.noaa.gov/alaska/commercial-fishing/cost-recovery-programs-fee-collection-and-fee-payment-alaska 2. https://www.fisheries.noaa.gov/alaska/commercial-fishing/observer-fee-collection-and-payment-north-pacific-groundfish-and-halibut 3. https://www.ecfr.gov/current/title-50/part-600

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:	Full Conformance

2.1.2.	**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.**	
(10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)		
Non-conformance Number (if applicable):		**NA**

9.2.2.4 Supporting Clause 2.2.

2.2.	**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 coastal management process.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *Describe how fishery-related information is disseminated and how a process is in place to consult with the fishery sector and fishing communities.*	☑

EVIDENCE:

Federal management organizations participate in coastal area management processes through the federal NEPA process of environmental assessment. These include consultation and decision-making processes and activities relevant to fishery resources and users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users.

To implement NEPA's policies, Congress prescribed a procedure, commonly referred to as "the NEPA process" or "the environmental impact assessment process." The NEPA process provide public information and opportunity for stakeholder involvement at both the state and federal levels. In this way, any application for a permit to undertake an activity or development in the coastal region, requires the agency that is being asked to issue the permit to evaluate the environmental effects of the permit and follow the NEPA process. According to 40 CFR § 1507.3 - NEPA procedures, agencies shall adopt, as necessary, NEPA procedures to improve agency efficiency and ensure that agencies make decisions in accordance with the Act's procedural requirements. Such procedures shall include:

- Designating the major decision points for the agency's principal programs likely to have a significant effect on the human environment and assuring that the NEPA process begins at the earliest reasonable time, consistent with § 1501.2, and aligns with the corresponding decision points.
- Requiring that relevant environmental documents, comments, and responses be part of the record in formal rulemaking or adjudicatory proceedings.
- Requiring that relevant environmental documents, comments, and responses accompany the proposal through existing agency review processes so that decision makers use the statement in making decisions.
- Requiring that the alternatives considered by the decision maker are encompassed by the range of alternatives discussed in the relevant environmental documents and that the decision maker consider the alternatives described in the environmental documents. If another decision document accompanies the relevant environmental documents to the decision maker, agencies are encouraged to make available to the public before the decision is made any part of that document that relates to the comparison of alternatives.
- Requiring the combination of environmental documents with other agency documents. Agencies may designate and rely on one or more procedures or documents under other statutes or Executive orders as satisfying some or all of the requirements in this subchapter and substitute such procedures and documentation to reduce duplication. When an agency substitutes one or more procedures or documents for the requirements in this subchapter, the agency shall identify the respective requirements that are satisfied.

As a result, representatives of the fisheries sector and fishing communities are consulted in the decision-making processes and in other activities related to coastal area management planning and development and kept aware of the need for protection and management of coastal resources. Participation in the NEPA's environmental review and decision-making process by the fishery sector and fishing communities is facilitated by a January 2021 guide issued by the CEQ titled *A Citizen's Guide to NEPA - Having You Voice Heard.* The guide assists sectors and communities in understanding proposals for Federal actions, when to offer advice on alternative ways for the Federal agency to accomplish what it proposes, and how to comment on the agency's analysis of the environmental effects of the proposed action and possible mitigation of potential harmful effects of such actions.

2.2.	**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 coastal management process.**

When preparing an EA, the relevant agency has discretion as to the level of public involvement. The CEQ regulations state that the agency must involve, to the extent practicable, the public, State, Tribal, and local governments, other relevant agencies, and applicants in preparing EAs. If a federal agency is proposing a major Federal action significantly affecting the quality of the human environment, it must prepare an EIS the regulatory requirements are more detailed than the requirements for an EA. The EIS process consists of four main stages:

- Scoping with a public notice of intent to prepare an EIS - people and organizations with an interest in the proposed action are notified and invited to participate.
- Draft EIS and public comment period - the agency publishes its EIS on an agency website and the EPA publishes a Notice of Availability in the *Federal Register* informing people and organizations that the draft is available for comment. Based on the communication plan established by the agency, websites, local papers, or other means of public notice may also be used. The comment period is at least 45 days long. During this time, the agency may conduct webinars, public meetings, or hearings as a way to solicit comments. The agency will also request comments from other Federal, State, Tribal, and local agencies that may have jurisdiction or interest in the matter. The draft EIS will also contain a summary of alternatives, information, and analysis submitted by commenters during the scoping process. The agency will specifically invite comment on this summary.
- Finalize the EIS - the agency may respond to individual comments or groups of comments by making changes to the proposed action or alternatives, developing new alternatives, modifying its analyses, making factual corrections, or explaining why a comment does not require the agency's response.
- Issue the record of decision - the document states what the decision is; identifies the alternatives considered, including the environmentally preferred alternative; and discusses mitigation plans, including any enforcement and monitoring commitments. The ROD also will contain a certification by the decision maker that, in developing the EIS, the agency has considered all of the alternatives, information, analysis, and objections submitted by State, Tribal, and local governments and public commenters.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

When initiating the public and the harvesting/processing sectors regarding coastal area management and planning initiatives, the lead federal and/or state agencies would have already developed a public engagement plan and a communications plan. The approach to consultations might be through established public and industry groups or new constructs. Materials to be distributed, presentations to be given, dealing with the media, and additional outreach initiatives (if necessary) would typically be components of the agency/ies planning process.

The reassessment team determined that it was unnecessary to request records of consultation and/or communications plans from a federal or state coastal area management agency. This information is typically sourced from agency websites and/or committee meeting minutes.

Evidence Basis: *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.*	☑

2.2.	**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 coastal management process.**

EVIDENCE:
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 are also kept aware of the need for the protection and management of coastal resources and are participants in the management process.
Evidence of this is found on the citizen guide to NEPA from 2021, and the 40 CFR § 1507.3 - Agency NEPA procedures.

Please see supported evidence on the references

References:	1. https://ceq.doe.gov/docs/get-involved/citizens-guide-to-nepa-2021.pdf 2. https://www.law.cornell.edu/cfr/text/40/1507.3							
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**

9.2.2.5 Supporting Clause 2.3.

2.3.	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.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑

EVIDENCE:

As reported, the federal and state coastal area management processes provide several avenues for fishing industry and stakeholder engagement and participation in decision making. These processes by design are intended to expose project plans, nurture responses, and minimize potential conflicts amongst users of the resource in the impacted coastal area.

The principle federal and state management organizations and their staff are suitably structured to carry out all facets of coastal area management planning. Any new policy deliberations, regulatory amendments and additional management measures are discussed at NPFMC and ABoF/ADFG meetings. Stakeholders are actively encouraged to participate and contribute to existing agenda items or offer up new items for public discussion and management consideration. The state's *Open Meetings Act* applies to regular meetings, special meetings, emergency meetings and committee meetings. The Act requires that:

- all deliberations and action taken by a public entity must be done in public view, with limited exceptions,
- the public must be provided prior knowledge of all steps occurring in the decision-making process, with limited exceptions; and that,
- individual actions of an official are made known.

Potential conflicts between fishermen and other coastal users at the federal level are usually discussed and resolved through the NEPA Process. The NEPA review process purposely considers all resources and users of those resources in order to resolve potential conflicts among users before project approvals are given. The NPFMC and ABoF/ADFG processes serve to provide a forum for fishery conflict resolution. Both agencies encourage testimony from fishers, the environmental community, and the public at-large at meetings and hearings. Conflict resolution mechanisms include both administrative (through governmental agencies) and legal (through courts of law) procedures.

Typically, laws, regulations, and public outreach activities are in place to settle conflicts that may arise within the fisheries sector, or between fisheries resource users and other coastal users. Apart from any coastal area management decisions rendered in 2021 or 2022, there was no evidence to indicate that the fisheries management decisions during these years led to conflicts between users or others. Moreover, the management system was not subject to continual unresolved or repeated disputes or political instability.

Current Status/Appropriateness/Effectiveness: *Describe these practices and their effectiveness within the fishery sector, and between fishers and other coastal users.*	☑

EVIDENCE:

Meetings of the main federal and state management committees and their subordinate bodies are open to the public. Time is allotted for attendees to raise concerns or seek explanations. Meeting schedules, locations, agendas, discussion documents are typically posted well in advance thus facilitating transparency of the proceedings and incentivizing public participation. Written public comments and summaries are provided to PFMC members in their briefing books and opportunity for oral testimony is provided at meetings.

Conflicts between fishers and other coastal users can occur for any number of reasons. There is no evidence to suggest that systemic non-compliance is occurring in either fishery. When conflicts arise, federal and state enforcement agents are authorized to take action. The court system is also available and is generally trusted as a fair arbiter of disputes.

2.3.	**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.**

Evidence Basis: *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.*	☑

EVIDENCE:
The availability, quality and adequacy of the evidence is sufficient to substantiate that fisheries practices that avoid conflict among fishers and other users in the coastal areas are adopted and fishing is regulated to avoid risk of conflict.
Evidence of this is found on NEPA policy act review process, meetings from NPFMC, minutes from meetings from AKBOF and Please see supported evidence on the references.

References:	1. https://www.epa.gov/nepa/national-environmental-policy-act-review-process 2. https://meetings.npfmc.org/ 3. https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo 4. https://gov.alaska.gov/wp-content/uploads/sites/2/Open-Meetings-Act.pdf

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**

9.2.2.6 Supporting Clause 2.4.

2.4.	**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.**

Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *There is a process that allows for fishery-related information to be disseminated.*	☑

EVIDENCE:

As previously reported, members of the fisheries sector (fishers, processors, and wholesalers) are accorded opportunities to participate in the engagement and decision-making activities of the main federal and state management organizations. The access serves to inform the sector of proposed changes to federal and state laws and regulations before they are adopted. The access also serves to inform regulators of any potential sectoral concerns involving possible resource use conflicts including in relation to coastal area management planning and development. The NEPA process provides a similar point of entry for information to be disseminated to the sector and public at large.

Similarly, NPFMC, NOAA Fisheries and Alaska state agencies have websites that provide extensive information on management and conservation measures for interested parties. This information includes news releases, species plans, newsletters, meeting agendas, meeting minutes and supporting documentation.

Current status/Appropriateness/Effectiveness: *There is a record of the disseminated information, and is it disseminated effectively, and the basis and purposes of such regulation explained to users.*	☑

EVIDENCE:

The MSA requires that regional Councils hold public meetings within their respective regions to, *inter alia,* discuss the development and amendment of FMPs. Councils are composed of federal, state, and territorial fishery management officials, participants in commercial and recreational fisheries, and other individuals with experience, scientific expertise, or training that give them knowledge about fishery conservation and management or commercial or recreational harvest. A Council's primary responsibility is to develop and recommend fishery management measures for any fishery under their jurisdiction that requires conservation and management.

NPFMC committee and subordinate committees' meetings are open to the public and often webcast thus providing an opportunity for discussion of new regulations and management measures. Extensive information is disseminated at meetings, on the Council and NMFS websites, local offices of federal and state enforcement and through state fish and wildlife agency offices. In addition to local radio, printed news releases and Emergency Orders (available at local harbor master's offices, marine supply outlets, etc) are also important sources of public information. NOAA-OLE, USCG and ADPS-AWT enforcement place an emphasis on educating and informing stakeholders of new regulatory changes and other important fishery related matters.

Council's fishery management decisions are supported by a record that provides for the basis of a decision under the existing legal requirements and by analyses that comply with applicable law. The respective decisions of the Council and NMFS are sufficiently interrelated that they are often supported by the same record.

Meetings of the ABoF's statewide advisory committees are open to the public and provide a local forum for the public, advisory committee members, ADFG and other agency staff to discuss fish and wildlife issues. Meetings focus on developing and evaluating regulatory proposals and consulting with individuals, organizations, and agencies on fish, wildlife, and habitat issues. Advisory committee membership, uniform rules and responsibilities are defined in regulation in 5 AAC Chapter 96, and their functions are supported by ADFG Boards Support Section through local regional coordinators.

2.4.	**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.**

Advisory committees are considered a governmental body under the *Open Meetings Act* (AS 44.62.310 - AS 44.62.319) wherein they must meet at least twice a year to remain active under 5 AAC 96.450. As for meeting records, preliminary recommendations of each committee meeting are to be recorded in writing and forwarded to the boards support section not later than 30 days after the meeting. Before an advisory committee chair or a designee is allowed to represent the advisory committee before the joint board, the appropriate board may require that the advisory committee submit to the respective board a set of the committee's written recommendations relevant to the topic of the board meeting. All correspondence, manuals, meetings minutes, membership listings, newsletters, regulations, requests for new committees, structure and reorganization data, public meeting notices and membership nominations must be forwarded to the boards support section not later than 30 days after the production of the action, so that such records may be kept as a permanent state record and transferred to the Alaska State Archives in accordance with the records retention schedule adopted under AS 40.21.030.

There is a clear sense that federal and state agencies prioritize transparency and effectiveness of the decision-making process by clearly explaining their regulatory process, promoting the public's accessibility to the process, fostering effective and constructive public input, and providing mechanisms for people to track the progress of different actions.

Evidence Basis: *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.*	☑

EVIDENCE:
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 and explained to users.
Evidence of this is found on the Chapter 96 - Local Fish and Game Advisory Committees and Adoption of Fish and Game Regulations, Board of fisheries advisory committee process website
Please see supported evidence on the references.

References:	1. https://www.law.cornell.edu/regulations/alaska/title-5/part-6/chapter-96 2. https://www.adfg.alaska.gov/static/regulations/regprocess/pdfs/acmanforms/ac_process_brochure_2014.pdf 3. https://gov.alaska.gov/wp-content/uploads/sites/2/Open-Meetings-Act.pdf

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**

9.2.2.7 Supporting Clause 2.5.

2.5.	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.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *There is a system that allows for socio-economic value assessments and cultural value assessments to be carried out.*	☑

EVIDENCE:
NOAA's Alaska Fisheries Science Centre runs the Economic and Social Sciences Research Program. Staff produce Groundfish Economic Status Reports which summarize available economic data about the federal groundfish fisheries in the Gulf of Alaska and the Bering Sea/Aleutian Islands. Published annually as an appendix to the Stock Assessment and Fishery Evaluation (SAFE) reports, the Economic Status Report presents summary statistics on catch, discards, prohibited species catch, ex-vessel and first-wholesale production and value, participation by small entities, and effort in these fisheries. The most recent NOAA report is for the state's 2020 groundfish fisheries.

Current status/Appropriateness/Effectiveness: • *There are socio-economic value assessments and cultural value assessments, both of which are effectively assisting decision making on resource allocation and use.*	☑

EVIDENCE:
NOAA's Alaska Fisheries Science Centre 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. Regarding socio-economic data collection, the Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska. NOAA staff also conduct research to evaluate the benefits and costs of alternative management actions for commercial fisheries, prioritize management needs, and design policies that sustainably maximize societal benefits from ocean and coastal resources. The agency's main areas of interest include:

- Cost and earning reports
- Economic performance of fisheries
- Regional economic impacts
- Spatial choice behavior
- Market dynamics and consumer preferences
- Capacity and technical efficiency measurement
- Allocation of resources among user groups

The Research and Planning Section of Alaska's Commercial Fisheries Entry Commission of the ADF&G produces and publicizes several fishery-related reports. Much of the data that are used in the reports are shared with the ADFG, NMFS and NPFMC through the Alaska Fisheries Information Network. Core reports include:

- Economic reporting
- Buyback consultation and implementing
- Permit value reports
- Gross earnings
- Regulatory reviews and comments
- Permit holder surveys
- Ex-vessel price estimates
- Fisheries monitoring

Evidence of the process implemented and current status with regards to economic, social and cultural value of Alaska's groundfish resources is contained in the report titled: Stock Assessment and Fishery Evaluation (SAFE) Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Islands Area: Economic Status of the Groundfish Fisheries off Alaska, 2020.

Evidence Basis:	☑

2.5.	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.

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.

EVIDENCE:
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.
Evidence of this is found on the AKFSC website, and the economic status of groundfish fisheries reports from SAFE reports please see supported evidence on the references.

References:	1. https://www.fisheries.noaa.gov/about/alaska-fisheries-science-center 2. https://media.fisheries.noaa.gov/2022-04/Groundfish%20SAFE%202020.pdf 3. Refer to Section 6.6 of this report for additional information.

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**

9.2.2.8 Supporting Clause 2.6.

2.6.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *There is a system that allows research and monitoring of the coastal environment, and multidisciplinary research in support of coastal area management is promoted.*		☑

EVIDENCE:

Monitoring of the coastal environment in Alaska is performed by federal and state agencies. The NMFS and NPFMC as federal agencies participate in coastal area management-related institutional frameworks through federal NEPA processes. Other federal and State agencies that cooperate at the sub-regional level to improve coastal area management include:

- Alaska Department of Environmental Conservation (DEC)
- Alaska Department of Fish and Game (ADFG)
- Alaska Department of Natural Resources (DNR)
- DNR Office of Project Management and Permitting (OPMP)
- U.S. Fish and Wildlife Service (USFWS)
- Bureau of Ocean Energy Management (BOEM)

The ADFG's Habitat Division conducts research on coastal and marine environments throughout Alaska to document and mitigate human-related impacts, changes in habitat and species abundance. The agency also collects physical and chemical data, including temperature, depth, salinity, and conductivity during their St. Matthew's pot survey using data loggers placed on the survey pots.

Other entities involved in collaborative research in the North Pacific region include the Alaska Fisheries Science Center (AFSC), North Pacific Research Board (NPRB), NMFS Pacific Marine Environmental Lab (PMEL) and institutes of higher learning such as the University of Alaska Fairbanks' (UAF) Institute of Marine Science (IMS).

NOAA Fisheries' Alaska Region's Ecosystem Research Program and its' Habitat and Ecological Research Program are instrumental in researching and monitoring the region's coastal environment, and in promoting coastal area management.

A. Ecosystem Research Program

The program's objective is to improve and reduce uncertainty in stock assessment models of commercially important fish species by collecting, analyzing and incorporating observations of fish and oceanography into these models. Fish and oceanographic observations are used to connect climate change and variability in large marine ecosystems to early marine survival of commercially important fish species in the Gulf of Alaska, Bering Sea, and Arctic.

Staff monitor changes in coastal and marine ecosystems, conduct research on climate-ecosystem linkages, and incorporate climate information into physical-biological models. This work helps to achieve NOAA Fisheries strategic goals of developing predictive models that anticipate the consequences of climate change on ecosystems.

The program's annual marine surveys leverage Alaska Fisheries Science Center resources through partnerships in regional research programs such as North Pacific Research Board, the North Pacific Anadromous Fish Commission's Bering Aleutian Salmon International Survey (BASIS), the Bering Sea Fisherman's Association, the Alaska Sustainable Salmon Fund, and the Arctic Yukon Kuskokwim Sustainable Salmon Fund.

2.6.	**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.**

B. Habitat and Ecological Research Program

The program focuses on integrated studies that combine scientific capabilities and create comprehensive research on habitat and ecological processes. The program's main research areas includes (i) loss of sea ice, and (ii) essential fish habitat. The latter's major research needs includes: (i) to identify habitats that contribute most to the survival, growth, and productivity of managed fish and shellfish species; and (ii) to determine how to best manage and protect these habitats from human disturbance and environmental change.

The NPFMC and NOAA Fisheries (NMFS) are required to review the Essential Fish Habitat (EFH) components within each fishery management plan (FMP) every five years. As for Federal regulations implementing EFH provisions, the MSA requires that a review and revision of EFH components of the FMPs be completed every five years (50 C.F.R. 600.815(a)(10)). The last comprehensive review of EFH was initiated in 2015 and implemented in 2018. The regulations also state that EFH information should be reported annually in the Stock Assessment Fishery Evaluation (SAFE) Reports.

The 2022 EFH 5-year Review will evaluate EFH components in the six Council FMPs, with respect to new information. The FMPs include: (i) Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI Groundfish), and (ii) Groundfish of the Gulf of Alaska (GOA Groundfish).

In view of the relatively major update that was completed in 2017 and implemented in 2018, the approach to the 2022 EFH Review is to broadly evaluate all 10 EFH components in the Council's FMPs and solicit input from the Council on which of them warrant updates or a more detailed review. Once the summary report is prepared, the Council will be able to determine what action, if any, is warranted based on the report. If the Council decides to initiate FMP amendments to update EFH components in the target FMPs or consider additional EFH mitigation measures, the amendments and associated analysis will proceed through the normal Council - NMFS process. If the Council decides to initiate FMP amendments to update EFH components in the target FMPs or consider additional EFH mitigation measures, the amendments and associated analysis will proceed through the normal Council - NMFS process.

NMFS will develop written recommendations to assist the Council in the identification of EFH, adverse impacts to EFH, and actions that should be considered to ensure the conservation and enhancement of EFH for the target FMPs. If the 2022 Review indicates that substantial new information is available, the summary report will recommend potential revisions for each relevant FMP. The Council will then consider this information, and initiate action (proposed FMP amendments) if it is warranted or conclude that no further action is needed.

The Council's timetable to complete the 2022 EFH Review which includes contributions from the Ecosystem Committee and the SSC included:

- April 2022 - Summary Report for Council review; Council may consider setting HAPC priorities and initiating a call for HAPC proposals; Council decision as to whether to implement EFH changes and initiate analysis of FMP amendments.
- April - September 2022 - If the Council decides to amend the FMPs, staff prepare amendments and analysis for EFH changes based on Council recommendations.
- October 2022 - Initial review draft of FMP amendments for EFH changes, Final Summary Report; Council decision on whether to formulate Habitat Areas of Particular Concern (HAPC) proposals into an amendment analysis.
- December 2022 - Council final action on FMP amendments for EFH changes (if any).

Current status/Appropriateness/Effectiveness: *Systems of monitoring and research have taken into account physical, chemical, biological, economic, social, legal, and institutional capabilities to support coastal area management.*	☑

2.6.	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.

EVIDENCE:

In January 2022, NOAA Fisheries - NMFS released the Alaska Fisheries Science Centre's 5-Year Strategic Plan 2023 - 2027. The Plan notes that the AFSC's activities are mandated or guided by laws, policies, executive orders, memoranda, and treaties including but not limited to: (i) the MSA (10 National Standards), (ii) the Endangered Species Act, (iii) the Marine Mammal Protection Act, (iv) the National Environmental Policy Act, (v) the Regulatory Flexibility Act, (vi) the Ecosystem-Based Fisheries Management Policy, (vii) the National Habitat Policy, and (viii) NOAA's Arctic Vision, Strategy and Action Plan.

Science Goal 2 states: *Investigate, model, and predict ecosystem and climate impacts on living marine resources.* Supporting objectives include: (i) Investigate ecosystem-level changes (habitat, food webs, trophic dynamics, distributional shifts, etc.) with field and modeling studies, (ii) Hindcast, forecast, and project direct and indirect effects of climate change on fish, crab, and marine mammals and the associated communities which rely on these resources, and (iii) Identify and implement Arctic research priorities.

NOAA Fisheries Science Centers, Regional Offices, their partner agencies, and organizations are currently developing updated Climate Science Regional Action Plans (RAPs) that were first introduced in 2016. The plans identify actions that each region intends to take over three years (2022 - 2024) to address regional climate science needs and fulfill the objectives of the NOAA Fisheries Climate Science Strategy (NCSS). A public comment period was open from April 22 - July 29, 2022. The climate science regional action plan for Alaska will include the Bering Sea, Gulf of Alaska, Beaufort and Chukchi Seas. Final documents are anticipated to be available December 2022.

An undated draft Gulf of Alaska Regional Action Plan to Implement the NOAA Fisheries Climate Science Strategy in 2022-2024 was web posted for public comment and review. The report notes that partnerships are critically important for long-term monitoring in the Gulf of Alaska. AFSC resources are heavily leveraged and provide a catalyst for partnerships with other federal and state agencies, universities, non-profit and private organizations. Groups that are specifically mentioned in the report include: (i) Pacific Marine Environmental Lab (PMEL), (ii) Recruitment Processes Alliance, (iii) Exxon Valdez Oil Spill Trustee Council/ Gulf Watch Alaska, (iv) North Pacific Research Board, (v) Alaska Department of Fish and Game, (vi) Fisheries and Oceans Canada, and (vii) Cooperative Institute for Climate, Ocean and Ecosystem Studies.

Evidence Basis: *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.*	☑

EVIDENCE:

The availability and quality of the evidence is sufficient to substantiate that there is cooperation to support and improve coastal area management and measures are taken to establish or promote systems for research and monitoring and multidisciplinary research of the coastal areas.

Evidence of this is found on the Alaska Ecosystem Monitoring and Assessment program, Habitat and Ecological Processes Research Program, essential fish habitat (EFH) reviews, NOAA AKFSC Strategic Science Plan, NOAA Fisheries Climate Science Strategy plan, Gulf of Alaska Regional Action Plan to Implement the NOAA Fisheries Climate Science Strategy in 2022-2024

Please see supported evidence on the references.

References:	1. https://www.fisheries.noaa.gov/alaska/ecosystems/alaska-ecosystem-monitoring-and-assessment 2. https://www.fisheries.noaa.gov/alaska/ecosystems/habitat-and-ecological-processes-research-alaska 3. https://www.fisheries.noaa.gov/alaska/habitat-conservation/alaska-essential-fish-habitat-reviews 4. https://www.npfmc.org/wp-content/PDFdocuments/membership/EcosystemCommittee/Meetings2019/EFH_5_Yr_Review_Approach.pdf 5. https://media.fisheries.noaa.gov/2022-02/AFSC-SSP_31JAN22_508_0.pdf

2.6.	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.
	6. https://www.fisheries.noaa.gov/national/climate/noaa-fisheries-climate-science-strategy 7. https://media.fisheries.noaa.gov/2022-04/GOA-RAP-Draft-for-Public-Comment.pdf

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**

9.2.2.9 Supporting Clause 2.7.

2.7.	In the case of a States' 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.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑

EVIDENCE:

Oil spills

The Pacific States - British Columbia Oil Spill Task Force has been in place since 1989, formed in the wake of a 1988 oil spill off the Washington coast to which agencies were unequipped and unprepared to respond. The task force brought together Washington, Oregon, California, Alaska, British Columbia and Hawaii to fulfill the mandates of the Oil Pollution Act of 1990 in their jurisdictions. The Task Force collects and shares data on oil spills, coordinates oil spill prevention projects, and promotes regulatory safeguards. Its mission is to improve prevention, preparation, and response to oil spills on a state and provincial level.

The Task Force's Strategic Plan 2019-2025 maps out the Vision, Mission and Goals of the organization for upcoming work in oil spill prevention, preparedness, response, recovery and communications, and follows the intent of the Task Force's Memoranda of Cooperation of 1989 and 2001. The plan focusses on 5 core goals: (i) Adapt to changes in oil movement and risks, (ii) Advance readiness and capacity to respond to oil spills, (iii) Deepen partnerships to make better decisions and expand knowledge, (iv) Build and enhance visibility and relevancy of the Task Force, (v) Nurture organizational health.

Invasive Species

Alaska's fisheries and marine mammals, and the habitats that support them, are at risk of degradation from the spread of invasive species. Invasive species can: (i) Alter ecosystems, (ii) Displace, compete and prey on native species, (iii) Foul infrastructure, and (iv) Sicken humans by causing diseases.

Invasive species are often discharged from ship's ballast water and organisms attached to the hull of ships. Increases in shipping and vessel-based tourism—along with climate change due to a warming Arctic—mean that infestations are becoming more probable. In Alaska, NOAA Fisheries works with other federal agencies, the State of Alaska, academic institutions, and local communities to educate, monitor, and detect invasive species. As necessary, the agency works to control or eradicate invasive species that may pose a threat to marine life under NOAA Fisheries jurisdiction.

Another organization – the multi-national Arctic Council's *Arctic Invasive Alien Species (ARIAS) Strategy and Action Plan* sets forth the priority actions that the Council and its partners are encouraged to take to protect the Arctic region from a significant threat: the adverse impacts of invasive alien species. These priority actions span terrestrial, aquatic, and marine ecosystems. The actions take environmental, cultural, and economic perspectives into consideration, including drivers, impacts, and response measures.

The Council's *Cooperative Strategy for the Conservation of Biological Diversity in the Arctic Region, Program for the Conservation of Arctic Flora and Fauna*, is designed to provide the Conservation of Arctic Flora and Fauna (CAFF) group with directions to enhance co-operation among Arctic countries and relevant agencies, communities and organizations, in order to secure the natural productive capacity of Arctic ecosystems and secure biological diversity at all levels. This strategy has three goals include: (i) Support the conservation of Arctic biological diversity, including the diversity of ecosystems, species, populations and their habitats and genetic resources, (ii) Promote the participation of local and Indigenous people in the development and implementation of policies and programs relating to the conservation of Arctic biological diversity and the sustainable use of biological resources, and (iii) Develop and improve public education and awareness programs that support the conservation of Arctic biological diversity and the sustainable use of biological resources.

2.7.	**In the case of a States' 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.**

Current status/Appropriateness/Effectiveness: *There are current agreements for or past records of such occurrences. Examples may include oil spills, and aquaculture farm escapes among others.*	☑
EVIDENCE: Refer to the previous section for evidence of inter-agency collaboration and arrangements by parties in respect of two major program activities - oil spills and invasive species.	
Evidence Basis: *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.*	☑
EVIDENCE: The evidence is sufficient to substantiate that in the North Pacific Region (Alaska, Canada, the Arctic) should activities having an adverse environmental impact on a state arise, there are arrangements or agreements in place that are designed to foster communication and provide timely information or prior notification. Evidence of this is found in the oilspill task force website, oilspill task force strategic plan, Cooperative, Strategy Conservation Biodiversity Artc region CAAF program Please see supported evidence on the references.	

References:	1. https://oilspilltaskforce.org/ 2. https://oilspilltaskforce.org/documents/strategic-plan/ 3. file:///C:/Users/ocean/Downloads/ARIAS-27April2017_web.pdf 4. file:///C:/Users/ocean/Downloads/Cooperative_Strategy_Conservation_BioDiv_Arctic_Region_CAFF_Program_1997.pdf

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**

9.2.3 Fundamental Clause 3. Management objectives and plan

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

9.2.3.1 Supporting Clause 3.1.

3.1.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

The commercial Pacific halibut and sablefish fisheries in the GOA and the BSAI management areas are managed under the IFQ Program that was implemented in 1995 (58 FR 59375, November 9, 1993). The NPFMC and NOAA Fisheries developed the IFQ Program to resolve the conservation and management problems commonly associated with open access fisheries. There are a small number of commercial sablefish fisheries in state waters that are managed by the ADFG/BoF.

Alaska BSAI and GOA Groundfish Management Objectives

The Council's groundfish management policy applies fisheries management practices that are based on sound scientific research and analysis, proactively rather than reactively, to ensure the sustainability of fishery resources and associated ecosystems. The Council considers and adopts, as appropriate, measures that accelerate the 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 are based on the best scientific information available.

To meet the goals of the overall management approach, the Council and NMFS use the Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement (PSEIS) as a planning document. To help focus consideration of potential management measures, the Council and NMFS use the following objectives as guideposts, to be re-evaluated, as amendments to the FMP are considered over the life of the PSEIS.

Prevent Overfishing

- Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield.
- Continue to use the 2 million mt optimum yield cap for the BSAI groundfish fisheries.
- Provide for adaptive management by continuing to specify optimum yield as a range.
- Provide for periodic reviews of the adequacy of F_{40} and adopt improvements, as appropriate.
- Continue to improve the management of species through species categories.

Promote Sustainable Fisheries and Communities

- 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.
- Promote management measures that, while meeting conservation objectives, are also designed to avoid significant disruption of existing social and economic structures.
- 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.
- Promote increased safety at sea.

3.1.	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.

Preserve Food Web

- Develop indices of ecosystem health as targets for management.
- Improve the procedure to adjust acceptable biological catch levels as necessary to account for uncertainty and ecosystem factors.
- Continue to protect the integrity of the food web through limits on harvest of forage species.
- Incorporate ecosystem-based considerations into fishery management decisions, as appropriate.

Manage Incidental Catch and Reduce Bycatch and Waste

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

Avoid Impacts to Seabirds and Marine Mammals

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

Reduce and Avoid Impacts to Habitat

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

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

3.1.	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.

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

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

Improve Data Quality, Monitoring and Enforcement

- Increase the utility of groundfish fishery observer data for the conservation and management of living marine resources.
- Develop funding mechanisms that achieve equitable costs to the industry for implementation of the North Pacific Groundfish Observer Program.
- Improve community and regional economic impact costs and benefits through increased data reporting requirements.
- Increase the quality of monitoring and enforcement data through improved technology.
- 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.
- Cooperate with research institutions such as the North Pacific Research Board in identifying research needs to address pressing fishery issues.
- Promote enhanced enforceability.
- 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.

Commercial Sablefish Fisheries in State-managed waters

Fisheries for sablefish in Alaska are both federally and state managed. State managed fisheries for sablefish occur in Southeast Alaska (both NSEI and SSEI) and Prince William Sound (inside District) each having separate seasons and GHLs. The Cook Inlet Area fishery is open access with a separate GHL that is set using a historic baseline harvest level adjusted annually by the relative change to the ABC in the federal CGOA. For the Clarence and Chatham Strait sablefish fisheries, an annual harvest objective is set with regard to survey and fishery catch per unit effort and biological characteristics of the population.

The National Marine Fisheries Service (NMFS) and ADFG conduct assessment surveys on sablefish in Alaskan waters. The NMFS conducts an annual longline survey and a triennial trawl survey in the Gulf of Alaska, and ADFG performs annual longline surveys in Chatham and Clarence Strait. These surveys provide estimates of catch per unit effort, relative abundance, and biological data. In addition, tagging studies exist to study sablefish movement for federal, state, and Canadian waters. The ADFG conducts an annual tagging survey in Chatham Strait as part of a mark-recapture study to estimate population abundance.

Sablefish fishery objectives are highlighted in the annual updates to the respective SSEI and NNEI Subdistrict FMPs by staff of the ADFG's Commercial Fisheries Division. The objectives are expressed as management measures and include: (i) annual harvest objectives (AHOs), (ii) mandatory fisher registration, (iii) mandatory logbook completion and submission with e-tickets, (iv) voluntary tagging, (v) bycatch allowances for other species, and (vi) directed catch retention limits.

3.1.	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.

IPHC Primary Objectives for MSE

The Commission's interim Harvest Strategy Policy is a work-in-progress and is informed by the Commission's Management Strategy Evaluation. The MSAB has previously defined four potential goals for evaluating management procedures, and the Commission has identified two of these as primary goals, each one with one or more objectives.

- Biological Sustainability (also referred to as conservation goal)
  - Keep biomass above a limit to avoid critical stock sizes
- Optimise directed fishing opportunities (also referred to as fishery goal)
  - Maintain spawning biomass around a level (i.e., a target biomass reference point) that optimises fishing activities
  - Limit variability in mortality limits
  - Provide directed fishing yield

The two remaining goals have undefined objectives. They relate to discard mortality in directed fisheries and non-directed fisheries and have not yet been specifically considered in the MSE but are identified by the MSAB as important to consider in the future. They are:

- Minimize discard mortality in directed fisheries
- Minimize discards and discard mortality in non-directed fisheries (bycatch)

The MSAB has defined goals for the IPHC's Regulatory Areas and Bioregions. They include:

- Biological sustainability
- Optimise Directed Fishing Opportunities
  - Maintain the spawning biomass around a level that optimises fishing activities
  - Limit variability in mortality limits
  - Provide directed fishing yield

Other possible goals that are under discussion include:

- Minimize directed fishery discard mortality
- Maintain the directed fishery discard mortality at less than 10% of the annual mortality limit

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

In addition to the aforementioned evidence, Council managed fisheries are required by statutes to considering reasonable, adaptive management measures, as described in the *Magnuson-Stevens Act* and in conformance with the National Standards, the *Endangered Species Act* (ESA), the *National Environmental Policy Act*, the *Marine Mammal Protection Act*, and other applicable laws. The management approach also takes into account the National Academy of Science's recommendations on Sustainable Fisheries Policy.

Evidence Basis: *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.*	☑

EVIDENCE:

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 which is subscribed to by all interested parties.

Evidence of this is found on the BSAI and GOA FMPs, ADFG sablefish management website, Northern Southeast Inside Subdistrict Sablefish Management Plan and Stock Assessment for 2021 report, 2021 Southern Southeast Inside Subdistrict Sablefish Fishery Management Plan and the IPHC's document on Primary MSE goals, objectives, and performance metrics

3.1.	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.

Please see supported evidence on the references.

References:	1. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf 2. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf 3. https://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management 4. https://www.adfg.alaska.gov/FedAidPDFs/RIR.1J.2021.13.pdf 5. https://www.adfg.alaska.gov/FedAidPDFs/RIR.1J.2021.12.pdf 6. https://www.iphc.int/uploads/pdf/msab/msab017/iphc-2022-msab017-08.pdf

	Starting score			Number of EPs NOT met					Overall score
Numerical score:	10	–	(	0	x	3	)	=	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**

9.2.3.2 Supporting Clause 3.1.1.

3.1.1.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑

EVIDENCE:

To meet the goals of the overall groundfish management approach, the Council and NMFS use the Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement (PSEIS) as a planning document. To help focus consideration of potential management measures for the protection of ETP species both in the directed and bycatch fisheries, the Council and NMFS use the following objectives as guideposts, to be re-evaluated, as amendments to the FMP are considered over the life of the PSEIS.

Manage Incidental Catch and Reduce Bycatch and Waste

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

Avoid Impacts to Seabirds and Marine Mammals

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

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

3.1.1.	**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.**

Two federal agencies, the NMFS and the U.S. Fish and Wildlife Service (USFWS), are responsible for maintaining lists of species that meet the definition of threatened or endangered under the ESA. NMFS is responsible for maintaining the list for most marine species and managing those species once they are listed. The USFWS is responsible for maintaining the list for terrestrial and freshwater species, as well as three marine mammal species (polar bear, Pacific walrus, and sea otter), and for managing those species once they are listed. NMFS and USFWS must determine if any species is endangered because of any of the following factors:

- The present or threatened destruction, modification, or curtailment of its habitat of range
- Overutilization for commercial, recreational, scientific, or educational purposes
- Disease or predation
- The inadequacy of existing regulatory mechanisms; or Other natural or manmade factors affecting its continued existence.

In compliance with the ESA, the NMFS and the USFWS must designate critical habitat for each species under their jurisdiction that are listed under the ESA. Critical habitat is defined as "specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservations, and those features may require special management considerations for protection" and "specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation."

The ADFG is responsible for determining and maintaining a list of endangered species in Alaska under AS 16.20.190. A species or subspecies of fish or wildlife is considered endangered when the Commissioner of ADFG determines that its numbers have decreased to such an extent as to indicate that its continued existence is threatened. The State Endangered Species List currently includes two birds (Short-tailed Albatross and Eskimo Curlew) and three marine mammals (blue whale, humpback whale, and right whale). The five State-listed species are also listed as endangered under the federal ESA. After making a determination, the commissioner of fish and game shall, in accordance with AS 44.62 (*Administrative Procedure Act*), publish a list of the species or subspecies of fish and wildlife that are endangered. The commissioner shall, at least once every two years thereafter, conduct a thorough review of the list to determine what changes have occurred concerning the species or subspecies listed.

By law (AS 16.20.185), the Commissioners of the ADFG and Natural Resources must take measures to preserve the natural habitat of fish and wildlife species that are recognized as threatened with extinction. The state has designated a significant number of game refuges and established numerous critical habitat areas throughout its jurisdiction for enhanced fish and wildlife protection (AS. Ch.20).

Evidence Basis: *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.*	☑

EVIDENCE:
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.
Evidence of this is found on Alaska Statute Title 16. Fish and Game Chapter 20. Conservation and Protection of Alaska Fish and Game Section 190. Determining Endangered Species. Alaska Statute Title 16. Fish and Game Chapter 20. Conservation and Protection of Alaska Fish and Game previous: Chapter 15. Fisheries Experimental Laboratory next: Section 10. Legislative Recognition; Prohibition Against Ceding State Authority. Chapter 20. Conservation and Protection of Alaska Fish and Game and the Alaska Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS)
Please see supported evidence on the references.

References:	1. http://www.touchngo.com/lglcntr/akstats/statutes/title16/chapter20/section190.htm 2. http://www.touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter20.htm 3. https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis

3.1.1.	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.							
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**

9.2.3.3 Supporting Clause 3.1.2.

3.1.2.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑

EVIDENCE:

The NPFMC's Groundfish FMPs for the BSAI and GOA management areas share a common fishery management goal - 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.

Both FMPs include a variety of restrictions and measures to manage and protect directed and bycatch species, their dependent habitat, and listed ETP species. For example, there are (i) permit and participation restrictions for species and gear endorsements, and specific vessels and gear types, (ii) time and area restrictions for fishing seasons and conservation areas, (iii) bottom and mobile bottom contact gear restrictions, and (iv) directed, bycatch and prohibited species catch limits. Habitat types are also described and EFHs is defined including by species' information level.

To incorporate the regulatory guidelines for review and revision of essential fish habitat (EFH) FMP components, the NPFMC is required to conduct a complete review of all the EFH components of each FMP once every 5 years and amend those EFH components as appropriate to include new information. Additionally, the Council may solicit proposals for HAPC and/or conservation and enhancement measures to minimize the potential adverse effects from fishing. Those proposals that the Council endorses would be implemented through FMP amendments. HAPC proposals may be solicited every 5 years, coinciding with the EFH 5-year review, or may be initiated at any time by the Council. Information emanating from the annual review process is provided to the BSAI and GOA Groundfish Plan Teams for their review during the annual SAFE report process.

According to NOAA's Ecosystem Status Report for 2021 for the Eastern Bering Sea, seafloor habitat impacted by trawls (pelagic and non-pelagic trawl, longline, and pot) as of December 2020 showed that interactions have remained below the disturbance levels previous to the implementation of sweep modifications on non-pelagic trawl gear in 2009. However, both pelagic and non-pelagic trawling effort has been at or above average since 2013. This increase, as well as the inclusion of 2003 - 2014 unobserved fishing events has resulted in an increase to habitat disturbance. The report noted that fishing gear can affect habitat used by a fish species for the processes of spawning, breeding, feeding, or growth to maturity.

The 2021 report for the Aleutian Islands noted that the amount of area trawled increased in 2020 in the Western and Central AI areas, continuing its increasing trend since 2014 and 2015 respectively, then last year a 4-year decline following measures aimed at increasing protection for Steller sea lions during 2012 - 2014. This increase is likely due to a rise in non-pelagic trawl effort. Trawled area remained within 1 to 3% through the time series. A similar downward trend in area trawled in 2020 was observed in the Eastern AI area.

3.1.2.	**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.**

The 2021 Ecosystem Status Report for the Gulf of Alaska noted that many trawl closures have been implemented to protect benthic habitat or reduce bycatch of prohibited species (i.e., salmon, crab, herring, and halibut). Some of the trawl closures are in effect year-round while others are seasonal. In general, year round trawl closures have been implemented to protect vulnerable benthic habitat or vulnerable species' life stages. Seasonal closures are used to reduce bycatch by closing areas where and when bycatch rates had historically been high. In 2001, over 90,000 nm^2 of the Exclusive Economic Zone (EEZ) of Alaska was closed to trawling year-round. Additionally, 40,000 nm^2 were closed on a seasonal basis. State waters are also closed to bottom trawling in many areas. A motion passed by the NPFMC in February 2009 closed all waters north of the Bering Strait to commercial fishing as part of the development of an Arctic Fishery Management Plan (FMP). This additional closure added 148,300 nm^2 to the area closed year-round to bottom trawling. With the Arctic FMP closure included, almost 65% of the U.S. EEZ of Alaska is closed to bottom trawling.

Current status/Appropriateness/Effectiveness: *There is evidence that the objectives described above are in place, and that effective management measures relative to those have been implemented.*	☑

EVIDENCE:
The aforementioned objectives are considered to be long-term and operationalized through federal and state management measures that are reviewed against the objectives on a continuous basis and amended as necessary.

Evidence Basis: *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.*	☑

EVIDENCE:
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.
Evidence of this is found on the GOA and BSAI FMPs and GOA, BSAI ecosystem status reports
Please see supported evidence on the references.

References:
1. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
2. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
3. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf
4. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf
5. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf

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**

9.2.3.4 Supporting Clause 3.1.3.

3.1.3.	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.
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

Federal - State - Stakeholder Process

In February 2014, the NPFMC adopted an Ecosystem Policy that is operationalized across the Council's work, including long-term planning initiatives, fishery management actions, and science planning to support ecosystem-based fishery management. The Ecosystem Policy includes three parts: a value statement, a vision statement, and an implementation strategy. The Policy underpins the Council's sustainable fisheries goals that provide benefits for harvesters, processors, recreational and subsistence users, and fishing communities, and which: (i) are maintained by healthy, productive, biodiverse, resilient marine ecosystems that support a range of services; (ii) support robust populations of marine species at all trophic levels, including marine mammals and seabirds; and (iii) are managed using a precautionary, transparent, and inclusive process that allows for analyses of tradeoffs, accounts for changing conditions, and mitigates threats.

In implementing the Ecosystem Policy, the Council intends that fishery 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. Implementation is intended to be responsive to changes in the ecosystem, and staff understanding of those dynamics, incorporate the best available science, including local and traditional knowledge, and engage scientists, managers, and the public.

The Council established a Plan Team in December 2016 consisting of representatives from various federal and state management and scientific agencies and the NGO community. The Council's action was to advance a Fishery Ecosystem Plan (FEP) for the Bering Sea. The Team's current responsibilities are to (i) develop and update the Core FEP document, (ii) discuss potential and ongoing FEP action modules, (iii) make recommendations to the Ecosystem Committee and the Council about future steps, and (iv) help communicate results to the Council.

A. Bering Sea Fishery Ecosystem Plan (FEP)

With the development of the BS FEP, the Council has progressed on the continuum of EBFM, allowing Alaska to lead internationally in fishery management, and provide a clear record of the Council's ecosystem-based policy decision making, while still applying policies that are suited to Alaskan circumstances. The Plan articulates ecosystem goals and objectives in support of process, research and the ecosystem.

<u>Ecosystem Goals (EG) and Objectives</u>

EG 1: Maintain, rebuild, and restore fish stocks at levels sufficient to protect, maintain, and restore food web structure and function

- Maintain target biomass levels for target species, consistent with optimum yield, using available tools.
- Maintain healthy populations and function of non-target and forage species; and
- Adjust fishing-related mortality from the system to be sustainable and commensurate with total productivity and continue to limit optimum yield to 2 million metric tons for the BSAI groundfish fisheries.

3.1.3.	**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.**

EG 2: Protect, restore, and maintain the ecological processes, trophic levels, diversity, and overall productive capacity of the system.

- Maintain key predator/prey relationships; and
- Conserve structure and function of ecosystem components.

EG 3: Conserve habitats for fish and other wildlife

- Minimize adverse impacts to essential fish habitat, to the extent practicable.
- Avoid and/or minimize impacts to ecologically sensitive habitat, including habitat areas of particular concern (HAPCs); and
- Avoid and/or minimize impacts to seabirds, marine mammals, and protected species.

EG 4: Provide for subsistence, commercial, recreational, and non-consumptive uses of the marine environment.

- Support benefits in the Bering Sea fishery and fishery-related industries.
- Provide opportunities for new entrants in Federal fisheries.
- Promote economic and community stability to all commercial harvesting and processing sectors.
- Support sustainable opportunities and community resilience for subsistence users and Alaska Native communities.
- Provide for directed fisheries including subsistence fisheries by minimizing bycatch mortality; and
- Preserve the ability for stakeholders to derive non-consumptive and cultural value from the Bering Sea ecosystem.

EG 5: Avoid irreversible or long-term adverse effects on fishery resources and the marine environment.

EG 6: Provide a legacy of healthy ecosystems for future generations.
Combined objectives for goals 5 and 6:

- Establish appropriate thresholds to minimize risk of crossing ecosystem tipping points caused by fishery or other human activity.
- Encourage responsible parties to minimize adverse impacts to fish and other wildlife associated with changes in shipping activity, tourism, energy, and other types of development; and
- Ensure that fishery management is sufficiently adaptive to account for the effects of climate change or other ecosystem changes, including loss of sea ice and ocean acidification.

B. Aleutian Islands Fishery Ecosystem Plan (FEP)
In 2007, the Council developed an FEP for the Aleutian Islands, which describes ecosystem processes, and physical, biological, socioeconomic, and management interactions in the area, and includes a qualitative ecosystem risk assessment and description of how risk associated with these interactions is currently being addressed by managers.

The AI Ecosystem Team remit was originally to write the FEP. The Council has requested that the Team remain active, as the designated group to help the FEP serve an effective role in the Council management process. Specific tasks for the team include:

- Refine the FEP on a periodic basis as new information becomes available.
- Bring forward the assessment of FEP indicators and AI modeling to the Plan Teams, on an annual basis.
- Report to the SSC with regard to the FEP indicators and updates to the document, and
- Serve as a conduit for the Council to provide Aleutian Islands FEP information to other agencies, through the Alaska Marine Ecosystem Forum (AMEF).

The reassessment team was unable to locate goals and objectives for the AI FEP. Moreover, there does not appear to be a GOA FEP.

Current status/Appropriateness/Effectiveness: *There are management measures in place to achieve the objectives described in the process parameter. Such objectives may be outlines in overarching fisheries legislation, regulations, or management plans.*	☑

EVIDENCE:
The BS FEP sets goals and objectives for the Bering Sea ecosystem which directs the process by which the Council should manage fisheries, monitor the ecosystem, and prioritize new research through the identification of projects, called Action Modules. To date,

3.1.3.	**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.**

the Council has initiated two Bering Sea Action Modules, and taskforces have been created to accomplish their tasks over the course of 2-3 years. Both Taskforces are represented by Federal (NPFMC, NMFS, ASFC), State (ADNR) and Stakeholders (communities, indigenous organizations) representatives.

The Climate Action Module was initiated by the Council in December 2018, and the Taskforce was formed the following year. The goal of the module is to evaluate the vulnerability of key species and fisheries to climate change and to strengthen resilience in regional fisheries management. The module will address the following objectives: (i) coordinate to synthesize results of various ongoing and completed climate change research projects; (ii) evaluate the scope of impacts on priority species identified in initial studies; (iii) strategically re-evaluate management strategies every 5-7 years; and (iv) include synthesis to evaluate climate-resilient management tools.

The Local Knowledge, Traditional Knowledge, and Subsistence (LKTKS) Action Module was also initiated by Council in December 2018, and the Taskforce formed the following year. The goal of this Action Module is to develop protocols for using LK and TK in management and to understand the impacts of Council decisions on subsistence resources, users, and practices.

Federal and state FMPs for the Pacific Halibut and Sablefish commercial fisheries contain management objectives expressed as management measures that seek to minimize adverse impacts on the structure and function of the ecosystems that are likely to be irreversible or very slowly reversible.

Evidence Basis: *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.*	☑

EVIDENCE:
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 on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.
Evidence of this is found in the NPFMC management policies website, the Bering Sea fisheries ecosystem plan and the Aleutian Islands ecosystem plan
Please see supported evidence on the references.

References:

1. https://www.npfmc.org/how-we-work/management-policies/
2. https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf
3. https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf

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**

9.2.3.5 Supporting Clause 3.2.

Management measures shall provide, inter alia, that:

9.2.3.6 Supporting Clause 3.2.1.

3.2.1	Excess fishing capacity shall be avoided and exploitation of the stocks shall remain economically viable.
Relevance:	Relevant
Evaluation Parameters	**Met?**
Process: *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 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.*	☑

EVIDENCE:

NPFMC - NOAA/NMFS

At the federal level, FMP amendments are supported by accompanying research quantifying fleet capacity. Routine monitoring and ongoing reporting requirements of fishery sectors ensure regular updating on all fishing operations. Equally, at the federal level, NOAA - NMFS's National Plan of Action for the Measurement of Fishing Capacity (2004) includes a number of methods for capacity measurement and assessment. NMFS has published a procedural guide for the review of catch share programs (2017, to be reviewed 2023). The guide also includes the assessment of fishing capacity subsequent to the implementation of a catch share program or a Limited Access Privilege Program.

The MSA's National Standard 8 addresses economic and social considerations and minimizing to the extent practicable adverse economic impacts on fishing communities within the context of preventing overfishing and rebuilding overfished stocks as required under National Standard 1 and other MSA provisions. Calculation of OY as reduced from maximum sustainable yield (MSY) also includes consideration of economic and social factors, but the combination of management measures chosen to achieve the OY must principally be designed to prevent overfishing and rebuild overfished stocks. Conservation and management measures shall, consistent with the conservation requirements of the *Magnuson-Stevens Act* (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that are based upon the best scientific information available in order to:

- Provide for the sustained participation of such communities; and
- To the extent practicable, minimize adverse economic impacts on such communities.

IPHC

The Commission's Pacific Halibut FMP for the Regulatory Areas of Alaska's EEZ (specifically Areas 2C, 3A, 3B, 4A, and 4CDE) includes a suite of management measures that limit and/or reduce the total fishing capacity of the unit of certification consistent with the requirements of the federal *Halibut Act*. Measures include: (i) commercial fishing periods, (ii) closed areas and times, (iii) fishing period limits, (iv) vessel clearance requirements for Areas 2A+4, (v) fishing gear specifications and restrictions, (vi) size limits, (vii) logbook recording and reporting, and (viii) unloading and weighing monitoring.

The FMP is reinforced in accordance with the statutory provisions of the *Northern Pacific Halibut Act* (16 U.S.C. §§ 773 et seq.). The Act also authorizes the NPFMC to develop, and the Secretary of Commerce to implement, additional halibut fishery regulations governing the U.S. portion of Convention waters. These include the contents of FMPs (16 U.S.C. § 1853). Examples of relevant provisions include: (i) the number of vessels involved in the fishery, and (ii) assess and specify the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the specified optimum yield. More importantly, the management measures for the FMP must include a fishery impact statement which shall assess, specify, and analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures on, and possible mitigation measures for, *inter alia,* participants in the fisheries and fishing communities affected by the plan or amendment.

3.2.1	**Excess fishing capacity shall be avoided and exploitation of the stocks shall remain economically viable.**

ADFG

Three major state fisheries exist which are limited entry and are located in Prince William Sound, Chatham, and Clarence Strait. The Prince William Sound sablefish fishery is managed using a GHL and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. For Clarence and Chatham Strait fisheries an annual harvest objective is set with regard to survey and fishery catch per unit effort and biological characteristics of the population.

The state's *Administrative Code* established an upper limit (cap) on the number of entry permits that can be issued by the ADFG's Commercial Fisheries Entry Commission for the state's sablefish fishery. According to 20 AAC 05. 320(e), the maximum number of permits are established as follows:

- NNEI longline fishery - 73
- SSEI Longline fishery - 18; pot fishery - 3
- PWS fixed gear fishery - 49; pot fishery - 1; net fishery - 1

Current status/Appropriateness/Effectiveness: *The fishing capacity of the unit of certification is at or below the level of the specific fishing capacity objective(s).*	☑

EVIDENCE:

Neither fishery is overfished nor is overfishing occurring. Fishing capacity is control by longstanding policies and management measures that are thought to be effective in avoiding excess fishing capacity.

Evidence Basis: *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.*	☑

EVIDENCE:

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. Evidence of this is found on NMFS Guidance for Conducting Review of Catch Share Programs, NMFS Guidelines for economic review for NMFS Regulatory actions, NOAA US National Plan of Action for the management of fishing capacity, IPHC fishery regulations, 16 U.S. Code § 1853 - Contents of fishery management plans, economic status of groundfish fisheries off Alaska reports, commercial fishery entry commission
Please see supported evidence on the references.

References:

1. https://media.fisheries.noaa.gov/dam-migration/01-121-01.pdf
2. https://media.fisheries.noaa.gov/dam-migration/01-111-05.pdf
3. https://media.fisheries.noaa.gov/dam-migration/npoa_managementfishingcapacity_2004.pdf
4. https://www.ecfr.gov/current/title-50/chapter-VI/part-679
5. https://www.iphc.int/uploads/pdf/regs/iphc-2022-regs.pdf
6. https://www.law.cornell.edu/uscode/text/16/1853#b_6
7. https://media.fisheries.noaa.gov/2022-04/Groundfish%20SAFE%202020.pdf
8. https://www.akleg.gov/basis/aac.asp#20.05.320
9. https://www.cfec.state.ak.us/index.htm

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**

9.2.3.7 Supporting Clause 3.2.2.

3.2.2.	The economic conditions under which fishing industries operate shall promote responsible fisheries.
Relevance:	Relevant
Evaluation Parameters	**Met?**
Process: *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 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.*	☑
EVIDENCE: As noted in Supporting Clause 3.2.1, binational, federal and state fishery management organizations have operationalized policies and management measures that limit fishing capacity in waters over which they have jurisdiction. The limitations are characterized by a system of total and individual quotas that are quantitatively defined, regularly monitored, not overfished, and effectively enforced, in combination with capacity reductions that reduce fishing pressure, provide positive incentives to prevent overfishing and promote recovery of rebuilding stocks. Capacity reduction is often one objective of implementing a catch share (IFQ) program.	
Current status/Appropriateness/Effectiveness: *The fishing capacity of the unit of certification is at or below the level of the specific fishing capacity objective(s).*	☑
EVIDENCE: Catches of Pacific Halibut and Sablefish are maintained within established regulatory limits. Management mechanisms such as limited entry, TACs and quota allocations regulate the catch and amount of fishing effort applied to both fisheries. The fishery management organizations have the means to make in-season adjustments to management measures as conditions warrant.	
Evidence Basis: *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.*	☑
EVIDENCE: The availability, quality, and/or adequacy of the evidence substantiates the fleet capacity is monitored, measured and avoided, and mechanisms exist to reduce capacity should it be excess to sustainable resource levels. Please see supported evidence on the references.	
References:	1. Refer to Supporting Clause 3.2.1

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**

9.2.3.8 Supporting Clause 3.2.3.

3.2.3.	The interests of fishers, including those engaged in subsistence, small-scale, and artisanal fisheries shall be taken into account.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑

EVIDENCE:

All main federal and state fisheries management agencies with roles and responsibilities for the Pacific Halibut and Sablefish fisheries have policies and practices in place that encourage and accommodate the involvement of fishers in utilizing their knowledge and experience during the management measure development process. The involvement is manifested by in-person or virtual participation at NPFMC, NOAA-Fisheries (NMFS), ADFG and ABoF regular committee and subordinate committee meetings, special meetings, and outreach activities.

The MSA's National Standard 8 (Communities) stipulates 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 by utilizing economic and social data that meet the requirement of National Standard 2 in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.

The rights and interests of federally recognized native tribes are defined by federal and state laws. NOAA's Administrative Order (NAO) 218-8 describes its Policy on Government-to-Government Consultation with Federally Recognized Indian Tribes and Alaska Native Corporations. The policy is further strengthened by Executive Order (EO) 13175 - Consultation and Coordination with Indian Tribal Governments (2000).

FMPs must examine the social and economic importance of fisheries to communities potentially affected by management measures. For example, severe reductions of harvests for conservation purposes may decrease employment opportunities for fishermen and processing plant workers, thereby adversely affecting their families and communities. Similarly, a management measure that results in the allocation of fishery resources among competing sectors of a fishery may benefit some communities at the expense of others.

Fishers also contribute to the management process by participating in agency-sponsored activities (e.g., surveys) and submitting information of importance to the ongoing management process (e.g., logbook records, at-sea observer deployments, e-tickets).

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

The interests of small-scale fishers who interact with the principal federal and state management agencies by either submitting questions, expressing concerns or offering suggestions will have their interests considered during the consultation process which includes any number of committee and subordinate committee meetings and special sessions. In Alaska, the *Open Meeting Act* stipulates how the engagement is to be managed. For example, the Act requires that:

- All deliberations and action taken by a public entity must be done in public view, with limited exceptions;
- The public must be provided prior knowledge of all steps occurring in the decision-making process, with limited exceptions; and that,
- Individual actions of an official are made known.

3.2.3.	The interests of fishers, including those engaged in subsistence, small-scale, and artisanal fisheries shall be taken into account.

In addition to these engagement processes, the annual quota allocation keys for Pacific Halibut and Sablefish fishers includes specific amounts for the small-scale and indigenous communities sectors.

The NPFMC has recently developed a draft protocol for Identifying, Analyzing, and Incorporating Local Knowledge, Traditional Knowledge, and Subsistence Information in the North Pacific (January 2022). The protocol provides guidance for analytical staff, researchers, and decision-makers working with the Council process.

There is no evidence that small-scale fisheries are adversely impacted by any management measures currently in place.

Evidence Basis: *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.*	☑

EVIDENCE:
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 considered.
Please see supported evidence on the references.

References:

1. https://gov.alaska.gov/wp-content/uploads/sites/2/Open-Meetings-Act.pdf
2. https://www.fisheries.noaa.gov/national/laws-and-policies/national-standard-guidelines
3. https://www.noaa.gov/organization/administration/nao-218-8-policy-on-government-to-government-consultation-with-federally
4. https://www.federalregister.gov/documents/2000/11/09/00-29003/consultation-and-coordination-with-indian-tribal-governments
5. https://meetings.npfmc.org/CommentReview/DownloadFile?p=bd3f84a1-29aa-46f4-8f4b-6c3697fe2d01.pdf&fileName=D2%20LKTKS%20Draft%20Protocol.pdf

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**

9.2.3.9 Supporting Clause 3.2.4.

3.2.4.	Biodiversity of aquatic ecosystems shall be conserved and ETP species shall be protected. Where relevant, there shall be management objectives, and as necessary, management measures.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑
EVIDENCE: In implementing its Ecosystem Policy, the NPFMC intends that fishery 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. Implementation is intended to be responsive to changes in the ecosystem, and staff understanding of those dynamics, incorporate the best available science, including local and traditional knowledge, and engage scientists, managers, and the public. Specific goals and objectives are identified in the Bering Sea Fishery Ecosystem Plan and the Aleutian Islands Fishery Ecosystem Plan. FMPs attributed to the IPHC and the NPFMC contain management objectives and measures that are intended to ensure that the biodiversity of aquatic ecosystems are conserved and ETP species are protected. Pursuant to the MSA, the NPFMC (and NMFS) is required by law to identify and protect the essential fish habitat (EFH) of species managed under FMPs. The organization must describe and identify EFH in fishery management plans, minimize adverse effects of fishing on EFH, and encourage the conservation and enhancement of EFH.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: A suite of management measures developed and monitored by the IPHC, NPFMC, NOAA - NMFS/AFSC and the ABoF are in place for the Pacific Halibut and Sablefish commercial fisheries to ensure that biodiversity of aquatic ecosystems are conserved and ETP species are protected. The measures include seasonal and permanent closed areas and times, as well as fishing gear specifications, for conservation purposes and to protect vulnerable marine ecosystems. Some EFH that is especially important ecologically or particularly vulnerable to degradation may be further designated as “habitat areas of particular concern” (HAPC) to provide additional focus for conservation efforts (50 CFR 660.11 - 79).	
Evidence Basis: *Evidence Basis: 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.*	☑
EVIDENCE: The evidence is sufficient to substantiate that biodiversity of aquatic ecosystems is conserved and ETP species are protected through management objectives and management measures. Please see supported evidence on the references.	

References:	1. Refer to information and associated references included in SC 3.1.3. 2. https://www.govinfo.gov/app/details/CFR-2014-title50-vol13/CFR-2014-title50-vol13-sec660-11 3. https://www.npfmc.org/fisheries-issues/issues/habitat-protections/ 4. https://www.npfmc.org/fisheries-issues/bycatch/protected-species/

3.2.4.	Biodiversity of aquatic ecosystems shall be conserved and ETP species shall be protected. Where relevant, there shall be management objectives, and as necessary, management measures.							
	5. https://www.iphc.int/uploads/pdf/regs/iphc-2022-regs.pdf							
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**

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

9.3.1 Fundamental Clause 4. Fishery data

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

9.3.1.1 Supporting Clause 4.1.

4.1.	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.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *There is a system that allows for effective data collection (including data on retained catch, bycatch, discards and waste) that are reliable and accurate and allow assessment on the status of the Pacific Halibut and Sablefish stocks. Data are collected, at an appropriate time and level of aggregation, by relevant management, scientific, and research organizations connected with the fishery. These are provided to relevant fisheries organizations to support stock management.*	☑

EVIDENCE:

Pacific Halibut

The most recent complete stock assessment consistent with contemporary methods, was completed at the end of 2022, and all fishery removals and mortality of Pacific Halibut are considered in the assessment and management of the stock. Removals begin in 1980 for the stock assessment. A comprehensive suite of data to quantify fishery removals and mortality is collected to support the statistical stock assessment model produced by the International Pacific Halibut Commission. These data are collected using an integrated, well organized, and statistically sound and robust collection scheme. The data collection activities are described comprehensively in the annually produced IPHC stock assessment (1). The collected data of fishery removals are updated annually to include updated data, newly available information and refined to reflect the most current and accurate information available to the IPHC. Data sources relative to management include commercial fishery CPUE, commercial fishery age composition data, and 2021 mortality estimates for all fisheries. Data are aggregated for assessment use to four Biological Regions: Region 2 (Areas 2A, 2B, and 2C), Region 3 (Areas 3A, 3B), Region 4 (4A, 4CDE) and Region 4B and then coastwide.

In addition to the aggregate mortality (across all sizes of Pacific halibut), the data collection includes statistics from both fishery dependent and fishery independent sources as well as auxiliary biological information). The full set of data allow calculation of modelled indices of abundance (2), commercial fishery Catch-Per-Unit- Effort (in weight), and biological summaries from both sources (length, weight, and age composition data). The data quality is considered superior reflecting carefully made collections by trained fisheries samplers and the geographical scope of data is extensive and comprehensive spatially and temporally A detailed summary of input data used in this stock assessment can be found in (1). All data and meta data descriptions are available on the IPHC's webpage (3). A visual representation of the length of each data stream and estimate of associated precision of each input is displayed below (Figure 13).

The collected data of harvest includes information on retained catch in the commercial, recreational and sport fisheries, the catch from subsistence fisheries, as well as estimates of bycatch and discards. Several data reporting systems are in place for the various fishery components to ensure timely and accurate collection and reporting of catch data. These data are reported to, and quality controlled using the system eLandings (4) system, in which data are reviewed by NMFS and entered along with observer data into the catch accounting system (CAS, 5) the latter maintained by NMFS. Data from the eLandings are made available to the three collaborating agencies, i.e., NMFS, IPHC, and ADFG.

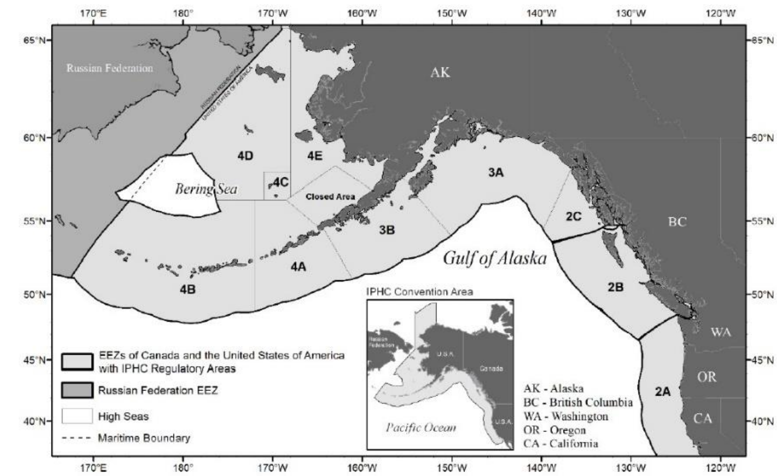

Figure 13. IPHC Convention Area (Insert) and IPHC Regulatory Areas denoting region of data collection.

In the 2022 assessment, Pacific halibut mortality consists of directed/targeted commercial fishery landings and discard mortality including research, recreational fisheries, subsistence, and non-directed discard mortality ('bycatch') in fisheries targeting other species and where Pacific halibut retention is prohibited. All of these data sources are available to the assessment and management entities.

Removals are quantified spatially and temporally in the annual assessment. Over the period 1888-2021 total harvest (mortality from fishing) has totalled 7.3 billion pounds (~3.3 million metric tons, t), ranging annually from 34 to 100 million pounds (16,000-45,000 t) with an annual average of 63 million pounds (~29,000 t) (Figure 14). Annual mortality was above the long-term average from 1985 through 2010 and averaged 38.5 million pounds (~17,500 t) from 2017-21. Coastwide commercial Pacific halibut fishery landings (including research landings) in 2021 were approximately 24.5 million pounds (~11,100 t), up 9% from 2020. Discard mortality in non-directed fisheries was estimated to be 3.5 million pounds in 2021 (~1,600 t), down 23% from 2020 and representing the lowest level in the time-series. Total recreational mortality (including estimates of discard mortality) was estimated to be 7.6 million pounds (~3,470 t) up 43% from reduced fisheries that occurred in 2020. Mortality from all sources increased by 10% to an estimated 37.7 million pounds (~17,100 t) in 2021.

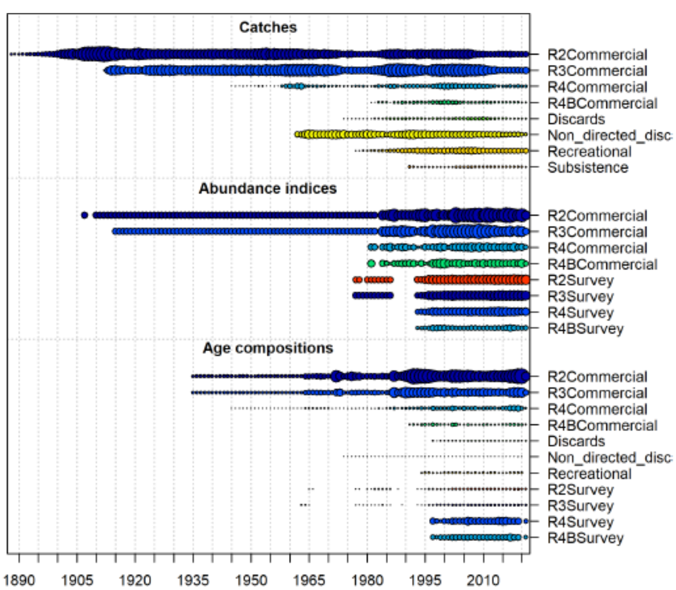

Figure 14. Overview of data sources for Pacific halibut. Circle areas are proportional to magnitude (mortality/catches) or the relative precision of the data (larger circles indicate greater precision for indices of abundance and age composition data.

4.1.	**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.**

Alaska Pacific Sablefish

There is an effective and comprehensive monitoring system to collect fishery removals and estimate mortality of the Alaska Pacific Sablefish stock. These data are fully implemented and made available to management in the quantitative statistical peer reviewed stock assessment. The most recent (terminal year 2022, 6) stock assessment documents all fishery-independent and fishery-dependent data collection activity.

Catch data from Commercial sectors are collected from fixed gear vessels that deploy longline, pot, and collapsible 'slinky pot' designs. The catches used in the 2021 assessment represent total catch (landings plus bycatch or discards assuming 100% mortality) and include catches from minor State-managed fisheries in the northern GOA and in the AI region (1960 to 2021). Fish caught in State waters are reported using the area code of the adjacent Federal waters in the Alaska Regional Office catch reporting system (7), the source of the catch data used in the assessment. Minor State fisheries catches averaged 180 t from 1995 to 1998, about 1% of the average total catch. Most of the Minor State fisheries catch (80%) is from the AI region. Research removals of Alaska Pacific Sablefish are small relative to the fishery catch but substantial compared to the research removals for many other species. These research removals are high because of the annual AFSC longline survey, which is conducted annually because of its cost-recovery design where catch is sold to offset survey costs. Additional sources of significant removals are bottom trawl surveys and the International Pacific Halibut Commission's longline survey.

Sources of catch not included in the assessment model but known to exist by the assessment team are 1) catches from state areas that conduct their own assessments and set Guideline Harvest levels (e.g., Prince William Sound, Chatham Strait, and Clarence Strait), and 2) the sport fishery catch. The sport fishery catch has been increasing in recent years, which occurs primarily in State waters. Total removals from activities other than the directed fishery have been between 239 to 359 t since 2006. These removal estimates equate to less than 1% of the recommended ABC and the assessment team concludes that this source of uncertainty contributes a relatively small added mortality to the sablefish stock.

Commercial fishery landings are reported through two different data collection portals. The first is the "eLandings" system (4), an electronic fish ticket system in operation since. All catch data are required to be reported, including IFQ/CDQ caught sablefish and halibut. Each industry report submitted via eLandings is evaluated (quality control and quality assurance checks are performed) and entered along with observer data into the catch accounting system (CAS) maintained by NMFS. The CAS integrates observer and industry information to determine estimates of total catch. The CAS procedures complement the sampling procedures established under the observer program. Cahalan *et al.* (2014), Hanselman *et al.* (2018), and Goethel *et al.* (2020) (8, 9, 10) provide details on the catch reporting and estimation processes of commercial sablefish catches. The second data collection mechanism in commercial fishery is the Alaska Fisheries Information Network. This was established in 1997 in response to an increased need for detailed, organized fishery information to aid decision-making by managers with the aim of consolidating, managing and dispensing information related to commercial fishing in Alaska. The AFKIN maintains a searchable database of both state and federal commercial landings data for which is Alaska relevant to the needs of scientists and other users. Upon request, AKFIN provides that data in usable formats. AKFIN does not collect data but maintains this library comprised of data from agency sources that includes NMFS Alaska Region, NMFS Alaska Fisheries Science Center, and the Alaska Department of Fish and Game.

By-catch in the directed sablefish fishery are recorded by observers, reported through the CAS, and presented in the annual stock assessments. Sablefish discards in groundfish target fisheries are largest in the hook and line fisheries along with trawl gear types, but the predominant source varies over times and across regions. In both the BSAI and GOA in recent years, trawl gears have constituted the primary source of discards. Generally, discards of sablefish in pot gear in non- sablefish fisheries has been low (pot includes halibut and Pacific cod targeting).

4.1.	**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.**

A unique source of mortality for the Alaska Pacific Sablefish fishery is from marine mammals. Killer whale depredation (predation) has been recorded by observers since 1995 (Figure 15). Killer whales typically depredate Alaska Pacific Sablefish caught on longline gear in the BS, AI, and WG areas and at low levels in the CG. The percentage of sablefish directed sets that are depredated by killer whales is on average 13% in the BS, 1% in the AI, 3% in the WG, and 1% in the CG. Likely, because of small sample sizes, the annual range in the rate of depredation is 3 to 26% in the BS. Observers also record sperm whale depredation; however, determining if sperm whales are depredating can be subjective, because they do not take a large majority of the catch like killer whales do. In the observer data, sperm whale depredation occurs in the GOA and less so in the AI. Depredation in the CG was highest in 2020, at 6%. In the WY and EY/SE areas peaks were around 17% and 18%, respectively, which were the highest rates in the GOA.

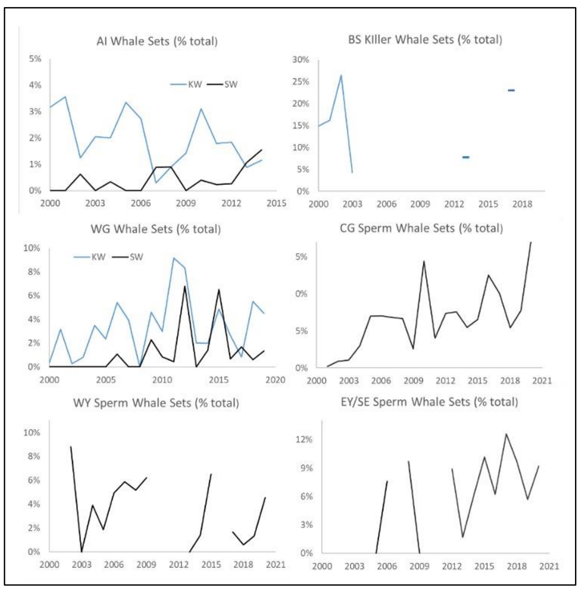

Figure 15. Percentage of human observed sablefish targeted logline sets with whale depredation by FMP subarea. Years with fewer than three vessels were not included due to confidentiality.

Current status: **All significant fishery removals and mortality of the target species Pacific Halibut and Sablefish are considered by management. Reliable and accurate data required for assessing the status of fisheries and ecosystems—including data on retained catch, bycatch, discards, and waste are collected. Data include relevant traditional, fisher, or community knowledge, provided their validity can be objectively verified. These data are 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.**	☑
EVIDENCE: The reader should be directed to refer to the previous section (1) which outlines for both the Pacific Halibut and Alaska Pacific Halibut the description of the comprehensive nature and quality of removals and mortality. The completeness of the records (retained catch, bycatch, discards, and waste) is well documented in the associated assessment documents (1, 6).	
Current status/Appropriateness/Effectiveness: *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,*	☑

4.1.	**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.**

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.

EVIDENCE:
The evidence available to the assessment team supports that all significant fishery removals and mortality of the target species are recorded at a frequency and quality and reported to the relevant management organizations to be used by management for assessment purposes.

Evidence Basis:
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 though a systematic, objective, and well-designed process, and is not just hearsay). Examples may include stock assessment reports, catch data, and observer data. ☑

EVIDENCE:
As documented in the above sections, the significant sources of fishery removals are at an availability and quality to be useful (and they are used) for management. Please see supported evidence on references.

References:

1. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022).
2. Compendium of meeting documents of the 97th Session of the IPHC Annual Meeting.
3. Website of The International Pacific Halibut Commission (IPHC) https://iphc.int/.
4. Website of the 'e-Landings' system, https://elandings.alaska.gov/elandings/Login
5. Website of the Alaska Catch Accounting System, https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-catch-accounting-system.
6. 2021 Assessment Of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska
7. Website of the Alaska Regional Office catch reporting system. https://www.fisheries.noaa.gov/alaska/sustainable- fisheries/alaska-catch-accounting-system
8. Cahalan, Jennifer A., Jason R. Gasper, and Jennifer Mondragon. "Catch sampling and estimation in the federal groundfish fisheries off Alaska." (2014).
9. Hanselman, D. H., Rodgveller, C. J., Fenske, K. H., Shotwell, S. K., Echave, K. B., Malecha, P. W., & Lunsford, C. R. (2018). Assessment of the sablefish stock in Alaska.
10. Goethel, D.R., Hanselman, D.H., Rodgveller, C.J., Fenske, K.H., Shotwell, S.K., Echave, K.B., Malecha, P.W., Siwicke, K.A., and Lunsford, C.R. 2020. Assessment of the sablefish stock in Alaska. In "Stock Assessment

4.1.	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.
	and Fishery Evaluation Report for the Groundfish Resources of the GOA and BS/AI." Anchorage, AK: North Pacific Fishery Management Council. 11. Website for The Alaska Fisheries Information Network (AKFIN). https://www.psmfc.org/program/alaska-fisheries-information-network-akfin.

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):	0

9.3.1.2 Supporting Clause 4.1.1.

4.1.1.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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).*	☑
EVIDENCE: **Pacific Halibut** The NPFMC has substantial information on management of Pacific Halibut. The data production, maintenance, update, and verification of statistical data are made with the greatest possible scrutiny and vetted through a comprehensive peer-reviewed process. These are summarized in the narrative above and also fully described in the Pacific Halibut annual stock assessment and supporting documents (1,2). **Alaska Pacific Sablefish** The data production, maintenance, update, and verification of statistical data collected for the Alaska Pacific Sablefish are made with the greatest possible scrutiny. These data, summarized in reports and executive summaries, are made widely available throughout the assessment process and enable timely resource management, such as quota setting, through the agency websites, publications, and at various public meetings. Data on certain aspects of commercial fishing are confidential, such as individuals or individual vessels in the analysis of fishery CPUE data, depending on the number of individuals or entities involved (3), consistent with the information confidentiality policies of NMFS. The Commercial Fisheries Entry Commission (4) is the designated records manager for ADFG fish ticket records. Fish ticket records are retained by the Commission for 45 years and are confidential as defined by Alaska statutes (AS 16.05.815 and 16.40.155). These laws are concerned with confidential nature of certain reports and records.	
Current status/Appropriateness/Effectiveness: *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. 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.*	☑
EVIDENCE: The evidence of the data production, maintenance, update, and verification of statistical data collected for the Pacific Halibut and Alaska Pacific Sablefish are well documented, and the evidence of best available data use is documented in the stock assessment of each stock under consideration. Data use for each stock assessment requires that all data sources go through a complete and comprehensive quality assurance and vetting process. The description of the data is available in each of the respective stock assessments and discussed above (1,4).	
Evidence Basis: *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*	☑

4.1.1.	**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.**
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.	

EVIDENCE:

Pacific Halibut

The assessment documents of the Pacific Halibut stock indicate that 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. The quality and adequacy of the data are discussed above and well documented in the assessment (1) and supporting documents (2). A term of reference in the stock assessment of Pacific Halibut is to evaluate data quality and adequacy. These meet the needs for fishery management and are vetted through a substantial peer-review process.

Alaska Pacific Sablefish

The assessment and supporting documentation of the Alaska Pacific Sablefish (3) indicate that 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. The quality and adequacy of the data are discussed above and well documented in the assessment and supporting documents. A term of reference in the stock assessment of Alaska Pacific Sablefish is to evaluate data quality and adequacy. These meet the needs for fishery management and are vetted through a substantial peer-review process.

References:

1. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022).
2. Website of The International Pacific Halibut Commission (IPHC) https://iphc.int/.
3. 2021 Assessment Of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska
4. Website for the Commercial Fisheries Entry Commission. https://www.adfg.alaska.gov/index.cfm?adfg=about.cfec.

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):	

9.3.1.3 Supporting Clause 4.1.2.

4.1.2.	**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.**
Relevance:	Not relevant **Note:** If the fishery for the *stock under consideration* is managed fully using stock-specific information then this clause can be scored with full conformance.
	This clause is not relevant for either the Pacific Halibut or Alaska Pacific Sablefish stocks because data collection for each stock, as documented above, are comprehensive and sufficient efforts. These efforts are statistically valid, publicly disseminated, and vetted through peer review.

Evaluation Parameters	**Met?**
Process: *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.*	☐
EVIDENCE:	
Current status/Appropriateness/Effectiveness: *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).*	☐
EVIDENCE:	
Evidence Basis: *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.*	☐
EVIDENCE:	

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

9.3.1.4 Supporting Clause 4.2.

4.2.	An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures shall be established.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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).*	☑

EVIDENCE:

Pacific Halibut

The Pacific Halibut fishery has an extensive observer program since 1990 (1). The North Pacific Observer Program ("Observer Program", administered by NOAA Fisheries) is focused on commercial groundfish and halibut fisheries in the Bering Sea, Aleutian Islands, and Gulf of Alaska (2). The program trains, briefs, debriefs, and oversees over 450 observers annually who collect catch data onboard fishing vessels and also at onshore processing plants, the latter mainly used for in-season management and scientific purposes such as stock assessments and ecosystem studies. The program ensures that the data collected by observers are of the highest quality possible by implementing rigorous quality control and quality assurance processes and routine training for the data collected by observers.

The Observer Program provides the regulatory framework for NOAA Fisheries certified observers to collect data on groundfish and halibut fisheries. The information collected by observers provides the best scientific information to manage the fisheries and to develop measures to minimize bycatch. Observers collect biological samples and fishery-dependent information on total catch and interactions with protected species. Managers use data collected by observers also to monitor quotas, manage groundfish and prohibited species catch, and document and reduce fishery interactions with protected resources. Division staff process data and make it available to the Sustainable Fisheries Division of the Alaska Regional Office for quota monitoring, to scientists at the Alaska Fisheries Science Center for stock assessment, ecosystem investigations, and an array of research investigations (e.g. list a few), as well as the fishing industry itself which relies on observer data to monitor quotas and prohibited species catch (PSC).

In January 2013, NOAA Fisheries changed how observers in the partial coverage category are deployed, how observer coverage in the partial coverage category is funded, and which vessels and processors must have some or all of their operations observed. These changes increased the statistical reliability of data collected by the program, addressed cost inequality among fishery participants, and expanded observer coverage to previously unobserved fisheries. This program information constitutes the Small Entity Compliance Guide required under section 212 of the Small Business Regulatory Enforcement Fairness Act of 1996.

All participants in the federally managed commercial groundfish fisheries off Alaska (except catcher vessels delivering unsorted cod ends to a mothership) are subject to Observer Program requirements. Through the Annual Deployment Plan, NOAA Fisheries has the flexibility to decide when and where to deploy observers in the partial coverage category based on a scientifically defensible deployment plan reviewed annually by the Council. Catcher vessels operating in the halibut IFQ or CDQ are in the 'partial coverage category' Three pools are specified (https://www.fisheries.noaa.gov/alaska/fisheries-observers/north-pacific-observer-program):

1. No-selection pool: The no-selection pool is composed of vessels that will have no probability of carrying an observer on any trips for the 2019 fishing season. These vessels are:
    - fixed-gear vessels less than 40 ft LOA and vessels fishing with jig gear; this category includes handline, jig, troll, and dinglebar troll gear; and
    - four fixed-gear vessels voluntarily participating in EM innovation and research (Appendix D).

4.2.	An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures shall be established.

2. Electronic monitoring (EM) trip-selection pool: NMFS has approved 169 fixed gear vessels in the EM selection pool in 2020. Once NMFS approves a vessel for the EM selection pool, that vessel will remain in the EM selection pool for the duration of the year. Prior to fishing, each vessel must have a NMFS-approved VMP.
3. Observer Trip-Selection Pool: There are 3 sampling strata in the trip-selection pool for the deployment of observers:
    - Hook-and-line: This pool is composed of all vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing hook-and-line gear.
    - Pot: This pool is composed of all vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing pot gear.
    - Trawl: This pool is composed of all vessels in the partial coverage category fishing trawl gear making a trip not covered by the EM EFP, including all trips using non- pelagic gear.
4. Trawl EM trip-selection pool: If the EFP application is approved and fishing occurs in 2020, this pool would be composed of all vessels fishing under the EFP permit.

In the near term (2022) there are no plans for observer coverage on halibut vessels less than 40' LOA. Previous work by the surveillance team, using data provided to the assessment team by a joint NFMS and IPHC effort, indicated that there was high spatial overlap in effort between the two fleets (<40ft fleet and >40ft fleet). The under-40 ft fleet had more near-shore activity in southeast Alaska than the >40ft vessels. We also found that effort for vessels <40ft from 2010-2017 was highest in the Bering 4C area, and 270. Besides Bering 4C, there was high spatial overlap in effort between the two fleets, though the under 40ft fleet had more near-shore activity in southeast Alaska than the >40ft vessels. The catch of halibut (lbs.) corresponded to the level of effort exerted by the two fleets. Bering Sea 4C and 270 both had a high proportion of vessels over 40ft subject to observer coverage (over 75% and 50%, respectively). Observer coverage was low across the southeast region, where <40ft of vessels comprise roughly 50% of the effort in some regions. However, effort and volume of catch of halibut is comparatively low across the SE, and thus of less concern that substantial non-target and ETP interactions are going unrecorded. NMFS expects inshore areas to have relatively lower observer coverage rates than outer areas where relatively greater effort is expended. Based on the observer coverage of vessels >40ft fleet and the IPHC logbook effort data available since 1999, this is believed adequate, and probably representative, observer coverage on the larger fleet in areas where the <40ft fleet operates. Thus, assuming that the catch profiles of the two fleets are similar when fishing in the same statistical area, the collected observer data is believed to be representative of the halibut fishery across the two fleets.

Alaska Pacific Sablefish

An extensive industry-funded cooperative on-board observer program exists in Alaskan waters for Alaska Pacific Sablefish and other groundfish stocks. These provide fishery catch, length and age composition (2). Beginning January 1, 2013, amendment 86 (BSAI) and amendment 76 (GOA) were added to the Federal Fisheries Regulations 50 CFR Part 679: Fisheries of the Exclusive Economic Zone Off Alaska. In compliance with the MSA, these amendments restructured the funding and deployment system for observers in the North Pacific groundfish and halibut fisheries and include some vessels less than 60 ft. in length, as well as halibut vessels in the North Pacific Groundfish Observer Program.

The 2021 Annual Deployment Plan (ADP) documents how the National Marine Fisheries Service (NMFS) assigns fishery observers and electronic monitoring (EM, https://www.npfmc.org/electronic-monitoring-3/) to vessels and processing plants engaged in halibut and groundfish fisheries in the North Pacific. Observer coverage and EM deployment in the partial coverage category is funded through a system of fees based on the ex-vessel value of groundfish and halibut landed by vessels in the partial coverage category. The sampling design for at-sea deployment of observers and EM in the partial coverage category involves three elements: 1) the selection method to accomplish random sampling; 2) division of the population of partial coverage trips into selection pools or strata; and 3) the allocation of deployment trips among strata. NMFS recognizes the challenging logistics of putting observers on small vessels and recommended that vessels less than 40' LOA be in the no selection pool for observer coverage. Fishery information is available from longline sets that target sablefish in the IFQ fishery. Records of catch and effort for these vessels are collected by observers and by vessel captains in voluntary and required self-reported logbooks. Fishery data from the Observer Program is available since 1990. Logbooks are required for vessels over 60 feet beginning in 1999. Since 2000, a longline fishery catch rate index has been derived from observed sets and self-reported logbook data for use in the model and in apportionment calculations. Based

4.2.	An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures shall be established.

on data from NMFS/AFSC/NPFMC, less than 2.5% of the sablefish catch since 2014 was taken by vessels < 40' LOA. The lack of observer coverage in this fishery sector is not considered a major data gap and does not pose a large risk.

Current status/Appropriateness/Effectiveness: *The data collected by the observer program is considered accurate and useful.*	☑

EVIDENCE:
Pacific Halibut and Alaska Pacific Sablefish
The agencies tasked with management and monitoring of the fisheries under consideration, primarily NOAA Fisheries, ADF&G, and IPHC have extensive scientific databases which include halibut. NPFMC has extensive information on management of halibut for public dissemination. Data and data summaries are made widely available through websites, publications and at various publicly attended meetings. Some aspects of commercial fishing data are confidential, such as those data that can be directly ascribed to individuals or individual vessels (e.g., for use in the determination of CPUE). Confidentiality is determined by the number of individuals or entities involved. For the current surveillance report, all necessary documentation such as the stock assessment report, observer report, and other documents, relevant records, and regulations were available on the website for the Pacific Halibut Research & Stock Management (3). On this site, there is all information associated with the stock assessment including computer code and data input files.

These data, accessible to the user, via the IPHC website (iphc.int/data) is extensive and includes:

1. Directed commercial fisheries data.
2. Fishery-independent Setline Survey data.
3. Non-directed commercial discard mortality fisheries.
4. Geospatial data.
5. Recreational fisheries data.
6. Time series data.
7. Subsistence fisheries data.
8. Water column profile data.

Evidence Basis: *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.*	☑

EVIDENCE:
Pacific Halibut and Alaska Pacific Sablefish
The agencies tasked with management and monitoring of the Pacific Halibut and Alaska Pacific Sablefish support and administer and observer program which produces data of adequate and of sufficient quality which are used to support compliance with fishery management measures. As discussed above, these data support, peer-reviewed quantitative stock assessment (4,5).

References:

1. IPHC Pacific Halibut Fishery Regulations: Clearances and Observers or Electronic Monitoring (Sect. 16). IPHC-2019-IM095-PropA4.
2. Website of The North Pacific Observer Program. https://www.fisheries.noaa.gov/alaska/fisheries-observers/north-pacific-observer-program
3. Website of The International Pacific Halibut Commission (IPHC) https://iphc.int/.
4. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC UNDERSECRETARY (I. STEWART & A. HICKS; 15 DECEMBER 2022).
5. Website of The International Pacific Halibut Commission (IPHC) https://iphc.int/.

	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:	Full Conformance

4.2.	An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures shall be established.
(10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)	
Non-conformance Number (if applicable):	

9.3.1.5 Supporting Clause 4.2.1.

4.2.1.	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.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑

EVIDENCE:

As discussed above, for both fisheries under consideration, an observer program is in place that provides quantitative estimates of total catch, discards, and incidental take.

Pacific Halibut

As part of the effort to strive for adequacy of coverage, the IPHC has investigated and implemented minimum data collection standards for Pacific halibut by scientific observer programs (1). The IPHC has identified key elements that should be incorporated. These include: Robust training, debriefing/briefing, certification, and professional development programs for the observers. This ensures high quality data at the time of collection as well as a robust QA/QC process; Statistically sound methods for sampling catch which account for the variance in, and is both representative and unbiased relative to, space, time, vessel size, fishing method, and fishing effort; and Statistically sound sub-sampling design for collecting length, weight, viability, and other biological observation s from Pacific halibut.

The estimation of bycatch and discard mortality removals for each fishery or fishery group requires the estimation of the number and the size composition of the discarded Pacific halibut, categorized by injury or condition; the application of a survival (or a mortality) probability (i.e., discard mortality rate, DMR) to those fish in each category to derive the mortality by category; and, finally, aggregating this mortality by fishery and period (Leaman and Stewart, 2016) (2). Estimates of numbers, size, and condition are obtained from national observer programs.

Estimation of viability of discarded Pacific halibut has been examined in several historical studies involving captive holding experiments, experimental studies of Pacific halibut physiology and response to stressors, survival studies for other species and gears, development of relative viability estimates from condition and injury assessment combined with tag-recapture studies, and modelling studies involving both empirical and experimental observations.

There have been two historical experiments involving capture of Pacific halibut from commercial-type fishing gear and subsequent holding to estimate mortality. One of these experiments (Peltonen 1969) (3) involved longline capture as well as tagging of released fish to estimate long-term survival. The other experiment (Pikitch *et al*., 1996) (4) involved trawl capture and had larger sample sizes but used much shorter holding periods and did not utilize individual fish condition in predicting mortality. Each study had limitations but contributed to our understanding of discard mortality. In addition to these historical experiments there has been a series of more recent holding experiments examining capture and release mortality, using commercial fishing gear and handling practices. These latter experiments were associated with the Commission's development of tagging protocols for a coastwide passively integrated transponder (PIT) tagging experiment (Kaimmer and Geernaert, 2002) (5).

Trawl-induced injuries arise from a variety of sources: compression and bleeding of Pacific halibut in the trawl's codend associated with the weight of the target species; clogging of the gills with sand or mud as the trawl net is dragged across the sea floor; lacerations

4.2.1.	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.

from spines or carapaces of species also caught in the net; and, abrasions from debris or the scales of other species (e.g., sharks), duration of the tow, amount of time on deck before being returned to the water, and potentially predation upon return to the water.

Longline and pot gear capture can result in fewer injuries and, in general, better fish condition at release. However, this is not always the case, especially concerning release from longline gear in cases where careful release methods are not practiced. Longline-capture injuries can occur in the form of torn jaws, injuries to cheeks, facial areas, eyes, and gills arising from hook removal; gaff wounds also associated with hook removal, amphipod predation while on the hook; and potentially predation upon return to the water.

Pot capture injuries are primarily associated with interactions of Pacific halibut with other species in the catch (e.g., lacerations, abrasions from contact with other species or intrusions by sand fleas).

Results from these experiments have been summarized into three condition categories used to categorize Pacific halibut that are discarded in trawl, and pot fisheries; and four categories for longline fisheries (organized as dichotomous keys used by observer programs e.g., AFSC 2015) (6).

The IPHC continues to actively study physiological influences and best practices to both minimize Pacific mortality and refine accuracy to best estimate discards of Pacific halibut.

Alaska Pacific Sablefish
The Observer Program for Alaska Pacific Sablefish provides the regulatory framework for NOAA Fisheries certified observers to collect data (7). The information collected by observers provides the best scientific information to manage the fisheries and to develop measures to minimize bycatch. Observers collect biological samples and fishery-dependent information on total catch and interactions with protected species. Managers use data collected by observers to monitor quotas, manage groundfish and prohibited species catch, and to document and facilitate reductions in fishery interactions with protected resources. Division staff process data and make it available to the Sustainable Fisheries Division of the Alaska Regional Office for quota monitoring, to scientists at the Alaska Fisheries Science Center for stock assessment, ecosystem investigations, and an array of research investigations, as well as the fishing industry itself which relies on observer data to monitor quotas and prohibited species catch (PSC).

The Observer Program is implemented by regulations at subpart E of 50 CFR part 679 which authorize the deployment of observers and EM to collect information necessary for the conservation and management of the Bering Sea and Aleutian Islands and Gulf of Alaska groundfish and halibut fisheries.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
As documented above, 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.

Evidence Basis: *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.*	☑

EVIDENCE:
As documented above, the data collected by the observer program is considered accurate and useful and adequate for providing quantitative estimates of total catch, discards, and incidental takes of living aquatic resources.

References:	1. Website of The International Pacific Halibut Commission (IPHC) https://iphc.int/.

4.2.1.	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.

2. Leaman, B.M., and Stewart, I.J. 2016. 2.12 Research basis for estimated Discard Mortality Rates used for Pacific halibut in longline and trawl fisheries. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2016:133-172.
3. Peltonen, G.J. 1969. Viability of tagged Pacific halibut. Int. Pac. Halibut Comm. Sci. Rep. 52.
4. Pikitch, E.K., Erikson, D., Oddsson, G., Wallace, J., and Babcock, E. 1996. Mortality of trawl-caught and discarded Pacific halibut (*Hippoglossus stenolepis*). Int. Coun. Explor. Sea, Fish Capture Cmttee. CM. 17pp.
5. Kaimmer, S.M. and Geernaert, T.O. 2002. Pilot studies on the use of PIT tags in Pacific halibut. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2001: 301-312.
6. Alaska Fisheries Science Center. 2015. Observer Sampling Manual. Fisheries Monitoring and Analysis Division, North Pacific Groundfish Observer Program, AFSC, 7600 Sand Point Way, Seattle, WA 98115
7. Website of The North Pacific Observer Program. https://www.fisheries.noaa.gov/alaska/fisheries-observers/north-pacific-observer-program

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):	

9.3.1.6 Supporting Clause 4.3.

4.3.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *There is a system within the regional body structure that allows for data distribution in line with confidentiality requirements.*	☑
EVIDENCE: As described above, both fisheries under examination have a regional structure (state agency and the IPHC) that distributes data following all confidentiality requirements (1). When data can be traced back to a single trip or a single harvester, data are pooled for presentation purposes. If the fishery participants are unknown, there must be at least 3 records included for data summaries to be considered non-confidential "Rule of 3". Once an individual has access to the confidential queries, their access and the results of their queries are limited to the program partners with approved access.	
Current status/Appropriateness/Effectiveness: *There is evidence proving that confidentiality requirements are satisfied when data is distributed to the various parties.*	☑
EVIDENCE: Supporting documentation (reviewed above) for both fisheries under examination indicate that all confidentiality requirements are honored and satisfied.	
Evidence Basis: *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 affected.*	☑
EVIDENCE: Supporting documentation (reviewed above) for both fisheries under examination indicate that all confidentiality requirements are honored and satisfied.	

References:	**1.** NAO 216-100: Protection of Confidential Fisheries Statistics. https://www.noaa.gov/organization/administration/nao-216-100-protection-of-confidential-fisheries-statistics

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):	

9.3.1.7 Supporting Clause 4.4.

4.4.	States shall stimulate the research required to support policies related to fish as food.	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *There is research to support policies related to fish as food.*		☑
EVIDENCE: For both fisheries under examination, state and national policies regarding seafood are guided by the Alaska Seafood Marketing Institute (ASMI), U.S. Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), and the U.S. National Institute of Health (NIH). ASMI is the state agency primarily responsible for increasing the economic value of Alaskan seafood through marketing programs, quality assurance, industry training and sustainability certification. ASMI's role includes conducting or contracting for scientific research to develop and discover health, dietetic, or other uses of seafood harvested and processed in the state (1). Through the University of Alaska Fairbanks, the state of Alaska also operates the Kodiak Seafood and Marine Science Center (2), which directs research efforts in several fields, including seafood processing technology, and seafood quality and safety. Socio-economic data collection and economic analyses are required to varying degrees under the Regulatory Flexibility Act (RFA), the MSA, the NEPA, the Endangered Species Act, and other applicable laws. AFSC's Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska (Fissel *et al.*, 2019) (3). This comprehensive report provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indicators for different sectors of the North Pacific fisheries, including sablefish, and relates changes in value, price, and quantity, across species, product, and gear types, to changes in the market. A variety of academic evaluations on impacts of policy making on the social, economic, and institutional factors to support policy. Some examples of this are investigation on ecosystem impacts of alternative management policies (Kroetz *et al.,* 2019) (4), examination of long-term dynamics of sablefish (Zolotov 2021)(5), and examination of the IFQ policy (Matulich and Clark, 2003)(6).		
Current status/Appropriateness/Effectiveness: *There is evidence of this research.*		☑
EVIDENCE: As outlined above, there is evidence of research to support policies of fish as food. Please see supported evidence on references.		
Evidence Basis: *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.*		☑
EVIDENCE: As outlined above, there is evidence of research to support policies of fish as food is well supported by a variety of funding sources. Please see supported evidence on references		
References:	1. Website of Alaska Seafood Marketing Institute. https://www.alaskaseafood.org/industry/quality/ 2. Website of Kodiak Seafood and Marine Science Center. https://alaskaseagrant.org/about/kodiak-seafood-and-marine-science-center/ 3. STOCK ASSESSMENT AND FISHERY EVALUATION REPORT FOR THE GROUNDFISH FISHERIES OF THE GULF OF ALASKA AND BERING SEA/ALEUTIAN ISLANDS AREA: ECONOMIC STATUS OF THE GROUNDFISH FISHERIES OFF ALASKA, 2019. Ben Fissel, Michael Dalton, Brian Garber-Yonts, Alan Haynie, Stephen Kasperski, Jean Lee, Dan Lew, Chang Seung, Kim Sparks, Marysia Szymkowiak, Sarah Wise.2021. Economic and Social Sciences Research Program Resource Ecology and Fisheries Management Division Alaska Fisheries Science Center.	

<table>
<tr><td>4.4.</td><td colspan="8">States shall stimulate the research required to support policies related to fish as food.</td></tr>
<tr><td colspan="2"></td><td colspan="7">4. Kroetz, K., Reimer, M. N., Sanchirico, J. N., Lew, D. K., & Huetteman, J. 2019. Defining the economic scope for ecosystem-based fishery management. Proceedings of the National Academy of Sciences of the United States of America, 116(10), 4188–4193.
5. Matulich, S. C., & Clark, M. L. 2003. North Pacific Halibut and Sablefish IFQ Policy Design: Quantifying the Impacts on Processors. Marine Resources Economics.
6. Zolotov, A. O. 2022. The Long-Term Dynamics of Sablefish (Anoplopoma fimbria) Stocks in the Western Bering Sea and Prospects for their Commercial Exploitation. Russian Journal of Marine Biology 2021 47:7, 47(7), 563–582.</td></tr>
<tr><td colspan="2" rowspan="2">Numerical score:</td><td>Starting score</td><td rowspan="2">–</td><td rowspan="2">(</td><td>Number of EPs <u>NOT</u> met</td><td rowspan="2">x 3</td><td rowspan="2">) =</td><td>Overall score</td></tr>
<tr><td>10</td><td>0</td><td>10</td></tr>
<tr><td colspan="8">Corresponding Confidence Rating:
(10 = High; 4 or 7 = Medium; 1 = Low)</td><td>High</td></tr>
<tr><td colspan="8">Corresponding Conformance Level:
(10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)</td><td>Full Conformance</td></tr>
<tr><td colspan="8">Non-conformance Number (if applicable):</td><td></td></tr>
</table>

9.3.1.8 Supporting Clause 4.5.

4.5.	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.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *There is a system in place for collecting economic, social, marketing, and institutional knowledge of the fisheries.*	☑

EVIDENCE:

Pacific Halibut

Considerable effort has been made for the collection of economic, social, marketing, and institutional knowledge for this fishery (1,2,3). The IPHC, in collaboration with stakeholders through survey participation continues improving the Pacific Halibut multiregional economic impact assessment (PHMEIA) with an intention to: define the economic importance of the Pacific halibut resource and fisheries at the community, regional, and national levels and to contribute to a wholesome approach to Pacific Halibut management that is optimal from both biological and socioeconomic perspective.

The PHMEIA assesses three economic impact (EI) components pertaining to Pacific halibut: direct EIs, indirect EIs and induced EIs.

Direct EIs reflect the changes realized by the direct Pacific halibut resource stock users (fishers, charter business owners), as well as the forward-linked Pacific halibut processing sector (i.e., EI related to downstream economic activities).

Indirect EIs are the result of business-to-business transactions indirectly caused by the direct EIs. The indirect EIs provide an estimate of the changes related to expenditures on goods and services used in the production process of the directly impacted industries. In the context of the PHMEIA, this includes an impact on upstream economic activities associated with supplying intermediate inputs to the direct users of the Pacific halibut resource stock, for example, impact on the vessel repair and maintenance sector or gear suppliers.

Finally, induced EIs result from increased personal income caused by the direct and indirect effects. In the context of the PHMEIA, this includes economic activity generated by households spending earnings that rely on the Pacific halibut resource, both directly and indirectly.

The economic impact is most commonly expressed in terms of output, that is the total production linked (also indirectly) to the evaluated sector. PHMEIA also provides estimates using several other metrics, including compensation of employees, contribution to the gross domestic product (GDP), employment opportunities, and households' prosperity (income by place of residence).

Alaska Pacific Sablefish

For this fishery, there is a system in place for the collection of economic, social, marketing, and institutional knowledge for this fishery. Relevant entities which contribute to these sources of data, for consideration by management. This includes:

Bering Sea Integrated Ecosystem Research Program (4) is a $52 million partnership between the NPRB and the National Science Foundation (NSF) that seeks to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. More than one hundred scientists are engaged in field research and ecosystem modeling to link climate, physical oceanography, plankton, fishes, seabirds, marine mammals, humans, traditional knowledge and economic outcomes to better understand the mechanisms that sustain this highly productive region.

In December 2018 NPFMC adopted the Bering Sea Fishery Ecosystem Plan (BSFEP) (5). The Bering Sea FEP establishes a framework for the Council's continued progress towards ecosystem-based fishery management (EBFM) of the Bering Sea fisheries, and relies and builds on the Council's existing processes, advisory groups, and management practice. The Council noted that adoption of the FEP represents a major milestone in what has been a multi-year process to develop this FEP. The FEP builds from the Council's

4.5.	**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.**

Ecosystem Vision Statement, adopted in 2014, and is a continued commitment by this Council to use the best science to sustainably manage fisheries using a precautionary, transparent and inclusive process.

The BSFEP document identifies management goals and objectives for the FEP and for monitoring of the Bering Sea ecosystem and describes how the FEP framework will support research projects (Action Modules) to address Council priorities. The Council also adopted the five action modules included in the draft, and initiated action on two of them. For year 2019, NPFMC staff will work with the BS FEP Team to bring back workplans for how to manage the workload associated with the initiated modules. The two action modules for the Council to work on are:

- Develop protocols for using Local Knowledge and Traditional Knowledge in management and understanding impacts of Council decisions on subsistence use.
- Evaluate the short- and long-term effects of climate change on fish and fisheries.

Regarding socio-economic data collection, AFSC's Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska. This comprehensive report (Fissel, *et al.*, 2019)(6) provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC discards rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, and relates changes in value, price, and quantity, across species, product, and gear types, to changes in the market. This report includes extensive economic data for the commercial sablefish fishery.

Various studies have been conducted on the economic value of sportfishing in Alaska (e.g., Lew *et al.,* 2015) (7), which include sablefish, although sablefish is not a major target species for sport fishing. The Alaska Seafood Marketing Institute (8) has contracted studies to determine the value of Alaska's seafood industry, and the University of Alaska, Institute of Social and Economic Research conducts research on the economics of various Alaskan fisheries.

Current status/Appropriateness/Effectiveness: *These data are used for ongoing monitoring, analysis, and policy formulation.*	☑

EVIDENCE:

The considerable amount of effort in collecting economic, social, marketing, and institutional knowledge of the fisheries is used for ongoing monitoring, analysis, and policy formulation.

The IPHC's mandate is optimum management of the Pacific halibut resource, which necessarily includes an economic dimension. Fisheries economics is an active field of research around the world in support of fisheries policy and management. Adding the economic expertise to the Secretariat, the IPHC has become the first regional fishery management organization (RFMO) in the world to do so.

Similarly, the Alaska Pacific Sablefish is guided be managed following Optimum yield (OY). Magnuson-Stevens Act section defines "optimum," with respect to the yield from a fishery.

Evidence Basis: *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 ongoing monitoring, analysis, and policy formulation. Examples may include reports on social/cultural/economic value of the resource.*	☑

EVIDENCE:

As described above, the availability and adequacy of the evidence 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 ongoing monitoring, analysis, and policy formulation.

4.5.	**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.**
References:	1. Pacific Halibut Multiregional Economic Impact Assessment (PHMEIA): summary of progress PREPARED BY: IPHC SECRETARIAT (B. HUTNICZAK; 29 OCTOBER & 19 NOVEMBER 2021) 2. Website of The International Pacific Halibut Commission (IPHC) https://iphc.int/. 3. Website of The IPHC, Economic Research, https://www.iphc.int/management/economic-research 4. Website of the Bering Sea Integrated Ecosystem Research Program, https://data.eol.ucar.edu/project/BSIERP 5. Website of the Bering Sea Fishery Ecosystem Plan, https://www.npfmc.org/bering-sea-fishery-ecosystem-plan/ 6. STOCK ASSESSMENT AND FISHERY EVALUATION REPORT FOR THE GROUNDFISH FISHERIES OF THE GULF OF ALASKA AND BERING SEA/ALEUTIAN ISLANDS AREA: ECONOMIC STATUS OF THE GROUNDFISH FISHERIES OFF ALASKA, 2019. Ben Fissel, Michael Dalton, Brian Garber-Yonts, Alan Haynie, Stephen Kasperski, Jean Lee, Dan Lew, Chang Seung, Kim Sparks, Marysia Szymkowiak, Sarah Wise.2021. Economic and Social Sciences Research Program Resource Ecology and Fisheries Management Division Alaska Fisheries Science Center. 7. Lew, D. K., & Larson, D. M. (2012). Economic values for saltwater sport fishing in Alaska: a stated preference analysis. North American journal of fisheries management, 32(4), 745-759. 8. Website of Alaska Seafood Marketing Institute. https://www.alaskaseafood.org/industry/quality/

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):	

9.3.1.9 Supporting Clause 4.6.

4.6	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.
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *Traditional fisher knowledge has been investigated. Note that for highly developed fisheries that knowledge may already have been integrated into fisheries management.*	☑

EVIDENCE:

Pacific Halibut

Ceremonial and subsistence (personal use) fishing is a component of small-scale fisheries for Alaskan Halibut. The subsistence halibut fishery off Alaska was formally recognized in 2003 by the NPFMC and implemented by IPHC and National Marine Fisheries Service (NMFS) regulations (1). The fishery allows the customary and traditional use of halibut by rural residents and members of federally recognized Alaska native tribes. Members of these groups can retain halibut for non-commercial use, food, or customary trade.

Subsistence (formerly called Personal use/subsistence) categories include ceremonial and subsistence removals in the Area 2A treaty Indian fishery; the sanctioned First Nations Food, Social, and Ceremonial (FSC) fishery conducted in British Columbia; federal subsistence fishery in Alaska; and U32 halibut retained in Areas 4D and 4E under IPHC regulations. Details for these were reviewed in the 2018 stock assessment documentation (Stewart and Webster, 2018). Specific details on what constitutes subsistence use are also documented in the federal register (US), Title 50, Chapter III, Part 300, Subpart E. This is the implementation the North Pacific Halibut Act of 1982 (Act). The subpart is intended to supplement, not conflict with, the annual fishery management measures adopted by the International Pacific Halibut Commission (Commission) under the Convention between the United States and Canada for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea (Convention) (2).

Landings from this sector are collected and available on the IPHC's website:

Table 17. Subsistence Fishery Removals

(t = net lb * 0.000453592)
Original subsistence values in millions of pounds to an accuracy of three decimal places were converted to the values below in tonnes

Subsistence Fishery Removals

IPHC Regulatory Area	Year										
	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
2A	19	15	13	12	13	15	14	13	15	11	11
2B[1]	184	184	184	184	184	184	184	184	184	184	184
2C[2]	166	166	166	198	198	192	192	180	180	176	193
3A[2]	85	85	85	101	101	109	109	115	115	121	142
3B[2]	8	8	8	6	6	6	6	7	7	10	10
4A[2]	6	6	6	4	4	4	4	4	4	6	7
4B[2]	1	1	1	0	0	0	0	1	1	0	0
4C[2]	2	2	2	2	2	2	2	1	1	1	5
4D[2]	0	0	0	0	0	0	0	0	0	0	1
4E[2]	11	11	11	19	19	32	32	4	4	3	5
4D/4E[2] (CDQ U32)	1	3	5	3	2	2	2	5	9	8	4
Total	483	481	480	529	529	546	546	513	519	519	561

[1] British Columbia, CANADA estimates from Fisheries and Oceans Canada/Pêches et Océans Canada have remained consistent from 2010-2020.

[2] Alaska, USA estimates were carried over for the 2013 estimates from 2012, for the 2015 estimates from 2014, for the 2017 estimates from 2016, and for the 2020 estimates from 2019, with the exception that 4D/4E subsistence harvest in the CDQ fishery were updated.

4.6	**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.**

Alaska Pacific Sablefish

The sablefish fisheries in Alaska are well established and any original knowledge and technologies have been part of the evolution of the mature fisheries. Virtually all data from the state and federally managed sablefish fisheries are included in the stock assessments (NOAA Species Directory, https://www.fisheries.noaa.gov/species/sablefish).

There is minimal recreational, personal use, or subsistence fishing for sablefish in Alaskan waters in comparison with the directed fisheries, and all estimates are included in the catch data.

At the 2012 Alaska BOF meeting, a regulation was passed to require personal use and subsistence use sablefish permits, and at the 2015 BOF meeting, limits were defined for personal use sablefish fisheries for the number of fish, number of permits per vessel, and number of hooks (3).

Current status/Appropriateness/Effectiveness: *There are records of the documentation of small-scale fisher practices.*	☑

EVIDENCE:

There are records of the documentation of small-scale fishery practices, though these fisheries are large-scale and generally the take of fish by small scale fishers is small. These are well described in the assessment documents.

Evidence Basis: *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.*	☑

EVIDENCE:

There are records of the documentation of small-scale fishery practices, though these fisheries are large-scale and generally the take of fish by small scale fishers is small. These are well described in the assessment documents.
Please see supported evidence on references.

References:

1. Website of The International Pacific Halibut Commission (IPHC) https://iphc.int/.
2. Sub-sub-series R3866/3D/30786 - Convention between the United States of America and Canada revising the Convention for the preservation of the halibut fishery of the Northern Pacific Ocean and Bering Sea, signed at Ottawa, 29 January 1937. https://archives.ungeneva.org/convention-between-the-united-states-of-america-and-canada-revising-the-convention-for-the-preservation-of-the-halibut-fishery-of-the-northern-pacific-ocean-and-bering-sea-signed-at-ottawa-29-january-1937
3. Website for Southeast Alaska Personal Use Groundfish Fishery. https://www.adfg.alaska.gov/index.cfm?adfg=PersonalUsebyAreaSoutheastGroundfish.regs

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):	

9.3.1.10 Supporting Clause 4.7.

4.7	**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.**
Relevance:	Relevant **Note:** If the stock is fully managed by one State and there is no need for shared stock research (between two or more States), then this clause is not applicable.

Evaluation Parameters	**Met?**
Process: *There is a system in place to manage the conduct of research vessels operating in waters of other States.*	☑
EVIDENCE: **Pacific Halibut** The major scientific activity for Pacific Halibut is the annual setline survey conducted by IPHC, using commercial vessels from USA and Canada (Ualesi *et al*., 2022) (1). In 2018 the survey encompassed both nearshore and offshore waters of southern Oregon, Washington, British Columbia, southeast Alaska, the central and western Gulf of Alaska, Aleutian Islands, and the Bering Sea continental shelf (Erikson *et al.,* 2019) (2). Thus, only the waters under jurisdiction of USA and Canada, the two countries involved in IPHC, were surveyed. Survey activities were compliant with all laws and regulations of those countries, registered commercial halibut vessels were chartered, and all catches in the survey were recorded and reported. **Alaska Pacific Sablefish** Data from the annual setline survey conducted by IPHC, using commercial vessels from USA and Canada, are considered in the annual sablefish assessments (3). In 2018 the survey encompassed both nearshore and offshore waters of southern Oregon, Washington, British Columbia, southeast Alaska, the central and western Gulf of Alaska, Aleutian Islands, and the Bering Sea continental shelf. Thus, only the waters under jurisdiction of USA and Canada were surveyed. Survey activities were compliant with all laws and regulations of those countries, registered commercial halibut vessels were chartered, and all catches in the survey were recorded and reported. Other scientific surveys used directly, or considered, in the sablefish stock assessments include NMFS annual setline and trawl surveys in GOA and BSAI, surveys by ADF&G in state waters, and a trap survey by DFO (Canada) in British Columbia.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: As discussed above, there is record of such shared research activities and evidence they comply with required regulations for both fisheries under examination.	
Evidence Basis: *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.*	☑
EVIDENCE: As discussed above, there is record of such shared research activities and they comply with required regulations for both fisheries under examination. Please see supported evidence on references.	

References:	1. Ualesi, K., Wilson, D., Jones, C., Rillera, R., and Jack, T. 2022. IPHC Fishery Independent Setline Survey (FISS) design and implementation in 2021. IPHC-2022-AM098-07. 13 p. 2. Erikson, L.M., Soderlund, E., and Geernaert, T. 2019. Fishery-independent setline survey (FISS) design and implementation in 2018, including current and future expansions [online]. International Pacific Halibut Commission. Available from https://iphc.int/uploads/pdf/am/2019am/iphc-2019-am095-06.pdf. 3. Hanselman, D. H., Rodgveller, C. J., Fenske, K. H., Shotwell, S. K., Echave, K. B., Malecha, P. W., & Lunsford, C. R. (2018). Assessment of the sablefish stock in Alaska.

Numerical score:	**Starting score**	**–**	**Number of EPs NOT met**	**x**	**3**	**=**	**Overall score**

4.7	**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.**									
		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):										

9.3.1.11 Supporting Clause 4.8.

4.8.	**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.**
Relevance:	Not relevant **Note:** If the stock is fully managed by one State and there is no need for shared stock research (between two or more States), then this clause is not applicable.
	This clause is not relevant because for the Pacific Halibut fishery, both fishery and survey research activities occur and are carried out within the jurisdictions of the USA and Canada EEZ. No activities occur in the high seas outside the 200 nm EEZ of the US and Canada. This clause is not relevant for the Alaska Pacific Sablefish fishery. As this stock of sablefish is not distributed in high seas areas, there is no research conducted in those waters. Sharing of sablefish information between Canada and USA, for research carried out in their EEZs, is accomplished through the stock assessment process, e.g., results from the stratified random trap surveys conducted in Canadian waters by DFO are available to NMFS scientists and included in the annual SAFE stock assessment reports.

Evaluation Parameters	**Met?**
Process: *There is a mechanism in place to allow the development and review of guidelines governing fisheries research conducted on the high seas.*	☐
EVIDENCE:	
Current status/Appropriateness/Effectiveness: *There is a record of uniform high seas research guidelines or a mechanism to create them.*	☐
EVIDENCE:	
Evidence Basis: *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.*	☐
EVIDENCE:	

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

9.3.1.12 Supporting Clause 4.9.

4.9	**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.**	
Relevance:	Not relevant. **Note**: This clause is only applicable when the unit of certification includes a transboundary, shared, straddling, highly migratory or high seas stock, which is fished by one or more developing States.	
	Not applicable, operations of the fishery take place in USA and Canada; these areas are not considered developing countries.	
Evaluation Parameters		**Met?**
Process: *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.*		☐
EVIDENCE:		
Current status/Appropriateness/Effectiveness: *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.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

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

9.3.1.13 Supporting Clause 4.10.

4.10.	**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.**	
Relevance:	Not relevant. **Note**: This criterion does not apply to fully developed fisheries, as defined by the FAO. The FAO definition of a developed fishery is *"a fishery which, following a period of rapid and steady increase of fishing pressure and catches, has reached its level of maximum average yearly production. It is usually understood that such a fishery is yielding close to its maximum sustainable yield."*	
	Not applicable, operations of the fishery take place in USA and Canada.	
Evaluation Parameters		**Met?**
Process: *There is a mechanism to allow a national organization to render technical and financial support to the State.*		☐
EVIDENCE:		
Current status/Appropriateness/Effectiveness: *There is a record of the provided technical and financial support.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

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

9.3.1.14 Supporting Clause 4.11.

4.11.	**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.**
Relevance:	Not relevant. **Note**: This clause is relevant where the fishery is within a developing region/small island region and management of the resource is performed through an international organization.
	Not applicable, operations of the fishery take place in USA and Canada; these areas are not considered developing countries.

Evaluation Parameters	Met?
Process: *The international management component of the fishery is engaged in processes that support the fishery based in developing countries.*	☐
EVIDENCE:	
Current status/Appropriateness/Effectiveness: *There is a record of the provided technical and financial support.*	☐
EVIDENCE:	
Evidence Basis: *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.*	☐
EVIDENCE:	

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

9.3.2 Fundamental Clause 5. Stock assessment

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.

9.3.2.1 Supporting Clause 5.1.

5.1.	**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.**
Relevance:	Relevant
Evaluation Parameters	**Met?**
Process: *There is an established institutional framework for fishery management purposes that determines applied research needs and use.*	☑

EVIDENCE:

Pacific Halibut

The International Pacific Halibut Commission (IPHC) was established in 1923 by a Convention between the governments of Canada and the United States of America (1). Its mandate is research on and management of the stocks of Pacific Halibut within the Convention waters of both nations. The IPHC receives funding from both the U.S. and Canadian governments to support a director and staff. The IPHC is composed of professional scientists, researchers, and statisticians tasked with providing research and stock assessment on Pacific Halibut for conservation and management purposes. Appropriate processes exist to ensure proper planning of research projects, as well as ongoing peer review of stock assessment and research activities. The quality, quantity and impact of IPHC's publications are noteworthy. IPHC staff members are involved in collaborative projects with other researchers and institutions.

Alaska's Pacific Halibut stock assessment program is extensive and comprehensive. The primary focus of the stock assessment is to assess data and research needs for completion of the stock assessment and subsequent management. Primary sources of information for this assessment include indices of abundance from the IPHC's annual fishery- independent setline survey (numbers and weight) and commercial CPUE (weight), and biological summaries (length-, weight-, and age- and sex-composition data). Other data from NMFS trawl surveys in the eastern Bering Sea and GOA, as well as from various tagging programs, are also collected and analyzed. Research capacity in environmental science is also extensive as outlined in previous clauses, and below. For each of these data sources, the assessment team identifies needs that focuses, in part, in reducing uncertainties in the stock assessment.

Research priorities closely linked with stock assessment uncertainties have been explored through specific sensitivity analyses conducted in 2020 and 2021. In addition to those factors described above, these analyses have included the effects of unobserved whale depredation, and trends in spawning output (due to skip spawning or changes in maturity schedules) and the results have supported the prioritization of maturity, fecundity and skip spawning as current and near-term research foci.

The IPHC produces the "IPHC 5-year Biological and Ecosystem Science Research Plan: Update" (2)

These activities are summarized in five broad research areas designed to provide inputs into stock assessment and the management strategy evaluation processes, as follows:

1) Migration and Distribution. Studies are aimed at further understanding reproductive migration and identification of spawning times and locations as well as larval and juvenile dispersal.
2) Reproduction. Studies are aimed at providing information on the sex ratio of the commercial catch and to improve current estimates of maturity.
3) Growth and Physiological Condition. Studies are aimed at describing the role of some of the factors responsible for the observed changes in size-at-age and to provide tools for measuring growth and physiological condition in Pacific halibut.
4) Discard Mortality Rates (DMRs) and Survival. Studies are aimed at providing updated estimates of DMRs in both the longline and the trawl fisheries.

5.1.	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.

5) Genetics and Genomics. Studies are aimed at describing the genetic structure of the Pacific halibut population and at providing the means to investigate rapid adaptive changes in response to fishery-dependent and fishery-independent influences.

A primary focus to determine research needs, in the assessment context (3), is to use retrospective analysis. Retrospective analyses were performed in the most recent 2022 assessment. This exercise consists of sequentially removing the terminal year's data and rerunning the assessment model and evaluating changes in key quantities (e.g., fishing mortality, spawning biomass, recruitment estimates). This is commonly done for five or more years; however, the current models, restructured for the 2019 stock assessment around estimation of commercial fishery selectivity separately for males and females, rely on sex-ratios-at-age which are only available from 2017-2021. Therefore, the retrospective for this year's assessment does not go beyond five 'peels', each cumulatively removing one year of data (2022, 2021-2022, 2020-2022, 2019-2022, and 2018-2022). Estimates for relative male and female selectivity parameters become less certain with reduced data and required at least one year of data for reliable estimation and preferably more. As data accumulate since this change in model structure the retrospective analyses will be more informative of recent data effects rather than being affected by lack of information to inform selectivity differences. Evidence of retrospective patterns are frequently used to identify model structural issues and to identify systematic problems in data.

Alaska Pacific Sablefish
The mission of the NOAA Fisheries is to conduct scientific research to generate data and analysis for understanding, managing, and sustaining living marine resources. Appropriate, adequate, and directed research is conducted for the management of sablefish in Alaska waters. NMFS and ADFG conduct surveys on sablefish in Alaskan waters. The NOAA Fisheries conducts an annual longline survey and a biennial trawl survey in the GOA and the Aleutian Islands (alternating years between the two regions), and an annual trawl survey in the Eastern Bering Sea and ADFG performs annual longline surveys in Chatham and Clarence Strait. These surveys provide estimates of CPUE, relative abundance, and biological data. In addition, tagging studies exist to study sablefish movement for federal, state, and Canadian waters.

In the 2021 sablefish stock assessment (4) moderate changes to the assessment methodology were implemented. The increasing retrospective patterns in recent recruitment estimates were persistent as new data were added to the model. Since 2017, maximum Acceptable Biological Catch (ABC) projections based on model "16.5_Cont" using the North Pacific Fishery Management Council's (NPFMC) tier 3 FMP B40% harvest control rule (HCR) had been deemed unreliable for sablefish due to overly optimistic population growth forecasts. For the 2021 SAFE, multiple model updates are being proposed, including refinements to the biological inputs, new selectivity and catchability parametrizations, and improved data reweighting approaches, all of which have helped to address retrospective patterns. The sablefish assessment authors explored a number of alternative models using a thorough model development exercise and a new model configuration was developed. The final proposed model for the 2021 SAFE, "21.12_Proposed_No_Skip_Spawn" resolves the recruitment estimation issues associated with model "16.5_Cont" and ABC projections are once again deemed adequate for the basis of management advice.

The assessment document includes extensive treatment of Ecosystem and Socioeconomic Profile and the evaluation of trawl removals of small sablefish in the Bering Sea have both been updated with new data for 2021. Biological characteristics describing updates to weight and growth, maturity, model updates and new parametrizations, and a description of the final proposed model updates and the full factorial model building exercise are included.

In addition to the annual stock assessment and its related/supporting work, extensive research is ongoing in Alaskan waters which have relevance for the sablefish stock and Alaskan ecosystems.

This work includes:
North Pacific Research Board (NPRB) (5)
The NPFB conducts research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean prioritizing on research efforts designed to address pressing fishery management or marine ecosystem information needs.

5.1.	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.

Bering Sea Integrated Ecosystem Research Program (6) is a $52 million partnership between the NPRB and the National Science Foundation (NSF) that seeks to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. More than one hundred scientists are engaged in field research and ecosystem modeling to link climate, physical oceanography, plankton, fishes, seabirds, marine mammals, humans, traditional knowledge, and economic outcomes to better understand the mechanisms that sustain this highly productive region.

The Gulf of Alaska Integrated Ecosystem Research Project (IERP, 7) is a program of the NPRB that seeks to understand how environmental and anthropogenic processes, including climate change, affect trophic levels and dynamic linkages among trophic levels, with emphasis on fish and fisheries, marine mammals, and seabirds within the GOA. Implementation of the GOA IERP is structured around four separately completed components which willing together to form a fully integrated ecosystem study in the Gulf of Alaska. The four components of this program are Upper Trophic Level, Forage Base, Lower Trophic Level and Physical Oceanography, and Ecosystem Modelling.

The Alaska Climate Integrated Modelling (ACLIM) project (8) is a collaboration of diverse researchers aimed at giving decision makers critical information regarding the far-reaching impacts of environmental changes in the Bering Sea. To better predict and respond to future changes, the ACLIM project will develop cutting-edge and multi-disciplinary models. The models will consist of alternative climate scenarios and the associated estimates of potential impacts or benefits to people, industry, and the Bering Sea ecosystem. The ACLIM team has 19 members and includes oceanographers, ecosystem modelers, socioeconomic researchers and fishery management experts from NOAA Alaska Fisheries Science Center, NOAA Pacific Marine Environmental Laboratory, the University of Washington Joint Institute for the Study of Atmosphere and Ocean (JISAO) and School of Aquatic and Fishery Sciences (SAFS) and the Norwegian Institute for Water Research (NIVA).

The North Pacific Marine Science Organization (PISCES, 9) is an intergovernmental scientific organization, established in 1992 to promote and coordinate marine research in the northern North Pacific and adjacent seas. Its present members are Canada, Japan, People's Republic of China, Republic of Korea, the Russian Federation, and the United States of America. Its scientific program named FUTURE[33] (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems) is an integrative program undertaken by the member nations and affiliates of PICES to understand how marine ecosystems in the North Pacific respond to climate change and human activities.

Current status: *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.*	☑

EVIDENCE:
Above, we document the extensive institutional effort and applied research to support fisheries management of the stocks under consideration.

Current status/Appropriateness/Effectiveness:	☑

EVIDENCE:
Above, we document the extensive institutional effort and applied research to support fisheries management of the stocks under consideration.

Evidence Basis: *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.*	☑

EVIDENCE:

5.1.	**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.**

Above, we document the availability and adequacy of institutional effort and applied research to support fisheries management of the stocks under consideration. Please see supported evidence on references.

References:

1. Website of The International Pacific Halibut Commission (IPHC) https://iphc.int/.
2. IPHC 2019. International Pacific Halibut Commission Seattle, WA, U.S.A. IPHC–2019–BESRP-5YP, 13 pp.
3. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022).
4. 2021 Assessment Of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska
5. North Pacific Research Board. https://nprb.org/
6. Website of the Bering Sea Integrated Ecosystem Research Program, https://data.eol.ucar.edu/project/BSIERP
7. Website of The Gulf of Alaska Integrated Ecosystem Research Project, https://nprb.org/gulf-of-alaska-project/
8. Website of The Alaska Climate Integrated Modeling Project, https://www.fisheries.noaa.gov/alaska/ecosystems/alaska-climate-integrated-modeling-project#:~:text=The%20Alaska%20Climate%20Integrated%20Modeling%20project%20(ACLIM)%20represents%20a%20comprehensive,%2D%2D%20to%20varying%20climate%20conditions.
9. Website of The North Pacific Marine Science Organization. https://meetings.pices.int/

	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):	

9.3.2.2 Supporting Clause 5.1.1.

5.1.1.	**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.**	
Relevance:	Not relevant **Note.** If the fishery for the stock under consideration has sufficient data collected through regular stock assessment activities for its management, then this clause can be scored with full conformance.	
	This clause is not relevant because both fisheries are not small-scale or low value with great uncertainty about status. Instead, both are fisheries characterized by adequate and sufficient data collection and analysis of the stock and the fishery.	
Evaluation Parameters		**Met?**
Process: *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.*		☐
EVIDENCE:		
Current status/Appropriateness/Effectiveness: *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.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

Numerical score:	**Starting score**	–	(	**Number of EPs NOT met**	x	3	)	=	**Overall score**
	10								

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

9.3.2.3 Supporting Clause 5.1.2.

5.1.2	**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.**
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *There are organizations and processes in place to permit research into the aspects of fisheries listed in the clause.*	☑

EVIDENCE:

As discussed above, the fisheries management organizations overseeing Pacific Halibut and Alaska Pacific Sablefish ensure that research is conducted on all aspects of both fisheries.

Pacific Halibut

As described above, the Pacific Halibut stock assessment program is extensive and comprehensive (1,2). A primary focus of the stock assessment is to assess data and research needs for completion of the stock assessment and subsequent management. Primary sources of information for this assessment include indices of abundance from the IPHC's annual fishery- independent setline survey (numbers and weight) and commercial CPUE (weight), and biological summaries (length-, weight-, and age- and sex-composition data). Other data from NMFS trawl surveys in the eastern Bering Sea and GOA, as well as from various tagging programs, are also collected and analysed. Research capacity in environmental science is also extensive as outlined in previous clauses, and below. For each of these data sources, the assessment team identifies needs that focuses, in part, in reducing uncertainties in the stock assessment.

Analysis of data, meta data, collection protocols, and data of the biology, ecology, technology, environmental science, and economics are documented on the IPHC website.

The IPHC ensures the availability of research facilities and provide appropriate training, staffing, and institution building to conduct the research and this is achieved through the strategic goals that at the organizational and management levels. These goals are to develop and maintain core scientific programs to fulfill the mandate:

1. identify knowledge gaps and priorities for ecologically sustainable management,
2. develop scientific programs to address knowledge gaps,
3. acquire resources necessary for program execution,
4. communicate results in a professional, understandable, and timely manner for both scientific, stakeholder, and tribal communities,
5. ensure ongoing scientific review of programs; and
6. provide decision-makers with rigorous, best-available scientific advice, to support their decision making.

Alaska Pacific Sablefish

Alaska's sablefish stock assessment and research programs (NMFS, ADF&G) are robust, extensive, and comprehensive (3). The process to determine the stock removals used in the assessment and management considerations is described above. Similarly, research capacity in environmental science is also substantial. The state of the sablefish stock is monitored mainly through survey and the resulting patterns are evaluated in the context of peer-reviewed stock assessment which is comprised primarily of an age-structured statistical model.

The Alaska Department of Fish and Game (ADF&G) evaluates stock status and establishes the SSEI AHO using commercial fishery and survey catch per unit effort (CPUE) data, fishery and survey biological data (age, weight, length, and maturity), and stock status trends of sablefish populations in surrounding geographic areas. For state-managed fisheries, ADF&G has a well- developed research

5.1.2	**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.**

capacity (4) and conducts stock assessments in State waters to determine safe harvest levels. In 1988, the department began annual longline research surveys in both Southeast inside sub-districts where the majority of state fleet fishing effort is focused, in order to assess the relative abundance of sablefish over time and differing environmental conditions. Biological data is also collected during the surveys and ADF&G has standardized its survey methods with the NMFS longline survey. These data are presented and reviewed as part of the overall annual sablefish assessment process, and ADF&G scientists participate in the NPFMC Plan Team.

The Prince William Sound sablefish fishery is managed using a GHL (5) and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. For the Clarence and Chatham Strait fisheries (Southeast Inside areas) an annual harvest objective is set with regard to survey and fishery catch per unit effort and biological characteristics of the population. In addition, in Chatham Strait an annual stock assessment is performed which is based, in part, on estimates from mark-recaptured individuals.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
Above, we document the extensive institutional effort and applied research to support research of the stocks under consideration.

Evidence Basis: *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.*	☑

EVIDENCE:
Above, we document the extensive institutional effort and applied research to support research of the stocks under consideration.

References:

1. Website of The International Pacific Halibut Commission (IPHC) https://iphc.int/.
2. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022).
3. 2021 Assessment Of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska
4. Website of the Alaska Department of Fish and Game, https://www.adfg.alaska.gov/
5. Commercial Groundfish Fisheries Prince William Sound Management Area. https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareapws.groundfish

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):	

9.3.2.4 Supporting Clause 5.2.

5.2.	**There shall be 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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

Pacific Halibut

The Bering Sea Project, a partnership between the NPRB and the National Science Foundation, is studying the Bering Sea ecosystem from atmospheric forcing and physical oceanography to humans and communities, as well as socio-economic impacts of a changing marine ecosystem. Scientists and researchers from a number of agencies and universities are involved. Ecosystem modelling, sound data management and education and outreach activities are included in the program.

Since 2002, IPHC has been working cooperatively with the Alaska Department of Environmental Conservation (ADEC) in a project monitoring environmental contaminants in Alaskan fish. Over 91 species of fish have been studied, include salmon (5 species), pollock, P. cod, lingcod, black rockfish, sablefish, and Pacific Halibut. The fish are analyzed for organochlorine pesticides, dioxins, furans, polybrominated diphenyl ethers, PCB congeners, methyl mercury and heavy metals (arsenic, selenium, lead, cadmium, nickel, and chromium). As per the most recent IPHC report (Dykstra, 2018) (1), over 2,700 samples of Pacific Halibut have been tested by ADEC. Results from analysis of persistent organic pollutants found that in general these compounds are either undetectable in halibut or well below other marine fish species. This is a positive finding and is likely attributable to the lower fat content in halibut compared to these other species.

As part of IPHC's annual setline survey, which provides data for the sablefish assessment, IPHC conducts an extensive oceanographic monitoring program which includes waters off British Columbia, and into the Gulf of Alaska, Bering Sea, and Aleutian Islands (Sadorus and Walker, 2018). The IPHC is collaborating with the Joint Institute for the Study of the Atmosphere and Ocean (JISAO) at the University of Washington and NOAA's Pacific Marine Environmental Laboratory to process the oceanographic data and make them publicly accessible, and a number of years of data up to 2014 are currently available.

In addition to the oceanographic monitoring done by IPHC, other data on ecosystem impacts are collected and presented in the annual IPHC reports. These studies include data on seabird occurrence (Geernaert, 2011) (2) and impacts of marine mammal on setline depredation (Wong 2016). As part of its annual management process for Alaskan groundfish, NPFMC also receives extensive presentations on the status of Alaska's marine ecosystems (GOA and BS/AI) at its SSC and Advisory Panel meetings. The Ecosystem Considerations reports are produced annually to compile and summarize information about the status of the Alaska marine ecosystems for the NNPFMC, the scientific community and the public. As of 2018, 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 assessments, and ecosystem-based management indicators that together provide context for ecosystem-based fisheries management in Alaska.

Alaska Pacific Sablefish

The mission of the NOAA Fisheries is to conduct scientific research to generate data and analysis for understanding, managing, and sustaining living marine resources. Appropriate, adequate, and directed research is conducted for the management of sablefish in Alaska waters. NMFS and ADFG conduct surveys on sablefish in Alaskan waters. The NOAA Fisheries conducts an annual longline survey and a biennial trawl survey in the GOA and the Aleutian Islands (alternating years between the two regions), and an annual

5.2.	There shall be 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.

trawl survey in the Eastern Bering Sea and ADFG performs annual longline surveys in Chatham and Clarence Strait. These surveys provide estimates of CPUE, relative abundance, and biological data. In addition, tagging studies exist to study sablefish movement for federal, state, and Canadian waters.

The ADFG conducts an annual tagging survey in Chatham Strait as part of a mark-recapture study to estimate population abundance. The mark-recapture data is used to determine an annual relative abundance index and to understand movement dynamics (Heifetz and Maloney, 2001). The Auke Bay Laboratory continued the 40+ year time series of sablefish tagging in 2021. Approximately 6,155 sablefish were tagged on the annual NMFS longline survey. Approximately 270 sablefish tags have been recovered in 2021 to date. Of those recovered tags, the longest time at liberty was a little over 41 years (15,110 days), the shortest recovered tag at liberty was for 35 days, and the greatest distance traveled was 2,357 nautical miles from a fish tagged in the Northwest Aleutian Islands on 5/25/1982 and recovered off the Oregon coast on 4/19/2021.

The assessment document includes extensive treatment of Ecosystem and Socioeconomic Profile and the evaluation of trawl removals of small sablefish in the Bering Sea have both been updated with new data for 2021. Biological characteristics describing updates to weight and growth, maturity, model updates and new parametrizations, and a description of the final proposed model updates and the full factorial model building exercise are included. In addition to the annual stock assessment and its related/supporting work, extensive research is ongoing Alaskan waters which have relevance for the sablefish stock and Alaskan ecosystems.

This work includes:
North Pacific Research Board (NPRB), the Bering Sea Integrated Ecosystem Research Program, The Gulf of Alaska Integrated Ecosystem Research Project (IERP), The Alaska Climate Integrated Modelling (ACLIM), and The North Pacific Marine Science Organization (PISCES),.

As part of IPHC's annual setline survey, which provides data for the sablefish assessment, IPHC conducts an extensive oceanographic monitoring program which includes waters off British Columbia, and into the Gulf of Alaska, Bering Sea, and Aleutian Islands. The IPHC is collaborating with the Joint Institute for the Study of the Atmosphere and Ocean (JISAO) at the University of Washington and NOAA's Pacific Marine Environmental Laboratory to process the oceanographic data and make them publicly accessible, and a number of years of data up to 2014 are currently available.

Also, the Pacific States Marine Fisheries Commission coordinates research activities, monitors fishing activities, collects and maintains databases on marine fish occurring off the California, Oregon, Washington, and Alaska coasts.

Another major ecosystem research report is the AFSC Ecosystem Consideration Report series (3). The Ecosystem Considerations 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 2018, 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 assessments, and ecosystem-based management indicators that together provide context for ecosystem-based fisheries management in Alaska. In an ecosystem context, NOAA's Alaska Fisheries Science Center produces annual "Alaska Marine Ecosystem Status Reports" which describe oceanographic and productivity characteristics of the Eastern Bearing Sea, Aleutian Islands, and Gulf of Alaska.

For the Eastern Bering Sea they report that along with much of the North Pacific, the eastern Bering Sea has remained in an extended warm phase since approximately 2014. Satellite observations of sea surface temperatures (SSTs) in both the northern and southern Bering Sea have remained higher than the average from 1985-2014. However, after the extremely warm years of 2018 and 2019, conditions in 2020 and 2021 subsided to 1°C above average. The extended warm phase also impacts sea ice formation and extent. Water temperature and winds play key roles in the annual development and retreat of sea ice.

5.2.	There shall be 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.

For the Aleutian Islands they report that sea surface temperatures during August and September 2021 in the western and central Aleutians were the highest since the satellite record began in 2003. In the eastern Aleutians, temperatures were mostly cooler relative to last year and closer to the long- term average. Low sea level pressure caused a stormier winter than usual. This was followed by westerly winds in spring, which suppressed transport through eastern passes. Slightly stormier conditions returned in summer in the western and central Aleutians. In general, environmental conditions were near average over much of the year, continuing the largely more favorable conditions for the biota in 2020 relative to recent years. Overall, sea surface temperatures are expected to decrease to average levels through winter 2021 and early spring 2022. Both planktivorous and piscivorous seabirds had reproductive success above the long-term average, suggesting wide availability of prey. The abundance of Eastern Kamchatka pink salmon was the second highest on record. This may be expected to have ecosystem impacts, as increased competition for prey and trophic cascades have been shown in years of high abundance of pink salmon.

Lastly, paralytic shellfish toxins were reported to be 75x above the regulatory limit in Unalaska. This continues to pose a risk to human health and food webs in the region. And for the Gulf of Alaska, they report that the area is in its second consecutive non-marine heatwave year, with average ocean temperatures at surface and depth. There are mixed trends in prey abundance and reduced abundance of groundfish apex predators (Pacific cod, Arrowtooth flounder, Pacific halibut). They speculate that the biological community experiencing continued impacts from the 2014-2016 and 2019 marine heatwave periods.

In 2016, NPFMC appointed 12 people to a Plan Team to begin developing the Council's Bering Sea Fishery Ecosystem Plan (FEP). The Team's primary responsibilities were to develop the core FEP document, to discuss potential and ongoing FEP action modules, make recommendations to the Ecosystem Committee and the Council about future steps, and to help communicate results to the Council. While the team is a scientific and technical team, the focus is also to ensure that FEP action modules interface with the Council's management needs and can be integrated into the Council's decision making and management process.

In December 2018 NPFMC adopted the Bering Sea Fishery Ecosystem Plan (FEP)(4). The BSFEP document identifies management goals and objectives for the FEP and for monitoring of the Bering Sea ecosystem and describes how the FEP framework will support research projects (Action Modules) to address Council priorities. The Council also adopted the five action modules included in the draft, and initiated action on two of them. For year 2019, NPFMC staff will work with the BS FEP Team to bring back workplans for how to manage the workload associated with the initiated modules. The two action modules for the Council to work on are:

- Develop protocols for using Local Knowledge and Traditional Knowledge in management and understanding impacts of Council decisions on subsistence use.
- Evaluate the short- and long-term effects of climate change on fish and fisheries.

Regarding socio-economic data collection, AFSC's Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska. This comprehensive report (Fissel, *et al*., 2018) (5) provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC discards rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, and relates changes in value, price, and quantity, across species, product, and gear types, to changes in the market. This report includes extensive economic data for the commercial sablefish fishery.

Various studies have been conducted on the economic value of sportfishing in Alaska which include sablefish, although sablefish is not a major target species for sport fishing. The Alaska Seafood Marketing Institute has contracted studies to determine the value of Alaska's seafood industry, and the University of Alaska, Institute of Social and Economic Research conducts research on the economics of various Alaskan fisheries.

Since 2002 IPHC has been working cooperatively with the Alaska Department of Environmental Conservation (ADEC) in a project monitoring environmental contaminants in Alaskan fish. The fish being studied include sablefish, and these are analyzed for

5.2.	**There shall be 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.**

organochlorine pesticides, dioxins, furans, polybrominated diphenyl ethers, PCB congeners, methyl mercury and heavy metals (arsenic, selenium, lead, cadmium, nickel, and chromium).

The Oil Spill Recovery Institute (OSRI)(6) was established by US Congress in response to the 1989 Exxon Valdez oil spill. OSRI is administered through and housed at the Prince William Sound Science Center, a non-profit research and education organization located in Cordova, AK. The PWS Science Center facilitates and encourages ecosystem studies in the Greater Prince William Sound region. OSRI produces an annual report (7), among other publications. The 2017 report contains details on their activities, including ongoing research projects, an update of field guide for oil spill response in arctic waters, and shore-zone mapping of the eastern Aleutian Islands.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
Data collected by scientific surveys and Alaska Pacific Sablefish and Pacific Halibut fisheries and ecosystems are analysed are described extensively above. Results of these analyses are disseminated in a timely fashion through numerous methods, including scientific publications, and as information on NMFS, ADFG, IPHC, and NPFMC websites.

Evidence Basis: *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.*	☑

EVIDENCE:
Data collected by scientific surveys and Alaska Pacific Sablefish and Pacific Halibut fisheries and ecosystems are analysed are described extensively above. Results of these analyses are disseminated in a timely fashion through numerous methods, including scientific publications, and as information on NMFS, ADFG, IPHC, and NPFMC websites.

References:

1. Discard mortality rates and post-release survival in the directed Pacific halibut fishery PREPARED BY: IPHC SECRETARIAT (C. DYKSTRA, 26 JANUARY 2018)
2. Tracee O. Geernaert. Trends in seabird occurrence on stock assessment surveys (2002-2011). IPHC REPORT OF ASSESSMENT AND RESEARCH ACTIVITIES 2011
3. Website of the Ecosystem Status Reports For The Gulf Of Alaska, Bering Sea And Aleutian Islands. https://www.fisheries.noaa.gov/alaska/ecosystems/ecosystem-status-reports-gulf-alaska-bering-sea-and-aleutian-islands
4. Website of the Bering Sea Integrated Ecosystem Research Program, https://data.eol.ucar.edu/project/BSIERP
5. STOCK ASSESSMENT AND FISHERY EVALUATION REPORT FOR THE GROUNDFISH FISHERIES OF THE GULF OF ALASKA AND BERING SEA/ALEUTIAN ISLANDS AREA: ECONOMIC STATUS OF THE GROUNDFISH FISHERIES OFF ALASKA, 2019. Ben Fissel, Michael Dalton, Brian Garber-Yonts, Alan Haynie, Stephen Kasperski, Jean Lee, Dan Lew, Chang Seung, Kim Sparks, Marysia Szymkowiak, Sarah Wise.2021. Economic and Social Sciences Research Program Resource Ecology and Fisheries Management Division Alaska Fisheries Science Center.
6. Website for the Oil Spill Recovery Institute (OSRI), https://osri.us/.
7. OSRI Fiscal Year 2021 Annual Report, https://osri.us/resources/docs/

Numerical score:	Starting score	– (	Number of EPs NOT met	x 3)	=	Overall score
	10		0			10
Corresponding Confidence Rating:						High

5.2.	There shall be 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.	
(10 = High; 4 or 7 = Medium; 1 = Low)		
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)		Full Conformance
Non-conformance Number (if applicable):		

9.3.2.5 Supporting Clause 5.3.

5.3	Management organizations shall cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *There is cooperation or interaction between international organizations to ensure optimum utilization of resource.*	☑

EVIDENCE:

Pacific Halibut

IPHC is, by definition, an international organization. It was established in 1923 and has a mission for the preservation of the Pacific Halibut fishery in waters off Canada and the United States of America. There is extensive cooperation on various aspects of research, stock assessment, and management of Pacific Halibut between the fisheries agencies (e.g., DFO and NMFS) of these two nations. Declaration of the 200- mile EEZ's by both countries in the late 1970's drastically reduced and eventually eliminated halibut fishing in these waters by countries other than Canada and USA.

There are cooperative research and surveys carried out on the stock involving other nations (nations other than Canada and the United States), but these are limited. This includes the 1984 US-Japan bottom trawl survey in the GOA (Brown 1986). Pacific Halibut caught in Russian areas of the Bering Seas are believed to be of a different stock, and this information is not considered in the annual IPHC assessments. There is ongoing contact between IPHC and Russian scientists regarding halibut research in the Bering Sea area (I. Stewart, pers. com).

A major international effort for the monitoring of halibut stock is The Fishery-Independent Setline Survey (FISS) conducted by. The FISS provides catch information and biological data on Pacific halibut that are independent of the fishery.

The most recent FISS covers the majority of Pacific halibut fishing grounds within the IPHC Convention Area with a 10 by 10 nautical mile grid of stations ranging from California to the northern Bering Sea including the Aleutian Islands. The FISS often includes an expanded number of stations in IPHC Regulatory Areas to gather additional data. This is part of a multi-year FISS expansion effort into depths and locations beyond the standard FISS stations but where Pacific halibut may be located.

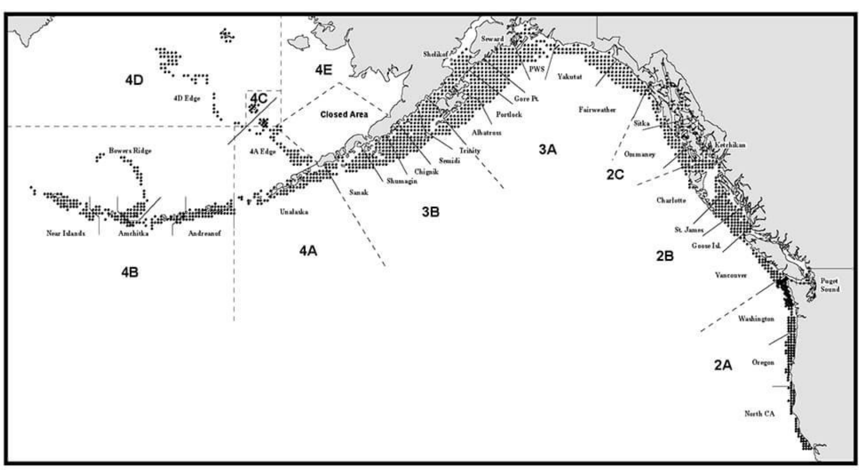

Figure 16. Study area and statistical strata for the FISS survey. Details of the survey are found in the sampling manual (2).

There is considerable discussion and exchange between IPHC and NPFMC on management issues related to Alaska Pacific Halibut. Currently, both organizations are cooperating to develop a Halibut Management Framework (1), designed to improve coordination between the Council and IPHC. One goal is for better alignment of the two management bodies when dealing with needs among the various directed fishery and bycatch user groups.

5.3	**Management organizations shall cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.**

Alaska Pacific Sablefish

The only two nations involved in the sablefish fishery in the eastern North Pacific are Canada and the United States. The resources in each nation's waters are managed separately, and each nation conducts surveys that occur in adjacent geographical areas, as well as a survey conducted by IPHC that covers areas in the EEZs of both countries. Japan and USA conducted cooperative longline surveys from 1978 to 1994, these data are used in the current stock assessment as an index of abundance. There is strong and consistent cooperation on various aspects of research, stock assessment, and management between the fisheries agencies (e.g., DFO and NMFS) of USA and Canada (3).

The 2022 Alaska Pacific Sablefish assessment (3) documents the concurrent sablefish trends seen in Alaska, Canada, and the West Coast and highlights the need to better understand the contribution to Alaska sablefish productivity from other areas. A Pacific Sablefish Transboundary Assessment Team (PSTAT) consisting of scientists from the U.S. (west coast and Alaska regions, including both federal and state scientists) and Canada has been working to better understand the dynamics, population trends, and biology of sablefish across the eastern Pacific Ocean (4). The group is developing spatially explicit tagging analyses and operating models to estimate connectivity among regions and eventually explore impacts of regional management measures on the coast wide population through management strategy evaluation (MSE). Additionally, age reading groups across agencies have addressed sablefish ageing discrepancies by developing standardized ageing criteria through the Committee of Age Reading Experts (CARE) group.

Current status/Appropriateness/Effectiveness: *There is evidence available to substantiate that such cooperation or interaction has taken place. There is data available that substantiates cooperation activities.*	☑

EVIDENCE:

Evidence presented in each of the two stock assessments and publicly available information from the research and management bodies substantiate the cooperation and interaction of international organizations.

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that management organizations cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. Examples may include outputs resulting from meetings or other research.*	☑

EVIDENCE:

The evidence is sufficient to substantiate cooperation and interaction of international organizations. This evidence is documented in the cited documents and described above.

References:

1. Halibut Management Framework, Report form NPFMC meetings. https://meetings.npfmc.org/CommentReview/DownloadFile?p=68d181e8-814a-45c4-924b-2651766c4c84.pdf&fileName=Management%20Framework.pdf
2. International Pacific Halibut Commission Fishery-Independent Setline Survey Sampling Manual (2021). https://iphc.int/uploads/pdf/manuals/2021/iphc-2021-vsm01.pdf
3. 2022 Assessment Of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2022-assessment-sablefish-stock-alaska
4. Fenske *et al*., 2019; https://www.pacificsablefishscience.org/

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):	

9.3.2.6 Supporting Clause 5.4.

5.4.	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.

Relevance:	Relevant **Note:** Not applicable if stock is not transboundary , shared, straddling, highly migratory or high seas in nature.

Evaluation Parameters	Met?
Process: *The collaborative technical and research programs to improve understanding of the biology, environment, and status of transboundary aquatic stocks have been developed.*	☑

EVIDENCE:

Pacific Halibut

The transboundary issues for the Alaskan Pacific Halibut stock are between Canada and USA, and these are dealt with in the IPHC. Both countries have extensive scientific programs for halibut research and assessment and collaborate on research to promote sustainable management. Evidence for this is contained in the IPHC Scientific and Technical reports (1).

Alaska Pacific Sablefish

The main transboundary issues for the Alaskan sablefish stock are between Canada and USA. Both countries have extensive scientific programs for research and assessment and collaborate on numerous topics related to sablefish science and management. Data from the DFO sablefish surveys in B.C. waters are considered in the NMFS/NPFMC assessment process and SAFE document (1). The similarly low abundance (through 2014) south of Alaska is of concern, and points to the need to better understand the contribution to Alaska sablefish productivity from B.C. sablefish. Some potential ideas which have been discussed are to conduct an area-wide study of sablefish tag recoveries, and to attempt to model the population to include B.C. sablefish and U.S. West Coast sablefish. Recent data from Canadian surveys in BC waters have shown an increase in sablefish abundance and biomass (Figure 17) and reported in the most recent stock assessment (3).

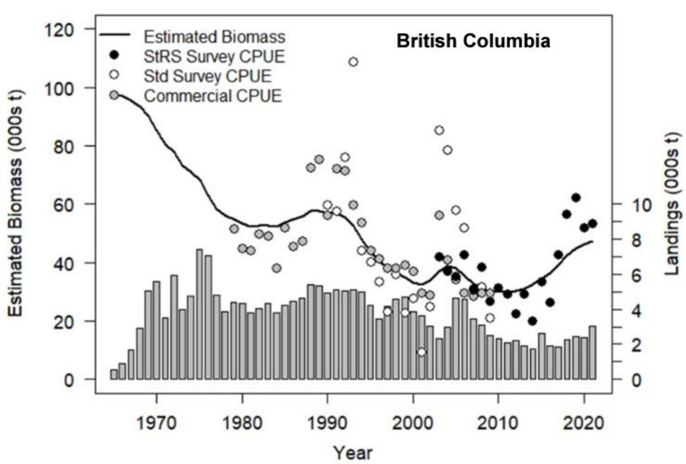

Figure 17. Observed landings, commercial CPUE, and survey CPUE, as well as estimated biomass from a surplus production model of British Columbia sablefish.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

5.4.	**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.**
Evidence presented in each of the two stock assessments and publicly available information from the research and management bodies that substantiate the efforts to improve understanding of transboundary stock issues.	
Evidence Basis: *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.*	☑
EVIDENCE: The quality, availability and adequacy of the evidence is sufficient in each of the two stock assessments and publicly available information. These sources of evidence show that the research and management bodies make appropriate efforts to improve understanding of transboundary stock issues.	
References:	1. IPHC Documents website portal. https://iphc.int/library/documents/category/scientific-reports 2. International Pacific Halibut Commission Fishery-Independent Setline Survey Sampling Manual (2021). https://iphc.int/uploads/pdf/manuals/2021/iphc-2021-vsm01.pdf 3. 2022 Assessment Of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2022-assessment-sablefish-stock-alaska

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):	

9.3.2.7 Supporting Clause 5.5.

5.5.	**Data generated by research shall be analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *There is a process that allows analysis of research data, ensuring, where appropriate, their confidentiality.*		☑
EVIDENCE: Data, summarized in reports and executive summaries, are made widely available throughout the assessment process and enable timely resource management, such as quota setting, through the agency websites, publications, and at various public meetings. Data on certain aspects of commercial fishing are confidential, such as individuals or individual vessels in the analysis of fishery CPUE data, depending on the number of individuals or entities involved (1). Data of this nature for both fisheries under consideration are confidential as defined by Alaska statutes (AS 16.05.815 and 16.40.155). These laws are concerned with confidential nature of certain reports and records.		
Current status/Appropriateness/Effectiveness: *There is evidence data was properly analyzed. Data was published respecting, where appropriate, confidentiality agreements. The rules of confidentiality are effectively respected.*		☑
EVIDENCE: There is evidence that all rules of confidentiality are effectively respected: As described above, both fisheries under examination, have a regional structure (state agency and the IPHC) that distributes data following all confidentiality requirements. When data can be traced back to a single trip or a single harvester, data are pooled for presentation purposes. If the fishery participants are unknown, there must be at least 3 records included for data summaries to be considered non-confidential "Rule of 3". Once an individual has access to the confidential queries, their access and the results of their queries are limited to the program partners with approved access.		
Evidence Basis: *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.*		☑
EVIDENCE: As described above, both fisheries under examination, have a regional structure (state agency and the IPHC) that distributes data following all confidentiality requirements.		
References:	1. NAO 216-100: Protection of Confidential Fisheries Statistics. https://www.noaa.gov/organization/administration/nao-216-100-protection-of-confidential-fisheries-statistics.	

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):	

9.3.3 Fundamental Clause 6. Biological reference points and harvest control rule

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.

9.3.3.1 Supporting Clause 6.1.

6.1.	**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 adverse impacts on dependent predators.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

Pacific Halibut

Full, age-structured, statistical stock assessments are conducted annually, and fisheries management and conservation are based on precautionary and ecosystem-based approaches, including the use of reference points for spawning biomass and harvest rate (1). Since 1985, the IPHC has followed a constant harvest rate policy to determine annual available yield, termed the Constant Exploitation Yield (CEY). A biological target level for total removals from each regulatory area is calculated yearly by applying a fixed area-specific harvest rate to the estimate of exploitable biomass in each IPHC regulatory area. The apportionment percentages and the target harvest rates for each regulatory area together result in a target distribution for the annual TCEY. The scale of this distribution is based on the estimate of the coastwide exploitable biomass at the beginning of year *t*+1 from the stock assessment in year *t*.

The IPHC's interim management procedure uses a relative spawning biomass of 30% as a fishery trigger, reducing the reference fishing intensity if relative spawning biomass decreases further toward a limit reference point at 20%, where directed fishing is halted due to the critically low biomass condition. The relative spawning biomass at the beginning of 2022 was estimated to be 33% (credible interval: 22-54%), the same value estimated for 2021. The probability that the stock is below $SB_{30\%}$ *is* estimated to be 45% at the beginning of 2022, with less than a 1% chance that the stock is below $SB_{20\%}$. The IPHC's current interim management procedure specifies a target level of fishing intensity of a Spawning Potential Ratio (SPR) corresponding to an $F_{43\%}$; this equates to the level of fishing that would reduce the lifetime spawning output per recruit to 43% of the unfished level given current biology, fishery characteristics and demographics. Based on the 2021 assessment, the 2021 fishing intensity is estimated to correspond to an $F_{46\%}$ (credible interval: 35-63%). Stock projections were conducted using the integrated results from the stock assessment ensemble, details of IPHC Regulatory Area-specific catch sharing plans and estimates of mortality from the 2021 directed fisheries and other sources of mortality. The projections for this assessment are more optimistic than those from the 2019 and 2020 assessments due largely to the increasing projected maturity of the 2012 year- class. This translates to a lower probability of stock decline for 2022 than in recent assessments as well as a decrease in this probability through 2023-24. There is greater than a 50% probability of stock decline in 2023 (55- 64/100) for the entire range of SPR values from 40-46%, which include the *status quo* TCEY and the $F_{43\%}$ reference level. The 2022 "3-year surplus" alternative, corresponds to a TCEY of 38.0 million pounds (~17,240 t), and a projected SPR of 48% (credible interval 32-63%). At the reference level (a projected SPR of 43%), the probability of spawning biomass'declines from 2022 to 2023 is 59%, decreasing to 55% in three years, as the 2012 cohort matures. The one-year risk of the stock dropping below $SB_{30\%}$ ranges from 43% at the $F_{46\%}$ level to 45% at the at the $F_{40\%}$ level of fishing intensity.

Alaska Pacific Sablefish

Sablefish are managed under Tier 3 of NPFMC harvest control rules (2). The updated point estimate of $B_{40\%}$, is 118,140 t. Since projected female spawning biomass (combined areas) for 2022 is 128,789 t (equivalent to B44%), sablefish is in sub-tier "a" of Tier 3. Spawning biomass is projected to continue to increase rapidly in the near-term, reaching $B_{44\%}$ in 2022 and B51% in 2023. The updated

6.1.	**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 adverse impacts on dependent predators.**

point estimates of $F_{40\%}$ and $F_{35\%}$ from this assessment are 0.080 and 0.094, respectively. Thus, the maximum permissible value of FABC under Tier 3a is 0.080, which translates into a 2022 maximum permissible ABC (combined areas) of 34,863 t. The OFL fishing mortality rate is 0.094, which translates into a 2022 OFL (combined areas) of 40,432 t. Thus, current model projections indicate that the Alaskan sablefish stock is not undergoing overfishing, not overfished, and not approaching an overfished condition. The stock assessment author recommended ABC for 2022 is Tier 3a maximum permissible ABC of 34,863 t. The final whale-adjusted 2022 ABC is 34,521 t.

From the 2021 stock assessment:
Given the large quantities of data, the high quality of data, and general agreement in recent population trends in the sablefish abundance indices, there were no major concerns about the data used in the sablefish assessment. Similarly, there were no major retrospective patterns or other diagnostic issues with the proposed assessment model (21.12_Proposed_No_Skip_Spawn). As such, the assessment considerations category for sablefish was rated '1 – Normal'. Although minor uncertainty in the exact magnitude of recent recruitment events exists, there are now enough observations of these cohorts to validate estimates of multiple large recent cohorts. Evidence is also mounting that the 2016 recruitment is likely the largest on record. However, sablefish age structure is severely truncated with information content mainly from ages 1-20. and the SSB relies heavily on these recent cohorts with little contribution from early 2000s-year classes. Thus, the population dynamics category was rated '2 – Increased Concern'.

Overall, environmental and ecosystem indicators suggest stable temperatures at depth, moderate to warm surface temperature conditions, a mix of average to below average indicators of foraging conditions, no apparent increases in predation pressure, and reduction in potential competition due to juvenile sablefish moving off the shelf and into adult slope habitat thus overall showing no apparent large changes to sablefish environmental conditions.

Given that no major concerns are apparent for sablefish, the environmental and ecosystem category was rated '1 – Normal'. In recent years, there has been a rapid shift in the composition of the fixed gear fleet where pot gear now constitutes more than 50% of sablefish removals, which is not fully accounted for in the assessment thus adding some uncertainty to information content from this gear category. In addition, the rapid decline in overall market conditions, particularly due to the influx of small sablefish, may be contributing to differences in targeting and selectivity in all fisheries. Therefore, the fishery performance category was rated '2 – Increased Concern'.

Given the lack of major concerns for sablefish along with improved model performance of the proposed assessment model, no additional reductions in ABC are being recommended (though deductions for whale depredation are still incorporated). However, a few additional considerations are worth noting for future sablefish management.

First, the projected maximum ABC would represent the largest catch since the late 1980s, which, due to high catches and extended periods of poor recruitment, was followed by subsequent declines in biomass and SSB. Similarly, given concerns regarding the contracted age structure, the abundance of older ages in the population should continue to be closely monitored. Alternate metrics of spawning potential, which better emphasize fully mature age classes (e.g., the biomass of ages > 10), could help maintain a strong spawning portfolio through inclusion of age classes perhaps more indicative of stock health and avoid future contraction of the age structure, thereby improving resilience of the sablefish resource (Hixon *et al.*, 2014; Lowerre- Barbieri *et al.*, 2016; Licandeo *et al.*, 2020). Similarly, given that sablefish are such a long-lived species along with the cyclic nature of sablefish dynamics, exploration of a capped (i.e., implementing a maximum cap on the ABC) management procedure (or an 'inventory management' strategy) for sablefish may be worthwhile for consideration in the MSE. Compared to using a maximum yearly catch strategy, capped HCRs could aid in stabilizing long-term sablefish dynamics (i.e., help to prevent long-term cyclical declines as the resource transitions between high and low recruitment regimes (Licandeo *et al.*, 2020).

For state-managed sablefish fisheries, the Cook Inlet, Prince William Sound, and the Aleutian Islands state fisheries have guideline harvest limits (GHL) and are managed using NMFS assessment data (and therefore federal reference points), historical catches and effort, projected catch and effort, and a yield-per- unit-area model, among other parameters.

6.1.	**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 adverse impacts on dependent predators.**

The 2021 Southern Southeast Inside (SSEI) Sub-district sablefish commercial annual harvest objective (AHO) is 601,271 round pounds, a 5% increase from the 2020 AHO. Equal quota share (EQS) for each of the 22 permit holders will be 27,330 round pounds. The 2021 Northern Southeast Inside (NSEI) Sub-district commercial sablefish fishery annual harvest objective (AHO) is 1,136,685 round pounds. There are 75 valid Commercial Fisheries Entry Commission (CFEC) permits for 2021, which is the same number of permits as in 2020 (3). The individual equal quota share (EQS) is 15,156 round pounds, a 2.6% increase from the 2020 EQS of 14,773 round pounds. Although there is not a full suite of agreed reference points for these state-managed sablefish resources, the fisheries continue to be well managed, with recent catches often being less than the specified GHLs.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
For both stocks under consideration the 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. These have been tested in simulation and peer-reviewed and are consistent with international standards.

Evidence Basis: *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.*	☑

EVIDENCE:
For both stocks under consideration the 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. These have been tested in simulation and peer-reviewed and are consistent with international standards. Please see supported evidence on references.

References:

1. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022).
2. 2021 Assessment Of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska
3. Website of the Alaska Department of Fish and Game, https://www.adfg.alaska.gov/

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:									Full Conformance

6.1.	**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 adverse impacts on dependent predators.**

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

9.3.3.2 Supporting Clause 6.2.

6.2.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

For both stocks under consideration, limit reference points are consistent with avoiding overfishing. These have been tested in simulation and peer-reviewed and are consistent with international standards.

Pacific Halibut

The IPHC's interim management procedure uses a relative spawning biomass of 30% as a fishery trigger, reducing the reference fishing intensity if relative spawning biomass decreases further toward a limit reference point at 20%, where directed fishing is halted due to the critically low biomass condition (1). The relative spawning biomass at the beginning of 2022 was estimated to be 33% (credible interval: 22-54%), the same value estimate for 2021. The probability that the stock is below $SB_{30\%}$ *is* estimated to be 45% at the beginning of 2022, with less than a 1% chance that the stock is below $SB_{20\%}$. The IPHC's current interim management procedure specifies a target level of fishing intensity of a Spawning Potential Ratio (SPR) corresponding to an $F_{43\%}$; this equates to the level of fishing that would reduce the lifetime spawning output per recruit to 43% of the unfished level given current biology, fishery characteristics and demographics. Based on the 2021 assessment, the 2021 fishing intensity is estimated to correspond to an $F_{46\%}$ (credible interval: 35-63%). Stock projections were conducted using the integrated results from the stock assessment ensemble, details of IPHC Regulatory Area- specific catch sharing plans and estimates of mortality from the 2021 directed fisheries and other sources of mortality. The projections for this assessment are more optimistic than those from the 2019 and 2020 assessments due largely to the increasing projected maturity of the 2012 year- class. This translates to a lower probability of stock decline for 2022 than in recent assessments as well as a decrease in this probability through 2023-24. There is greater than a 50% probability of stock decline in 2023 (55- 64/100) for the entire range of SPR values from 40-46%, which include the *status quo* TCEY and the $F_{43\%}$ reference level. The 2022 "3-year surplus" alternative, corresponds to a TCEY of 38.0 million pounds (~17,240 t), and a projected SPR of 48% (credible interval 32-63%). At the reference level (a projected SPR of 43%), the probability of spawning biomass'declines from 2022 to 2023 is 59%, decreasing to 55% in three years, as the 2012 cohort matures. The one-year risk of the stock dropping below $SB_{30\%}$ ranges from 43% at the $F_{46\%}$ level to 45% at the at the $F_{40\%}$ level of fishing intensity.

Alaska Pacific Sablefish

Sablefish are managed under Tier 3 of NPFMC harvest control rules (2). The updated point estimate of B40%, is 118,140 t. Since projected female spawning biomass (combined areas) for 2022 is 128,789 t (equivalent to B44%), sablefish is in sub-tier "a" of Tier 3. Spawning biomass is projected to continue to increase rapidly in the near-term (Figure 3.48), reaching B44% in 2022 and B51% in 2023. The updated point estimates of F40% and F35% from this assessment are 0.080 and 0.094, respectively. Thus, the maximum permissible value of FABC under Tier 3a is 0.080, which translates into a 2022 maximum permissible ABC (combined areas) of 34,863 t. The OFL fishing mortality rate is 0.094, which translates into a 2022 OFL (combined areas) of 40,432 t. Thus, current model projections indicate that the Alaskan sablefish stock is not subject to overfishing, not overfished, and not approaching an overfished condition.

Current status/Appropriateness/Effectiveness: *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*	☑

6.2.	**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.**

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.*	

EVIDENCE:
For both stocks under consideration, limit reference points are consistent with avoiding overfishing. These have been tested in simulation and peer-reviewed and are consistent with international standards.

Evidence Basis: *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.*	☑

EVIDENCE:
For both stocks under consideration, limit reference points are consistent with avoiding overfishing. These have been tested in simulation and peer-reviewed and are consistent with international standards. Please see supported evidence on references.

References:	1. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022). 2. 2021 Assessment Of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska

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):	

9.3.3.3 Supporting Clause 6.3.

6.3.	**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).**
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑

EVIDENCE:

Pacific Halibut

The IPHC's interim management procedure uses a relative spawning biomass of 30% as a fishery trigger, reducing the reference fishing intensity if relative spawning biomass decreases further toward a limit reference point at 20%, where directed fishing is halted due to the critically low biomass condition (1). The relative spawning biomass at the beginning of 2022 was estimated to be 33% (credible interval: 22-54%), the same value estimate for 2021. The probability that the stock is below $SB_{30\%}$ is estimated to be 45% at the beginning of 2022, with less than a 1% chance that the stock is below $SB_{20\%}$. The IPHC's current interim management procedure specifies a target level of fishing intensity of a Spawning Potential Ratio (SPR) corresponding to an $F_{43\%}$; this equates to the level of fishing that would reduce the lifetime spawning output per recruit to 43% of the unfished level given current biology, fishery characteristics and demographics. Based on the 2021 assessment, the 2021 fishing intensity is estimated to correspond to an *F46%* (credible interval: 35-63%). Stock projections were conducted using the integrated results from the stock assessment ensemble, details of IPHC Regulatory Area- specific catch sharing plans and estimates of mortality from the 2021 directed fisheries and other sources of mortality. The projections for this assessment are more optimistic than those from the 2019 and 2020 assessments due largely to the increasing projected maturity of the 2012 year- class. This translates to a lower probability of stock decline for 2022 than in recent assessments as well as a decrease in this probability through 2023-24. There is greater than a 50% probability of stock decline in 2023 (55- 64/100) for the entire range of SPR values from 40-46%, which include the *status quo* TCEY and the *F43%* reference level. The 2022 "3-year surplus" alternative, corresponds to a TCEY of 38.0 million pounds (~17,240 t), and a projected SPR of 48% (credible interval 32-63%). At the reference level (a projected SPR of 43%), the probability of spawning biomass'declines from 2022 to 2023 is 59%, decreasing to 55% in three years, as the 2012 cohort matures. The one-year risk of the stock dropping below $SB_{30\%}$ ranges from 43% at the $F_{46\%}$ level to 45% at the at the $F_{40\%}$ level of fishing intensity.

Alaska Pacific Sablefish

The stock is managed using a Tier system, based on knowledge and uncertainties of the stock in question (the quality of the data, precision in the model) (2). Sablefish harvest specifications are made annually by NPFMC, and include the Overfishing Level (OFL), acceptable biological catch (ABC), and total allowable catch (TAC). TACs are generally set more conservatively than ABCs, which in turn are generally set more conservatively than OFLs. Since OFLs are consistent with MSY and catches are generally within TAC levels, harvests tend to always be at the conservative side of MSY. As can be seen below, recent catches of Alaska sablefish have been well within recommendations, indicating that the harvest control rules continue to work well and within precautionary set limits. Reference points were calculated using the average year class strength from 1977 - 2017. The updated point estimate of B40%, is 118,140 t. Since projected female spawning biomass (combined areas) for 2022 is 127,789 t (9% higher than B40%, or equivalent to B44%), sablefish is in sub-tier "a" of Tier 3. The updated point estimates of F40%, and F35% from this assessment are 0.080 and 0.094, respectively. Thus, the maximum permissible value of FABC under Tier 3a is 0.080, which translates into a 2022 ABC (combined areas) of 34,863 t. The adjusted OFL fishing mortality rate is 0.094, which translates into a 2022 OFL (combined areas) of 40,432 t. **Current model projections indicate that this stock is not subject to overfishing, not overfished, and not approaching an overfished condition.**

State of Alaska Survey:

6.3.	**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).**

In 2021, sablefish longline surveys were conducted for both the Northern Southeast Inside (NSEI) and Southern Southeast Inside (SSEI) areas (3). These surveys are designed to measure trends in relative abundance and biological characteristics of the sablefish population. In addition to longline surveys, a mark-recapture survey is conducted using longlined pots in most years since 2000. This survey has used the state research vessel Medeia since 2012 (3). A survey was not completed in 2021 due to budgetary constraints, but the survey will occur in May 2022. The mark-recapture results serve as a component of the NSEI stock.

In Central Region, ADF&G conducted longline surveys for sablefish from 1996 through 2006 in PWS. Longline survey effort was extended into the North Gulf District in 1999, 2000 and 2002. All longline surveys were discontinued due to lack of funding, and with the goal of transitioning to a pot longline survey, particularly in PWS. Between 1999 and 2005, sablefish were opportunistically tagged in PWS on ADF&G trawl surveys (4).

Sablefish tagging surveys were conducted in PWS in 2011, 2013, and 2015 using pot longline gear. There were 1,203 fish, 318 fish, and 26 fish tagged in 2011, 2013, and 2015, respectively. CPUE was very low in 2013 with an average of 0.11 fish per pot. To date, 349 fish have been recaptured from the 2011 survey and 63 were captured from the 2013 survey and 10 from the 2015 survey. Of all tagged releases, 52% have been recaptured within PWS and 43% outside in the GOA with the remainder of unknown location. There have been no PWS sablefish tagging surveys since 2015. Sablefish are captured in Central Region Tanner crab bottom trawl surveys.

A population biomass index from the PWS and Cook Inlet bottom trawl surveys is generated each year of those surveys with the catch composed of predominantly 1 and 4-yr old fish (see Skate – Research section above for more information on these surveys). PWS trawl surveys were not conducted in 2020–2021. The historical survey area will again be surveyed annually beginning in 2022. No Cook Inlet surveys have been conducted since 2019 and it is uncertain when that survey will resume.

In Central Region, skipper interviews and biological sampling in 2021 occurred in Whittier, Seward, and Cordova (4). Data collected included date and location of harvest, length, weight, sex, gonad condition, and otoliths. Otoliths were sent to the Age Determination Unit. Logbooks are required in both fisheries to provide catch and effort data by date and location (Contact Elisa Russ). The Division of Sport Fish—Southeast Region collects catch, harvest, and biological data from sablefish as part of a marine harvest survey program. Ports sampled in 2021 included Juneau, Sitka, Craig, Petersburg/Wrangell, Gustavus, Yakutat, and Ketchikan. Length data were collected from 469 sablefish in 2021, primarily from the ports of Sitka, Ketchikan, and Juneau.

The Age Determination Unit worked with the AFSC, Auke Bay Laboratories to investigate the use of age-0 lapillar and sagittal otoliths to infer daily growth in juvenile sablefish in the Gulf of Alaska. Otoliths from rhinoceros auklet bill-load samples from 1978 to present, survey samples, and samples from laboratory reared juvenile sablefish were removed and prepared. The external and internal structure of otoliths collected from bill-load samples were significantly damaged due to storage and were not useful for modelling size nor daily growth. Focus was shifted to samples included in growth trials conducted at Auke Bay Laboratories. Otolith size and daily increment width was measured using image analysis. The relationships between lapillar and sagittal otolith increment width, comparison of total increment count on both structures, otolith size to fish size, temperature and feeding ration were modeled. Evaluations of survey and laboratory reared juvenile sablefish found close agreement in daily age between otoliths, strong linear relationships between otolith size and fish size, and peak otolith increment width in both structures between 14°C and 18°C and at maximum feed rations. These findings support current and previous studies, and investigators plan to publish methods and findings.

State of Alaska Assessment

In the Southeast Region, the department uses mark-recapture methods with external tags and fin clips to estimate abundance and exploitation rates for sablefish in the NSEI Subdistrict. Sablefish are captured with pot gear in May or June, marked with a tag and a fin clip then released. Tags are recovered from the fishery and fish are counted at the processing plants and observed for fin clips. In addition to the mark-recapture work, an annual longline survey is conducted in NSEI to provide biological data as well as relative

6.3.	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).

abundance information. In the NSEI Subdistrict, the 2021 recommended ABC was 569.3 mt, a 3.1% increase from the 2020 ABC (4). The ABC was generated using a statistical catch-at-age (SCAA) model, which reduces reliance on the annual mark recapture project by integrating multiple indices of abundance and biological data (catch, mark recapture abundance estimates, survey and fishery CPUE, and survey length and age composition data). In the SSEI Subdistrict, the 2021 annual harvest objective (AHO) was set at 272.7 mt, a 5% increase from 2020 (4). For SSEI, an annual longline survey is conducted to provide biological data as well as relative abundance information. Unlike NSEI, the department does not currently estimate the absolute abundance of SSEI sablefish.

There appears to be substantial movement of sablefish in and out of the SSEI area, which violates the assumption of a closed population; consequently, Peterson mark-recapture estimates of abundance or exploitation rates are not possible for this fishery. Instead, the SSEI sablefish population is managed based on relative abundance trends from survey and fishery CPUE data, as well as with survey and fishery biological data that are used to describe the age and size structure of the population and detect recruitment events.

State of Alaska Management
There are three separate internal water areas in Alaska which have state-managed limited-entry commercial sablefish fisheries. The NSEI and SSEI (Southeast Region) and the PWS Inside District (Central Region) each have separate seasons and GHLs. In the Cook Inlet Area, there is a state- managed open access sablefish fishery with a separate GHL. In the Southeast Region both the SSEI and NSEI sablefish fisheries have been managed under a license limitation program since 1984.

In 1994 the BOF adopted regulations implementing an equal share quota system where the annual GHL was divided equally between permit holders and the season was extended to allow for a more orderly fishery. In 1997 the BOF adopted this equal share system as a permanent management measure for both the NSEI and SSEI sablefish fisheries. During the February 2009 BOF meeting, the BOF made no changes affecting the regulation of commercial sablefish fisheries; however, bag and possession limits were established for the sablefish sport fishery. At the 2012 BOF meeting, a regulation was passed to require personal use and subsistence sablefish household fishing permits. Bag (50 fish per permit), vessel (200 fish per vessel) and hook (350 per permit) limits were adopted for personal use sablefish fishing at the 2015 BOF meeting.

In 2017, the CFEC approved a public petition for SSEI longline permit holders to fish pot gear due to whale depredation and rockfish bycatch issues, thus making the permit a longline/pot permit (4). The NSEI fishery is restricted to longline gear only. In 2018, the BOF amended SSEI sablefish longline and pot seasons to a concurrent season occurring from June 1 to November 15, adopted new regulations to require commercial sablefish pots to have two 4-inch circular escape rings and allowed for the possession of live sablefish for delivery as a live product. In 2018, the BOF also approved the use of pots in the personal use sablefish fishery with a limit of two pots per person, 8 pots per vessel. There is no open-access sablefish fishery in the Southeast Outside District as there are limited areas that are deep enough to support sablefish populations inside state waters. In some areas of the Gulf, the state opens the fishery concurrent with the EEZ opening.

These fisheries, which occur in Cook Inlet Area's North Gulf District and the Aleutian Island District, are open access in state waters, as the state cannot legally implement IFQ management at this time (4). The fishery GHLs are based on historic catch averages and closed once these have been reached. In Central Region, the Cook Inlet Area sablefish GHL (4) is set using a historic baseline harvest level adjusted annually by the relative change to the ABC in the federal CGOA. In 2004, the BOF adopted a sablefish fishery-specific registration, logbook requirement, and 48-hour trip limit of 1.8 mt in the Cook Inlet Area. For PWS, a limited-entry program that included gear restrictions and established vessel size classes was adopted in 1996. Between 1996 and 2014, the PWS fishery GHL was set at 110 mt, which is the midpoint of the harvest range set by a habitat-based estimate. Tagging studies conducted by NMFS and ADF&G indicate that sablefish populations throughout GOA including PWS are likely mixed.

6.3.	**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).**

Therefore, the GHL was adjusted by applying the relative change each year in the NMFS GOA sablefish ABC, which is derived from NMFS stock assessment surveys. The GHL was adjusted beginning in 2015 by applying the relative change in the GOA-wide ABC for sablefish back to 1994; this adjustment continued in 2021. PWS fishery management developed through access limitation and in 2003 into a shared quota system wherein permit holders are allocated shares of the GHL. Shares are equal within each of four vessel size classes but differ between size classes. In 2009, the BOF adopted regulations which included a registration deadline, logbooks, and catch reporting requirements; new season dates of April 15-August 31 were also adopted. The new season opening date, one month later than in previous years, was adopted to reduce the opportunity for whale depredation on hooked sablefish which predominately occurred prior to May 1.

The sole Westward Region sablefish fishery occurs in the Aleutian Islands (4). The GHL for the Aleutian Islands is set at 5% of the combined Bering Sea Aleutian Islands TAC. The state GHL can be adjusted according to recent state-waters harvest history when necessary. From 1995 to 2000 the fishery opened concurrently with the EEZ IFQ sablefish fishery. In 2001 the BOF changed the opening date of the state-waters fishery to May 15 to provide small vessel operators an opportunity to take advantage of potentially better weather conditions. From 1995 to 2000 all legal groundfish gear types were permissible during the fishery.

Effective in 2001, longline, pot, jig and hand troll became the only legal gear types. Vessels participating in the fishery are required to register and fill out logbooks provided by ADF&G. In 2013, the BOF changed the season opening and closing dates reverting them back to coincide with the federal IFQ season. The Southeast Region sport fishery for sablefish was regulated for the first time in 2009. Sport limits in 2021 were four fish of any size per day, four in possession, with an annual limit of eight fish applied to non-residents. The sablefish sport fishery in the remainder of Alaska has no limits.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
As documented above, for both stocks under consideration The stock is positioned at or above the target reference point. This is the case, even given the uncertainty about the estimate.

Evidence Basis: *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.*	☑

6.3.	**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).**

EVIDENCE:
As documented above, for both stocks under consideration The stock is positioned at or above the target reference point. This is the case, even given the uncertainty about the estimate. Please see supported evidence on references.

References:	1. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022). 2. 2021 Assessment of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska 3. Website of the Alaska Department of Fish and Game, https://www.adfg.alaska.gov/ 4. STATE OF ALASKA GROUNDFISH FISHERIES ASSOCIATED INVESTIGATIONS IN 2021. https://www.psmfc.org/tsc-drafts/2022/TSC_Report_2022_Alaska_Final.pdf

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):	

9.3.3.4 Supporting Clause 6.4.

6.4.	**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 e on impacts on the fishery resource (Appendix 1, Part 2). Such measures may be temporary and shall be based on best scientific evidence available.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑
EVIDENCE: Although for both stocks, reference points have not been exceeded, there are mechanisms in place if reference points are exceeded. **Pacific Halibut** The IPHC's interim management procedure uses a relative spawning biomass of 30% as a fishery trigger, reducing the reference fishing intensity if relative spawning biomass decreases further toward a limit reference point at 20%, where directed fishing is halted due to the critically low biomass condition (1). **Alaska Pacific Halibut** Sablefish are managed under Tier 3 of NPFMC harvest control rules (2).		
Current status/Appropriateness/Effectiveness: *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 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.*		☑
EVIDENCE: Although for both stocks, reference points have not been exceeded, there are mechanisms in place if reference points are exceeded.		
Evidence Basis: *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 on best scientific evidence available. Examples may include stock assessment reports or fishery management plans.*		☑
EVIDENCE: Although for both stocks, reference points have not been exceeded, there are mechanisms in place if reference points are exceeded Please see supported evidence on references.		
References:	1. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022). 2. 2021 Assessment of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska.	

6.4.	**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 e on impacts on the fishery resource (Appendix 1, Part 2). Such measures may be temporary and shall be based on best scientific evidence available.**								
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):									

9.3.3.5 Supporting Clause 6.5.

6.5	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑
EVIDENCE: The fishery reference points ensure that if the stocks become depleted there is a recovery plan – primarily through the reduction of fishing mortality (1, 2). Similarly, for both stocks under consideration, NOAA identifies habitats essential for managed species and conserves habitats from adverse effects on those habitats (3). These habitats are termed “Essential Fish Habitat” or EFH, defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity”. NMFS and NPFMC must describe and identify EFH in fishery management plans (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. Federal agencies that authorize, fund, or undertake actions that may adversely affect EFH must consult with NMFS, and NMFS must provide conservation recommendations to federal and state agencies regarding actions that would adversely affect EFH.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: The fishery reference points ensure that if the stocks become depleted there is a recovery plan – primarily through the reduction of fishing mortality.	
Evidence Basis: *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.*	☑
EVIDENCE: The fishery reference points ensure that if the stocks become depleted there is a recovery plan – primarily through the reduction of fishing mortality. Please see supported evidence on references.	

References:	1. Assessment of the Pacific halibut (*Hippoglossus stenolepis*) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022). 2. 2021 Assessment Of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska 3. NOAA's Essential Fish Habitat. https://www.fisheries.noaa.gov/national/habitat-conservation/essential-fish-habitat

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:	Full Conformance

6.5	**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.**	
(10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)		
Non-conformance Number (if applicable):		

9.3.4 Fundamental Clause 7. Precautionary approach

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.

9.3.4.1 Supporting Clause 7.1.

7.1.	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.[9]
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

For both stocks under consideration the precautionary approach is used to protect stocks and preserve the ecosystem.

Pacific Sablefish

The Alaska Pacific Sablefish stock is managed using a Tier system, based on knowledge and uncertainties of the stock in question (the quality of the data, precision in the model). Sablefish harvest specifications are made annually by NPFMC, and include the Overfishing Level (OFL), acceptable biological catch (ABC), and total allowable catch (TAC). TACs are generally set more conservatively than ABCs, which in turn are generally set more conservatively than OFLs. Since OFLs are consistent with MSY and catches are generally within TAC levels, harvests tend to always be at the conservative side of MSY. As can be seen below, recent catches of Alaska sablefish have been well within recommendations, indicating that the harvest control rules continue to work well and within precautionary set limits. Sablefish have been managed under Tier 3 of NPFMC harvest rules. Reference points were calculated using the average year class strength from 1977 - 2017. The updated point estimate of B40%, is 118,140 t. Since projected female spawning biomass (combined areas) for 2022 is 127,789 t (9% higher than B40%, or equivalent to B44%), sablefish is in sub-tier "a" of Tier 3. The updated point estimates of F40%, and F35% from this assessment are 0.080 and 0.094, respectively. Thus, the maximum permissible value of FABC under Tier 3a is 0.080, which translates into a 2022 ABC (combined areas) of 34,863 t. The adjusted OFL fishing mortality rate is 0.094, which translates into a 2022 OFL (combined areas) of 40,432 t. **Current model projections indicate that this stock is not subject to overfishing, not overfished, and not approaching an overfished condition (1).**

State of Alaska Survey:

In 2021, sablefish longline surveys were conducted for both the Northern Southeast Inside (NSEI) and Southern Southeast Inside (SSEI) areas (2). These surveys are designed to measure trends in relative abundance and biological characteristics of the sablefish population. A population biomass index from the PWS and Cook Inlet bottom trawl surveys is generated each year of those surveys with the catch composed of predominantly 1 and 4-yr old fish (see Skate – Research section above for more information on these surveys, (3)). PWS trawl surveys were not conducted in 2020–2021. The historical survey area will again be surveyed annually beginning in 2022. No Cook Inlet surveys have been conducted since 2019 and it is uncertain when that survey will resume.

State of Alaska Assessment

In the Southeast Region, the department uses mark-recapture methods with external tags and fin clips to estimate abundance and

[9] FAO Technical Guidelines for Responsible Fisheries No. 2 – Precautionary approach to capture fisheries and species introductions. http://www.fao.org/docrep/003/w3592e/w3592e00.htm

7.1.	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.[9]

exploitation rates for sablefish in the NSEI Sub-district. Sablefish are captured with pot gear in May or June, marked with a tag and a fin clip then released. Tags are recovered from the fishery and fish are counted at the processing plants and observed for fin clips. In addition to the mark-recapture work, an annual longline survey is conducted in NSEI to provide biological data as well as relative abundance information. In the NSEI Sub-district, the 2021 recommended ABC was 569.3 mt, a 3.1% increase from the 2020 ABC. The ABC was generated using a statistical catch-at-age (SCAA) model, which reduces reliance on the annual mark recapture project by integrating multiple indices of abundance and biological data (catch, mark recapture abundance estimates, survey, and fishery CPUE, and survey length and age composition data). In the SSEI Sub-district, the 2021 annual harvest objective (AHO) was set at 272.7 mt, a 5% increase from 2020 (3). For SSEI, an annual longline survey is conducted to provide biological data as well as relative abundance information. Unlike NSEI, the department does not currently estimate the absolute abundance of SSEI sablefish. There appears to be substantial movement of sablefish in and out of the SSEI area, which violates the assumption of a closed population; consequently, Peterson mark-recapture estimates of abundance or exploitation rates are not possible for this fishery. Instead, the SSEI sablefish population is managed based on relative abundance trends from survey and fishery CPUE data, as well as with survey and fishery biological data that are used to describe the age and size structure of the population and detect recruitment events.

State of Alaska Management

There are three separate internal water areas in Alaska which have state-managed limited-entry commercial sablefish fisheries. The NSEI and SSEI (Southeast Region) and the PWS Inside District (Central Region) each have separate seasons and GHLs. In the Cook Inlet Area, there is a state- managed open access sablefish fishery with a separate GHL. In the Southeast Region both the SSEI and NSEI sablefish fisheries have been managed under a license limitation program since 1984.

In 1994 the BOF adopted regulations implementing an equal share quota system where the annual GHL was divided equally between permit holders and the season was extended to allow for a more orderly fishery. In 1997 the BOF adopted this equal share system as a permanent management measure for both the NSEI and SSEI sablefish fisheries. During the February 2009 BOF meeting, the BOF made no changes affecting the regulation of commercial sablefish fisheries; however, bag and possession limits were established for the sablefish sport fishery. At the 2012 BOF meeting, a regulation was passed to require personal use and subsistence sablefish household fishing permits. Bag (50 fish per permit), vessel (200 fish per vessel) and hook (350 per permit) limits were adopted for personal use sablefish fishing at the 2015 BOF meeting.

In 2017, the CFEC approved a public petition for SSEI longline permit holders to fish pot gear due to whale depredation and rockfish bycatch issues, thus making the permit a longline/pot permit (3). The NSEI fishery is restricted to longline gear only. In 2018, the BOF amended SSEI sablefish longline and pot seasons to a concurrent season occurring from June 1 to November 15, adopted new regulations to require commercial sablefish pots to have two 4-inch circular escape rings and allowed for the possession of live sablefish for delivery as a live product. In 2018, the BOF also approved the use of pots in the personal use sablefish fishery with a limit of two pots per person, 8 pots per vessel. There is no open-access sablefish fishery in the Southeast Outside District as there are limited areas that are deep enough to support sablefish populations inside state waters. In some areas of the Gulf, the state opens the fishery concurrent with the EEZ opening.

These fisheries, which occur in Cook Inlet Area's North Gulf District and the Aleutian Island District, are open access in state waters, as the state cannot legally implement IFQ management at this time (3). The fishery GHLs are based on historic catch averages and closed once these have been reached. In Central Region, the Cook Inlet Area sablefish GHL (3) is set using a historic baseline harvest level adjusted annually by the relative change to the ABC in the federal CGOA. In 2004, the BOF adopted a sablefish fishery-specific registration, logbook requirement, and 48-hour trip limit of 1.8 mt in the Cook Inlet Area. For PWS, a limited-entry program that included gear restrictions and established vessel size classes was adopted in 1996. Between 1996 and 2014, the PWS fishery GHL was set at 110 mt, which is the midpoint of the harvest range set by a habitat-based estimate. Tagging studies conducted by NMFS and ADF&G indicate that sablefish populations throughout GOA including PWS are likely mixed.

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Therefore, the GHL was adjusted by applying the relative change each year in the NMFS GOA sablefish ABC, which is derived from NMFS stock assessment surveys. The GHL was adjusted beginning in 2015 by applying the relative change in the GOA-wide ABC for sablefish back to 1994; this adjustment continued in 2021. PWS fishery management developed through access limitation and in 2003 into a shared quota system wherein permit holders are allocated shares of the GHL. Shares are equal within each of four vessel size classes but differ between size classes. In 2009, the BOF adopted regulations which included a registration deadline, logbooks, and catch reporting requirements; new season dates of April 15 - August 31 were also adopted. The new season opening date, one month later than in previous years, was adopted to reduce the opportunity for whale depredation on hooked sablefish which predominately occurred prior to May 1.

The sole Westward Region sablefish fishery occurs in the Aleutian Islands (3). The GHL for the Aleutian Islands is set at 5% of the combined Bering Sea Aleutian Islands TAC. The state GHL can be adjusted according to recent state-waters harvest history when necessary. From 1995 to 2000 the fishery opened concurrently with the EEZ IFQ sablefish fishery. In 2001 the BOF changed the opening date of the state-waters fishery to May 15 to provide small vessel operators an opportunity to take advantage of potentially better weather conditions. From 1995 to 2000 all legal groundfish gear types were permissible during the fishery.

Effective in 2001, longline, pot, jig and hand troll became the only legal gear types. Vessels participating in the fishery are required to register and fill out logbooks provided by ADF&G. In 2013, the BOF changed the season opening and closing dates reverting them back to coincide with the federal IFQ season. The Southeast Region sport fishery for sablefish was regulated for the first time in 2009. Sport limits in 2021 were four fish of any size per day, four in possession, with an annual limit of eight fish applied to non-residents. The sablefish sport fishery in the remainder of Alaska has no limits.

Pacific Halibut

The 2022 stock assessment estimates a lower level of fishing intensity and higher relative stock status compared to previous assessments, as well as a 26% increase in the yield corresponding to the reference level of fishing intensity (F43%) for 2023 compared to 2022 (4).

The IPHC's interim management procedure uses a relative spawning biomass of 30% as a fishery trigger, reducing the reference fishing intensity if relative spawning biomass decreases further toward a limit reference point at 20%, where directed fishing is halted due to the critically low biomass condition. The relative spawning biomass at the beginning of 2023 was estimated to be 42% (credible interval: 21-55%), slightly higher than the estimate for 2022 (41%). Both of these estimates are higher than those from the 2021 stock assessment (i.e., 2022 was estimated at 33%), with the change caused by the higher estimate of natural mortality in the current analysis. The probability that the stock is below SB30% is estimated to be 25% at the beginning of 2023, with less than a 1% chance that the stock is below SB20%. The IPHC's current interim management procedure specifies a target level of fishing intensity of a Spawning Potential Ratio (SPR) corresponding to an F43%; this equates to the level of fishing that would reduce the lifetime spawning output per recruit to 43% of the unfished level given current biology, fishery characteristics and demographics. Based on the 2022 assessment, the 2022 fishing intensity is estimated to correspond to an F51% (credible interval: 32-64%). Stock projections were conducted using the integrated results from the stock assessment ensemble, details of IPHC Regulatory Area-specific catch sharing plans and estimates of mortality from the 2022 directed fisheries and other sources of mortality. The projections for this assessment are more optimistic than those from recent assessments due to the maturing 2012 year-class and the increase in the estimated overall productivity of the stock resulting from 3 of 4 rather than 2 of 4 models estimating natural mortality at much higher values than the historical fixed assumption of M = 0.15. This translates to a lower probability of stock decline for 2022 than in recent assessments as well as a decrease in this probability through 2023-24. Further, the trend in spawning biomass is estimated to have stabilized as the 2012 year-class continues to mature. This translates to a lower probability of stock decline at higher yields for 2023 than in recent assessments as well as a decrease in this probability through 2024-26. There is greater than a 50% probability of stock decline in 2024 (53-86/100) for all yields greater than the status quo, including the entire range of SPR values from 40-46%. The 2023 "3-year surplus" alternative corresponds to a TCEY of 43.0 million pounds 19,504 t), and a projected SPR of 48% (credible interval

7.1.	**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.[9]**

28-62%). At the reference level (a projected SPR of 43%), the probability of spawning biomass'decline from 2023 to 2024 is 75%, decreasing to 71% in three years. The one-year risk of the stock dropping below SB30% is 25% across all alternatives. Retrospective analyses for each of the four models, and a discussion of major sources of uncertainty are also included in this document.

This stock assessment for Pacific Halibut contains a broad representation of uncertainty in stock levels when compared to analyses for many other species. This is due to the inclusion of both within-model (parameter or estimation uncertainty) and among-model (structural) uncertainty. Due to the many remaining uncertainties in Pacific halibut biology (name a few) and population dynamics, a high degree of uncertainty in both stock scale and trend will continue to be an integral part of an annual management process, which can result in variable mortality limits from year to year. Potential solutions to reduce the inter-annual variability in mortality limits include management procedures that utilize multi-year management approaches, which are being tested with the MSE framework.

Current status/Appropriateness/Effectiveness: *The FAO Guidelines for the PA for fisheries management (FAO CCRF 1995) advocate a comprehensive management process that includes data collection, monitoring, research, enforcement, and review. More specifically, prior identification of desirable (target) and undesirable (limit) reference points must be carried out, and measures are required that will avoid undesirable outcomes with high probability and correct them promptly should they occur. The guidelines suggest that this be achieved through rules that specify in advance what action should be taken when specified deviations from operational targets are observed (i.e., harvest control rules). Furthermore, the guidelines suggest that a management plan should not be accepted until it has been shown to perform effectively in terms of its ability to avoid undesirable outcomes (for example through simulation trials). Lastly, the absence of adequate scientific information should not be used as a reason for postponing or failing to take measures to conserve target species, associated or dependent predator, or non-target species and their environment (https://www.sciencebase.gov/catalog/item/50538887e4b097cd4fce2446). There is evidence for the practical application of the PA for resource management and conservation. Note that the PA may be integrated into stock assessment practices, specific management measures enacted for everyday fisheries operations, or other measures. Application of the PA considers enhanced fisheries (e.g., at the policy level) where appropriate, and relevant uncertainties are considered using a suitable method of risk management (e.g., evaluation of potential impacts of increased hatchery releases on wild salmon), including that associated with the use of introduced or translocated species.*	☑

EVIDENCE:
As described above, for both stocks under consideration, there are comprehensive management process that includes data collection, monitoring, research, enforcement, and review including the specification of desirable (target) and undesirable (limit) reference points. That management documents cited, including the assessments for both stocks, outline the specification and consideration of robust desirable (target) and undesirable (limit) reference points.

Evidence Basis: *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.*	☑

EVIDENCE:
As described above, for both stocks under consideration, there is sufficient evidence that the Precautionary approach is applied to conservation and management. The management documents cited, including the assessments for both stocks, outline the specification and consideration of robust desirable (target) and undesirable (limit) reference points. Please see supported evidence on references.

References:	1. 2021 Assessment of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska

7.1.	**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.[9]**
	2. Alaska Regional Operational Plan No. ROP.CF.1J.2021.08. Northern Southeast Inside (NSEI) Subdistrict (Chatham Strait) Sablefish Longline Survey. Jacob Metzger Elisa Teodori Mariah Leeseberg and Rhea Ehresmann. 3. STATE OF ALASKA GROUNDFISH FISHERIES ASSOCIATED INVESTIGATIONS IN 2021. Prepared for the Sixty-second Annual Meeting of the Technical Subcommittee of the Canada-United States Groundfish Committee. April 2022. 4. Assessment of the Pacific halibut (Hippoglossus stenolepis) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022).

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):	

9.3.4.2 Supporting Clause 7.1.1.

7.1.1.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

Pacific Halibut

This stock assessment of Pacific Halibut contains a broad representation of uncertainty in stock levels when compared to analyses for many other species. This is due to the inclusion of both within-model (parameter or estimation uncertainty) and among-model (structural) uncertainty. Due to the many remaining uncertainties in Pacific halibut biology and population dynamics, a high degree of uncertainty in both stock scale and trend will continue to be an integral part of an annual management process, which can result in variable mortality limits from year to year. Potential solutions to reduce the inter-annual variability in mortality limits include management procedures that utilize multi-year management approaches, which are being tested with the MSE framework.

Stock projections were conducted using the integrated results from the stock assessment ensemble in tandem with summaries of the 2022 directed and non-directed fisheries. A harvest decision table provides a comparison of the relative risk (in times out of 100), using stock and fishery metrics (rows), against a range of alternative harvest levels for 2023 (columns). The block of rows entitled "Stock Trend" provides for evaluation of the risks to short term trend in spawning biomass, independent of all harvest policy calculations. The remaining rows portray risks relative to the spawning biomass reference points ("Stock Status") and fishery performance relative to the approach identified in the interim management procedure. The alternatives (columns) include several levels of mortality intended for evaluation of stock and management procedure dynamics including:

- No fishing mortality (useful to evaluate the stock trend due solely to population processes)
- A 30 million pound (~13,600 t) 2023 TCEY
- Reductions of 10%, 15%, and 18% from the 41.2 million pound coastwide TCEY set for 2022, which are 37.1, 35.0, and 33.8 million pounds (~16,800, 15,900, and 15,300 t), respectively.
- The mortality consistent with repeating the coastwide TCEY set for 2022 (41.2 million pounds, ~18,700 t; "status quo").
- The mortality at which there is a 50% chance that the spawning biomass will be smaller in three years than in 2022 ("3-year surplus")
- The mortality consistent with the current "Reference" SPR (F43%) level.
- A 60 million pound (~27,200 t) 2022 TCEY

A grid of alternative TCEY values corresponding to SPR values from 40% to 46% is also provided to allow for finer detail across the range of estimated SPR values identified by the MSE process as performing well with regard to stock and fishery objectives. For each column of the decision table, the total fishing mortality (including all sizes and sources), the coastwide TCEY and the associated level of fishing intensity projected for 2023 (median value with the 95% credible interval below) are reported.

Table 18. Harvest decision table for 2023. Columns correspond to yield alternatives and rows to risk metrics. Values in the table represent the probability in times out of 100(or percent chance of a particular risk.

		2023 Alternative			*Status quo -18%*	*Status quo -15%*	*Status quo -10%*	*Status quo*	3-Year Surplus				*Reference $F_{43\%}$*					
		Total mortality (M lb)	0.0	31.3	35.1	36.4	38.4	42.5	44.3	48.1	49.8	51.5	53.3	55.1	57.1	59.1	61.3	
		TCEY (M lb)	0.0	30.0	33.8	35.0	37.1	41.2	43.0	46.8	48.4	50.2	52.0	53.8	55.8	57.8	60.0	
		2023 fishing intensity	$F_{100\%}$	$F_{59\%}$	$F_{55\%}$	$F_{54\%}$	$F_{53\%}$	$F_{50\%}$	$F_{48\%}$	$F_{46\%}$	$F_{45\%}$	$F_{44\%}$	$F_{43\%}$	$F_{42\%}$	$F_{41\%}$	$F_{40\%}$	$F_{39\%}$	
		Fishing intensity interval	--	37-71%	34-68%	33-67%	32-66%	29-63%	28-62%	26-59%	25-59%	24-58%	24-57%	23-56%	22-55%	21-54%	21-53%	
Stock Trend (spawning biomass)	in 2024	is less than 2023	<1	20	29	32	38	49	53	63	67	71	75	79	83	86	89	a
		is 5% less than 2023	<1	2	4	5	7	13	15	22	25	28	31	35	39	43	47	b
	in 2025	is less than 2023	<1	18	27	30	35	46	50	60	64	68	72	76	80	83	87	c
		is 5% less than 2023	<1	6	11	13	16	24	28	36	40	44	48	52	57	62	67	d
	in 2026	is less than 2023	<1	20	28	31	36	46	50	60	63	67	71	75	79	82	85	e
		is 5% less than 2023	<1	10	16	18	22	31	35	43	47	51	55	59	64	68	72	f
Stock Status (Spawning biomass)	in 2024	is less than 30%	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	g
		is less than 20%	<1	<1	<1	1	1	1	1	1	1	2	2	2	2	3	3	h
	in 2025	is less than 30%	18	25	25	25	25	25	25	25	25	25	25	25	25	25	25	i
		is less than 20%	<1	<1	1	1	1	1	2	3	3	4	4	5	6	6	7	j
	in 2026	is less than 30%	6	23	24	24	24	25	25	25	25	25	25	25	25	25	25	k
		is less than 20%	<1	<1	1	1	1	2	3	4	5	6	6	7	9	10	11	l
Fishery Trend (TCEY)	in 2024	is less than 2023	0	17	24	24	25	28	31	38	41	45	50	55	59	64	69	m
		is 10% less than 2023	0	11	20	22	24	26	27	32	35	38	42	46	51	55	60	n
	in 2025	is less than 2023	0	15	22	24	25	28	30	37	41	45	50	55	60	66	71	o
		is 10% less than 2023	0	11	19	21	23	26	27	32	35	38	42	47	52	57	62	p
	in 2026	is less than 2023	0	14	21	23	24	28	30	37	41	46	51	56	62	67	72	q
		is 10% less than 2023	0	10	18	20	22	25	27	32	35	39	43	48	53	58	64	r
Fishery Status (Fishing intensity)	in 2023	is above $F_{43\%}$	0	19	24	25	26	29	31	38	42	46	50	54	59	63	68	s

Alaska Pacific Sablefish
The assessment of multiple forms of uncertainty is an integral part of the management procedure for Alaska Pacific Sablefish.

Risk Table Definitions
The NPFMC and SSC now request that all authors submit risk table analyses for all full stock assessments. The risk table approach is used to highlight externalities to the assessment that may indicate potential issues that should be considered when managers are determining future ABC recommendations, but which are not directly accounted for in the assessment model. In particular, high risk table scores can be used to justify setting an ABC below the maximum permissible ABC (as determined from standard projections and the NPFMC harvest control rules). Risk table categories and associated examples of issues to consider are provided in the Table below along with definitions of risk table scores. Risk level is determined by evaluating the severity of four types of considerations that could be used to support a scientific recommendation to reduce the ABC from the maximum permissible.

These considerations are stock assessment considerations, population dynamics considerations, environmental and ecosystem considerations, and fishery performance considerations. Examples of the types of concerns that might be relevant include the following:

1. Assessment considerations
    a. Data-inputs: biased ages, skipped surveys, lack of fishery-independent trend data.
    b. Model fits: poor fits to fits to fishery or survey data, inability to simultaneously fit multiple data inputs.
    c. Model performance: poor model convergence, multiple minima in the likelihood surface, parameters hitting bounds.
    d. Estimation uncertainty: poorly estimated but influential year classes.
    e. Retrospective bias in biomass estimates.
2. Population dynamics considerations
    a. Decreasing biomass trend
    b. Poor recent recruitment.

7.1.1.	**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.**

c. Inability of the stock to rebuild.
d. Abrupt increase or decrease in stock abundance

3. Environmental/ecosystem considerations
   a. Adverse trends in environmental/ecosystem indicators
   b. Ecosystem model results
   c. Decreases in ecosystem productivity
   d. Decreases in prey abundance or availability e. Increases in predator abundance
4. Fishery performance considerations
   a. Rapid change in fishing mortality by a gear type
   b. Change in fishery effort or catch-per-unit-effort (CPUE)
   c. Change in value of size categories resulting altered selectivity or spatial distribution
   d. Change in regulations that affect fishery behavior

Table 19. Risk table definitions and example scoring.

	Assessment-related Considerations	*Population Dynamics Considerations*	*Environmental/Ecosystem Considerations*	*Fishery Performance*
Level 1: Normal	Typical to moderately increased uncertainty/minor unresolved issues in assessment.	Stock trends are typical for the stock; recent recruitment is within normal range.	No apparent environmental/ecosystem concerns	No apparent fishery/resource-use performance and/or behavior concerns
Level 2: Substantially increased concerns	Substantially increased assessment uncertainty/ unresolved issues.	Stock trends are unusual; abundance increasing or decreasing faster than has been seen recently, or recruitment pattern is atypical.	Some indicators showing an adverse signals relevant to the stock but the pattern is not consistent across all indicators.	Some indicators showing adverse signals but the pattern is not consistent across all indicators
Level 3: Major Concern	Major problems with the stock assessment; very poor fits to data; high level of uncertainty; strong retrospective bias.	Stock trends are highly unusual; very rapid changes in stock abundance, or highly atypical recruitment patterns.	Multiple indicators showing consistent adverse signals a) across the same trophic level as the stock, and/or b) up or down trophic levels (i.e., predators and prey of the stock)	Multiple indicators showing consistent adverse signals a) across different sectors, and/or b) different gear types
Level 4: Extreme concern	Severe problems with the stock assessment; severe retrospective bias. Assessment considered unreliable.	Stock trends are unprecedented; More rapid changes in stock abundance than have ever been seen previously, or a very long stretch of poor recruitment compared to previous patterns.	Extreme anomalies in multiple ecosystem indicators that are highly likely to impact the stock; Potential for cascading effects on other ecosystem components	Extreme anomalies in multiple performance indicators that are highly likely to impact the stock

As documented in Table 19,multiple sources of uncertainty are considered in the status determination.

Assessment Related Considerations Data and model uncertainty are typically considered first under this category for a stock assessment, which can typically be summarized by data quality, data fits, and model diagnostics. The sablefish assessment is data-rich and the quality of the data that goes into the model is generally considered to be quite high. For instance, it is one of the few stocks with a long-term dedicated survey (i.e., the longline survey) and multiple sources of age and size composition with high yearly sample sizes (e.g., > 1,000 otoliths aged per year for both the longline survey and fixed gear fishery: Table 3.8). Given the breadth and quality of data, there are no data concerns for sablefish, especially considering that the longline survey was able to be completed in 2020 and 2021 despite ongoing limitations for other surveys due to the COVID-19 pandemic.

7.1.1.	**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.**

The sablefish assessment is one of only a few assessments in the North Pacific that is fit to multiple abundance indices, including fishery CPUE data. Although all indices now generally indicate population growth, there are varying signals on the rate of population increase. The longline survey abundance index (relative population numbers) increased 47%, 32%, and 9% year over year for the last three years. Similarly, the trawl survey biomass was at a time series low in 2013 but has increased almost five-fold since that time, with a 38% increase from 2019 to 2021. The fishery CPUE index was at the time series low in 2018 but increased 20% in 2019 (the 2020 data are not available yet. Conflicting signals in the indices is expected, especially given that CPUE indices are impacted by socioeconomic factors, such as targeting. In addition, surveys like the GOA trawl survey that capture fish at earlier life stages will respond to large incoming recruitment events sooner than other indices that may better reflect the adult dynamics. However, all indices share common recent growth trends, while the model is able to fit these data quite well. Moreover, the age and length composition data continue to indicate strong year classes in 2014, 2016, 2017, and a potentially strong, albeit highly uncertain, 2018-year class. However, indications of extremely large recent year classes from the composition data conflicts to some degree with signals of overall population growth from the indices of abundance. These conflicting signals in the magnitude of recent recruitment events are an important source of model tension. There are two main interpretations of these data: 1) recent recruitment is extremely large as indicated in the composition data, but survey indices are not increasing as fast as expected based on these recruitment events (model 16.5_Cont); 2) recent recruitment is very large but has also been accompanied by increasing availability of certain age classes to the various gears (model 21.12_Proposed_No_Skip_Spawn). Assuming the former (i.e., using model 16.5_Cont) leads to model estimates of recruitment that appear to be overly optimistic and that are eventually retroactively downgraded as more years of composition data become available, while also resulting in poor fits to the survey indices. Conversely, using the latter assumption (i.e., model 21.12_Proposed_No_Skip_Spawn) results in more consistent estimates of recruitment over time, albeit with an associated degradation in fit to the fixed gear fishery age composition data. However, it does appear that model 21.12_Proposed_No_Skip_Spawn is better able to account for cohort decay in the fishery age composition data. Thus, these results indicate that either recent year classes are smaller than it appears based solely on compositional data or fish in these recent year classes have lower survival to older ages (or are not being observed at as high of rates as expected). Although there are clearly some diverging signals in the compositional and index data, there is general agreement that the population is increasing due to recent high recruitment. The proposed model is able to adequately balance fitting the two data sources, though some uncertainty remains about the assumption utilized regarding the potential for increased availability of young, small fish to the fishery and survey (i.e., allowing a recent selectivity time block). Thus, until these recent cohorts have been observed for a number of years in the compositional data, there is moderate uncertainty regarding the size of the cohorts.

Despite some data conflicts, the suite of diagnostic analyses implemented demonstrate that the proposed sablefish assessment is robust and consistent. Retrospective patterns have been effectively eliminated. Thus, there are no longer any strong concerns about overestimating ABCs due to overestimated recent cohort strength. However, it is expected that the 2018-year class is being driven by the 2021 trawl survey and may be downgraded when the 2021 age composition data is included in next year's assessment. As such, projections may be slightly overoptimistic due to overestimation of the 2018-year class, but not to the extent observed for model 16.5_Cont.

As noted, there are a number of potential sources of process error for the assessment, such as lack of time varying natural mortality or fully time-varying selectivity. Although the proposed model is believed to better reflect rapidly changing sablefish dynamics, the potential mechanisms that may be driving changes in availability and associated selectivity are not well understood. Similarly, the current assessment model also does not account for spatial processes, because it assumes a single homogenous population across the entire Alaska federal management area. Despite there being a genetically panmictic population of sablefish throughout Alaskan waters, there is clear evidence of spatiotemporal heterogeneity in both the distribution of the resource and the removals (Figures 3.2 and 3.7). Although high movement rates and connectivity among regions may limit the potential for localized depletion of the resource, the lack of spatial structure in either fleet or population dynamics should be considered a source of potential assessment uncertainty in the current model.

In summary, the variety of data sources available for sablefish tend to show general agreement regarding population growth, and the proposed model is able to adequately fit all available data. Moreover, retrospective patterns and recruitment estimation

7.1.1.	**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.**

difficulties associated with previous sablefish models (16.5_Cont) have been greatly reduced. Although there is uncertainty in the magnitude of recent year classes, particularly the 2018-year class, there are no major assessment related concerns for sablefish at this time. Therefore, we rated the assessment related concern as 'level 1 – normal'.

Overall, productivity remains high, and the 2018-year class was estimated to be of similar magnitude as recent year classes, while there is evidence that the 2019-year class may also be large (Appendix 3C). Thus, what was originally identified as an anomalous and unprecedented 2014-year class during the 2017 assessment appears to be a proven, consistent, and encouraging trend. However, because of the uncertainty associated with estimating the size of the recent year classes, the systematic truncation of the age structure over the last decade, and uncertainty in how many of these new recruits will actually survive to become mature spawners, there is moderate population dynamics concerns. Hence, we rate the population dynamics as a 'level 2 – increased concern'.

Overall, indicators suggest stable temperatures at depth, moderate to warm surface temperature conditions, a mix of average to below average indicators of foraging conditions, no apparent increases in predation pressure, and reduction in potential competition due to juvenile sablefish moving off the shelf into adult slope habitat. Given that no major concerns are apparent for sablefish, we scored the environmental/ecosystem concern as 'level 1 – normal'.

Overall, the highest score for sablefish in 2021 is a 'Level 2—Increased Concern'. Since the SSC prefers not rating the risk table overall on the highest score, we also note that 2 of the 4 scores are Level 2 with the remaining 2 scores being categorized as a Level 1 (Table J). Given the lack of major concerns for sablefish along with the improved model performance of the proposed assessment compared to the 2020 model, no deductions in ABC are being recommended. However, the lack of fish > 10 years of age for an extremely long-lived species is disconcerting. Additionally, the projected maximum ABC would represent the largest catch since the late 1980s and before that in the early 1970s. Both periods were associated with declines in biomass and SSB, due to high catches and extended periods of poor recruitment. Given that sablefish are such a long-lived species along with the cyclic nature of sablefish dynamics, exploration of a capped (i.e., implementing a maximum cap on the ABC) management procedure (or an 'inventory management' strategy) for sablefish may be worthwhile. Compared to using a maximum yearly catch strategy, capped HCRs could aid in stabilizing long-term sablefish dynamics (i.e., help to prevent long-term cyclical declines as the resource transitions between high and low recruitment regimes), while also maximizing economic metrics (i.e., years with high catch of larger, more valuable fish; Licandeo *et al*., 2020). Similarly, alternate metrics of spawning potential, which better emphasize fully mature age classes (e.g., the biomass of ages > 10), could help maintain a strong spawning portfolio and avoid future contraction of the age structure, thereby improving resilience of the sablefish resource (Hixon *et al*., 2014; Lowerre-Barbieri *et al*., 2016; Licandeo *et al*., 2020).

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
For both fisheries the management procedures are guided by the inclusion and understanding of a variety of process, model, and observation uncertainties. These are documented above. Additionally, for both stocks under consideration the relationship of stock productivity in relation to reference points are considered in the context of environmental and ecosystem conditions. Thus, for both stocks, there is evidence that the management procedures are precautionary in a holistic way.

Evidence Basis: *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.*	☑

7.1.1.	**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.**

EVIDENCE:

The availability and quality of the evidence indicate that for both fisheries the management procedures are guided by the inclusion and understanding of a variety of process, model, and observation uncertainties. These are documented above. Additionally, for both stocks under consideration the relationship of stock productivity in relation to reference points are considered in the context of environmental and ecosystem conditions. Thus, for both stocks, the available evidence is of sufficient quality and adequacy that the management procedures are precautionary in a holistic way. Please see supported evidence on references.

References:	1. Assessment of the Pacific halibut (Hippoglossus stenolepis) stock at the end of 2022 PREPARED BY: IPHC SECRETARIAT (I. STEWART & A. HICKS; 15 DECEMBER 2022). **2.** 2021 Assessment of The Sablefish Stock In Alaska. https://www.fisheries.noaa.gov/resource/data/2021-assessment-sablefish-stock-alaska

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):	

9.3.4.3 Supporting Clause 7.1.2.

7.1.2.	**In the absence of adequate scientific information, appropriate research shall be initiated in a timely fashion.**	
Relevance:	Not relevant	
	This is not relevant to either of the stocks under consideration. As documented above, in multiple supporting clauses, both of the stocks have sufficient, relevant, and timely reporting and research to support assessment and management.	
Evaluation Parameters		**Met?**
Process: *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.*		☐
EVIDENCE:		
Current status/Appropriateness/Effectiveness: *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.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

Numerical score:	**Starting score**	**–**	**(**	**Number of EPs NOT met**	**x**	**3**	**)**	**=**	**Overall score**
	10								

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

9.3.4.4 Supporting Clause 7.2.

7.2.	**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.**
Relevance:	Not relevant **Note.** This clause is only applicable for new or exploratory fisheries. This is not relevant to either of the stocks under consideration. As documented above, in multiple supporting clauses, neither of the stocks are new or exploratory fisheries.

Evaluation Parameters	**Met?**
Process: *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.*	☐
EVIDENCE:	
Current status/Appropriateness/Effectiveness: *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.*	☐
EVIDENCE:	
Evidence Basis: *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.*	☐
EVIDENCE:	

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

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

9.4.1 Fundamental Clause 8. Management measures

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 that these measures are based upon verifiable evidence and advice from available objective scientific and traditional sources.

9.4.1.1 Supporting Clause 8.1.

8.1.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑

EVIDENCE:

IPHC

The components of the IPHC's management system for the 2021 and 2022 commercial Pacific halibut fishery at the binational level for the IPHC's Regulatory Areas (and NPFMC national level for the GOA and BSAI Areas) continued to reflect various long-term and short-term objectives as prescribed by established statutes, rules, and measures. The Pacific halibut fishery is managed collaboratively and harmonized between the IPHC, the NPFMC and NOAA - NMFS.

The processes remain highly integrated and timed throughput the year to allow for an assortment of scientific, economic, and social data to be collected. modelled and evaluated against various management objectives. Established rules continue to be applied and result in annual adjustments to the FMPs for the GOA and BSAI. The plans themselves are composites of several sub-plans such as those for (i) at-sea observer deployments, (ii) electronic monitoring, (iii) ecosystem management, and (iv) research.

Management Strategy Evaluation

The IPHC continues to add to its Management Strategy Evaluation (MSE) process with the aim of developing a formal process of evaluating existing and alternative management procedures for the Pacific Halibut stock against a range of scenarios that encompass observation and process uncertainty in stock assessments, alternative hypotheses about stock dynamics, and structural assumptions.

Stock Assessment

The IPHC's current interim management procedure specifies a target level of fishing intensity of a Spawning Potential Ratio (SPR) corresponding to an F43%; this equates to the level of fishing that would reduce the lifetime spawning output per recruit to 43% of the unfished level given current biology, fishery characteristics and demographics. Based on the 2021 assessment, the 2021 fishing intensity was estimated to correspond to an F46% (credible interval: 35-63%).

The projections for this assessment are more optimistic than those from the 2019 and 2020 assessments due largely to the increasing projected maturity of the 2012-year class. This translates to a lower probability of stock decline for 2022 than in recent assessments as well as a decrease in this probability through 2023-24. There is greater than a 50% probability of stock decline in 2023 (55- 64/100)

8.1.	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.

for the entire range of SPR values from 40-46%, which include the status quo TCEY and the F43% reference level. The 2022 "3-year surplus" alternative corresponds to a TCEY of 38.0 million pounds (~17,240 t), and a projected SPR of 48% (credible interval 32-63%). At the reference level (a projected SPR of 43%), the probability of spawning biomass'decline from 2022 to 2023 is 59%, decreasing to 55% in three years, as the 2012 cohort matures. The one-year risk of the stock dropping below SB30% ranges from 43% at the F46% level to 45% at the at the F40% level of fishing intensity.

NPFMC

Alaska Groundfish Harvest Specifications for 2022 and 2023

The Council's annual groundfish harvest specifications process is to apply the harvest strategy to the best available scientific information to derive annual harvest specifications. The Council's Groundfish Plan Teams and Scientific and Statistical Committee (SSC) use stock assessments to calculate biomass, overfishing levels, and acceptable biological catch (ABC) limits for each species or species group for specified management areas. Overfishing levels and ABCs provide the foundation for the Council and NMFS to develop the total allowable catch (TAC) for each species or species group. Overfishing levels and ABC amounts reflect fishery science, applied in light of the requirements of the FMPs. The TACs recommended by the Council are either at or below the ABCs. The sum of the TACs for each area (the BSAI or GOA) is constrained by the optimum yield established for that area. The annual harvest specifications also set or apportion the prohibited species catch (PSC) limits.

As for the current 2020 and 2021 specifications, the revised harvest strategy provided for orderly and controlled commercial fishing for groundfish; promoted sustainable incomes to the fishing, fish processing, and support industries; supported sustainable fishing communities; and provided a steady supply of fish products to consumers. The harvest strategy balanced groundfish harvest in the fishing year with ecosystem needs such as non-target fish stocks, marine mammals, seabirds, and habitat.

NPFMC and NOAA - NMFS

Alaska EEZ

The groundfish fisheries in Federal waters off Alaska are managed under the FMP for Groundfish of the BSAI and the FMP for Groundfish of the GOA. In these areas, groundfish harvests are managed subject to annual limits on the amounts of each species of fish, or of each group of species, that may be taken. The fishery is a closed access fishery managed under an Individual Fishing Quota (IFQ) system.

Each agency has a multi-year strategic plan that guides fisheries management decisions against a framework of long and short-term objectives that (i) support responsible and sustainable fisheries, (ii) promote economic viability across all sectors, (iii) recognize and respect indigenous treaty rights, and (iv) sustain dependent, rural communities.

ADFG - ABoF

Sablefish in federal waters are managed by regions to distribute exploitation. The acceptable biological catch (ABC) is apportioned between these regions and then allocated between gear types. A stock assessment is performed annually for the federal fishery using an age-structured model; this assessment is reviewed by the North Pacific Management Council. The sablefish fishery's management plan for 2021 for the state's NSEI and SSEI subdistricts included a small number of regulatory provisions and rules as needed to ensure that management measures reflected decisions made and were legally binding and enforceable. Typically, these included changes to fleet and area allocation tables, fishing gear characteristics, quota sharing, bycatch provisions, area closures, opening and closing dates etc.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

1. Evidence is reported previously in Supporting Clauses 1.1, 1.2, and 1.3.

8.1.	**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.**

Evidence Basis: *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.*	☑

EVIDENCE:
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. Please see supported evidence on references

References:	1. Refer to evidence provided previously in Supporting Clauses 1.1, 1.2, 1.3, 3.1, 3.1.1, 3.1.2, 3.1.3, and 3.2.4.

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**

9.4.1.2 Supporting Clause 8.1.1.

8.1.1.	**When evaluating alternative conservation and management measures, the fishery management organization shall consider their cost-effectiveness and social impact.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑
EVIDENCE: All federal and state management agencies are required by their enabling statutes, practices and policies to consider the cost effectiveness and social impacts of potential new or modified management measures. National Standard 8 of the MSA requires that conservation and management measures take into account the importance of fishery resources to fishing communities by utilizing economic and social data that are based upon the best scientific information available. The NPFMC is required to analyze potential economic, social, and/or biological impacts of proposed regulatory changes in support of Council initiatives to develop and modify management programs for the Federal groundfish fishery off Alaska. Using the NEPA process, implicated agencies evaluate the environmental and related social and economic effects of their proposed actions. Agencies also provide opportunities for public review and comment on those evaluations. The U.S. Presidential Executive Order 12866 (1993) requires benefit-cost analysis for any new regulation that is "economically significant," which is defined as having "an annual effect on the economy of $100 million or more or adversely affecting in a material way the economy, a sector of the economy, productivity, competition, [or] jobs," or creating an inconsistency with other law, or any of several other conditions. Executive Order 13563 (2011) requires agencies to quantify anticipated benefits and costs of proposed rulemakings as accurately as possible using the best available techniques.	
Current status/Appropriateness/Effectiveness: *There is evidence for the consideration of the cost-effectiveness and social impact of potential new or modified management measures.*	☑
EVIDENCE: When new or modified management measures are proposed to the IPHC Halibut fishery or to the BSAI and GOA Groundfish Management Plans, organizational teams are assigned to consider the cost-effectiveness and social impacts of all options, and to quantify the impacts on individuals and communities as realistically as possible.	
Evidence Basis: *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-effectiveness and social impact are considered. Examples may include reports, fishery management plans, regulations or other management measures.*	☑
EVIDENCE: The availability of the evidence is sufficient to substantiate that in the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact are considered. Please see supported evidence on references.	

References:	1. https://www.fisheries.noaa.gov/national/laws-and-policies/national-standard-guidelines 2. https://www.epa.gov/laws-regulations/summary-executive-order-12866-regulatory-planning-and-review

Numerical score:	**Starting score**			**Number of EPs NOT met**					**Overall score**
	10	–	(	0	x	3	)	=	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**

9.4.1.3 Supporting Clause 8.1.2.

8.1.2.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

Sablefish Fishery - bycatch and discards

Sablefish discards in groundfish target fisheries are highest in the hook and line along with trawl gear types, but the predominant source varies over times and across regions. In both the BSAI and GOA in recent years, trawl gears have constituted the primary source of discards. Generally, discards of sablefish in pot gear in non-sablefish fisheries has been low (pot includes halibut and Pacific cod targeting).

Bycatch of targeted groundfish in the sablefish fishery has consistently been dominated by GOA shortspine, thornyhead, rockfish, and sharks. On average 75% of the shortspine and thornyhead are retained and none of the shark. There is also substantial bycatch of GOA shortraker rockfish and arrowtooth flounder. The next most abundant species are GOA other skates, longnose skate, and GOA rougheye rockfish.

Habitat areas of particular concern (HAPC) biota and non-target species are also caught in the sablefish fishery as bycatch. Every year the highest bycatch group are grenadiers. The predominant prohibited species catch (PSC) in the BSAI sablefish fisheries is golden king crab, of which nearly all are caught in pot gear. Other crab species catches are highly variable. Pacific halibut PSC is mostly in the GOA hook and line fishery.

Under current NOAA regulations, release of any sablefish by the sablefish IFQ fishery is prohibited so long as there is remaining IFQ for persons onboard the fishing vessel. Unusually large year classes of sablefish since 2014 have led to increased fishery catches of small sablefish with much lower economic value than more desirable (i.e., larger) market categories. The NPFMC initiated action to consider allowing sablefish to be released by the IFQ fishery, prior to filling their quota, in December 2019. The NPFMC conducted an initial review of the sablefish release allowance during its February 2021 meeting. While the intent of this action was to allow fishermen to release small sablefish, the elements/options did not include a size limit for sablefish or a mechanism for release mortalities to be deducted from IFQ accounts in-season.

At the February 2021 NPFMC meeting, the Council suspended further action on this issue and requested that the IFQ Committee provide recommendations on the action's relative priority. The IFQ Committee's report to the Council in April 2021 indicated that the sablefish release allowance continued to be a high priority for the majority of the IFQ fleet. Given these recommendations, the Council made a motion at their October 2021 meeting to prepare and schedule for Council consideration of a small sablefish release Initial Review document when time and resources allowed.

Pacific Halibut Fishery - bycatch and discards

When situations arise that would give cause for concern, the IPHC's regulations provide for in-season actions that may include, but are not limited to, establishment or modification of the following: (a) closed areas; (b) fishing periods; (c) fishing period limits; (d) gear restrictions; (e) recreational (sport) bag limits; (f) size limits; or (g) vessel clearances. The regulations further require that all Pacific halibut that are caught but not retained shall be immediately released outboard of the roller and returned to the sea with a minimum of injury by: (a) hook straightening; (b) cutting the ganglion near the hook; or (c) carefully removing the hook by twisting it from the Pacific halibut with a gaff.

8.1.2.	**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.**

Other measures that are available to manage bycatch and discard occurrences include modifications to: (a) fishing period, (b) closed areas, (c) gear types and restrictions, and (d) size limit.

The NPFMC reports that Pacific halibut are taken as bycatch by vessels using all types of gear (trawl, hook-and-line, pot, and jig gear) in both the GOA and BSAI areas but primarily occurs in the trawl and hook-and-line groundfish fisheries. Regulations require that all halibut caught incidentally in groundfish fisheries must be discarded, regardless of whether the fish is living or dead. Halibut bycatch is controlled in the groundfish fisheries using prohibited species catch (PSC) limits for specific target fisheries, gear types, and seasons. Groundfish fishing is prohibited once a halibut PSC limit has been reached for a particular sector or season, and in some years, this has resulted in the closure of specific groundfish fisheries prior to harvesting the total allowable catch (TAC) for the year.

Current status/Appropriateness/Effectiveness: *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).*	☑

EVIDENCE:

A current example of an effective measure to manage bycatch is NOAA's proposed Amendment 123 to the FMP for Groundfish of the BSAI. If approved, the proposed rule would amend regulations governing limits on Pacific halibut prohibited species catch (PSC), or bycatch, in the BSAI. Namely, the proposed amendment would link the halibut PSC limit to halibut abundance for the Amendment 80 commercial groundfish trawl fleet in the BSAI groundfish fisheries. This action responds to the obligation in section 303(a)(11) of the *Magnuson-Stevens Act* to minimize bycatch to the extent practicable and is consistent with the *Magnuson-Stevens Act* national standards. Specifically, the proposed action: minimizes halibut PSC to the extent practicable under National Standard 9; ensures that the FMP will continue to achieve optimum yield in the BSAI groundfish fisheries on a continuing basis under National Standard 1; is based upon the best scientific information available under National Standard 2; to the extent it involves an allocation of fishing privileges, is fair and equitable, reasonably promotes conservation by reducing incidental halibut mortality caused by the Amendment 80 trawl fleet, and does not result in any excessive shares of fishing privileges under National Standard 4; and takes into account the importance of fishery resources to fishing communities under National Standard 8. The action is expected to provide incentives for the Amendment 80 fleet to minimize halibut mortality at all times and conserve and improve bycatch management of the halibut resource, and it may result in additional harvest opportunities in the commercial halibut fishery.

Evidence Basis: *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.*	☑

EVIDENCE:

8.1.2.	**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.**

The availability 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. Please see supported evidence on references.

References:

1. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/sablefish.pdf
2. Leaman, B.M., and Stewart, I.J. 2016. 2.12 Research basis for estimated Discard Mortality Rates used for Pacific halibut in longline and trawl fisheries. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2016:133-172.
3. https://www.iphc.int/uploads/pdf/regs/iphc-2022-regs.pdf
4. https://www.fisheries.noaa.gov/action/amendment-123-fishery-management-plan-groundfish-bering-sea-and-aleutian-islands

	Starting score		Number of EPs NOT met			Overall score
Numerical score:	**10**	– (	**0**	x 3)	=	**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**

9.4.1.4 Supporting Clause 8.2.

8.2.	**The fishery management organization shall prohibit dynamiting, poisoning, and other similar destructive fishing practices.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *There are management measures, or regulations, or laws that prohibit destructive fishing practices.*		☑
EVIDENCE: The U.S. Code of Federal Regulations prohibits destructive fishing practices by stipulating what type of fishing gear may be used within the U.S. EEZ. Subparts 679.2 and 679.24 of Part 679, Title 50, Chapter VI define the types of authorized fishing gear that may be used and the limitations therein, respectively.		
Current status/Appropriateness/Effectiveness: *The regulations or laws effectively prohibit dynamiting, poisoning, and other similar destructive fishing practices.*		☑
EVIDENCE: The only gears allowed for use in the IPHC fishery are hook and line gear except for Pacific halibut taken with longline or single pot gear if such retention is authorized by NOAA Fisheries. All other gears and methods are strictly prohibited. There is no allowance for any destructive fishing practice such as dynamiting and poisoning in Alaska or in US waters. The GOA and BSAI FMPs and Federal regulations make clear that the only legal gears for taking sablefish in Alaska are those that are authorized by the CFR Title 50, Chapter VI, Part 679 (Fisheries of the EEZ off Alaska), subparts 679.2 (Authorized gear) and 679.24 (Gear limitations). No destructive practices such as dynamite or poison are permitted, nor is there any evidence that such gears are being used illegally.		
Evidence Basis: *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.*		☑
EVIDENCE: The availability and adequacy of the evidence is sufficient to substantiate that the fishery management organization prohibits dynamiting, poisoning, and other similar destructive fishing practices. Please see supported evidence on references.		
References:	1. https://www.ecfr.gov/current/title-50/chapter-VI/part-679	

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**

9.4.1.5 Supporting Clause 8.3.

8.3.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

NPFMC

The Council is responsible for allocation of the sablefish resource among user groups in Alaska waters. In addition, the Alaskan Board of Fisheries (ABoF) public meetings 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 sablefish off Alaska to participate in the development of legal regulations for fisheries.

The Western Alaska Community Development Quota (CDQ) Program created by the NFMC in 1992 provides western Alaska communities opportunities to participate in the BSAI fisheries. There are 65 communities participating in the program. The Gulf of Alaska parallel to the CDQ program is the Community Quota Entity Program, which authorizes 45 eligible communities in areas 2C, 3A and 3B and one community in the Aleutian Islands to form Community Quota Entities (CQEs) that may purchase commercial halibut and sablefish quota share (QS) for lease to community residents. The overarching purpose of this program is to remedy barriers to participation in remote coastal communities and to provide these communities with long-term opportunities to access the halibut and sablefish resources.

The Council formed the Community Engagement Committee in June 2018 to identify and recommend strategies for the Council to provide effective community engagement with rural and Alaska Native communities. The Community Engagement Committee develops tools and processes to facilitate improved communication and understanding between rural communities and tribes and the Council.

IPHC

The Commission currently apportions the quota shares for the halibut fishery among commercial, sport and personal use subsistence sectors coastwise in the US and Canada. The NPFMC, on the other hand, is responsible for allocation of the halibut resource among user (e.g., commercial, sport, customary) groups in Alaska waters. ADF&G licenses anglers and sport fishing businesses and guides, monitors and reports on sport and subsistence harvests, and assists federal agencies with preparation of regulatory analyses in Alaska waters.

The Conference Board (CB) is a panel representing Canadian and American commercial and sport halibut fishers. Created in 1931 by the Commission, the Board gives the IPHC the fishers' perspective on Commission proposals presented at Annual Meetings in January. Members are designated by union and vessel owner organizations from both nations. As of 2021 there were 66 representative members and two officers in the CB34.

The Processor Advisory Board (PAB) represents halibut processors. Like the Conference Board, PAB lends its opinion regarding Commission proposals and offers recommendations at IPHC Annual Meetings.

8.3.	**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.**

Alaska

At the state level, Advisory committees (AC) are local groups that meet to discuss fish and wildlife issues, provide a local forum for those issues, and make recommendations to the ABoF. Their purpose as established by the Joint Board of Fisheries and Game includes developing regulatory proposals, evaluating regulatory proposals, and making recommendations to the appropriate fish or game board, providing a local forum for fish and wildlife conservation and use, including matters relating to habitat, consulting with individuals, organizations, and agencies. The regulations governing the advisory committee are 5 AAC Chapters 96 and 97. More than 700 Alaskans belong to 84 advisory committees up and down the coast and throughout the interior, arctic and southcentral. It is through these individuals that the ABoF develops regulations that are responsive to local needs.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

The domestic parties with interests in the Pacific halibut and sablefish fisheries are well known and have official standing with all main federal and state management and scientific entities. The parties and their members collaborate with the agencies in a number of ways, including carrying out surveys, compiling and submitting catch and effort data, and providing local knowledge and traditional knowledge. The federal and state agencies have longstanding practices of formally encouraging industry, stakeholders and the public to collaborate in the fisheries management processes.

Many of the committees and sub-committees' structures of the agencies are staffed with a wide array of industry sector representatives, stakeholders, academics, and individuals who lend their time and expertise for the betterment of the management processes.

Evidence Basis: *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.*	☑

EVIDENCE:

The availability and adequacy of the evidence is sufficient to substantiate that the fishery management organizations seek to identify domestic parties having a legitimate interest in the use and management of the fishery. Arrangements are made to consult all the interested parties and gain their collaboration in achieving responsible fisheries. Please see supported evidence on references.

References:	1. http://www.adfg.alaska.gov/index.cfm?adfg=halibut.management 2. https://www.iphc.int/uploads/pdf/cb/cb092/iphc-2022-cb092-r.pdf 3. http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main 4. https://apps-afsc.fisheries.noaa.gov/refm/docs/2020/sablefish.pdf

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:						Full Conformance

8.3.	**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.**	
(10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)		
Non-conformance Number (if applicable):		**NA`**

9.4.1.6 Supporting Clause 8.4.

8.4.	**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.**
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑

EVIDENCE:

Sablefish

Amendment 20 to the GOA FMP and Amendment 15 to the BSAI FMP established IFQ management for sablefish beginning in 1995. These amendments also allocated 20% of the fixed gear allocation of sablefish to a CDQ reserve for the BSAI. According to NOAA, since the implementation of IFQs, the number of longline vessels with sablefish IFQ harvests experienced a substantial anticipated decline from 616 in 1995 to 362 in 2011. This decrease was expected as shareholders have consolidated their holdings and fish them off fewer vessels to reduce costs.

IFQ management has increased fishery catch rates and decreased the harvest of immature fish. Catching efficiency (the average catch rate per hook for sablefish) increased 1.8 times with the change from an open access to an IFQ fishery. The change to IFQ also decreased harvest and discard of immature fish which improved the chance that these fish will reproduce at least once. Thus, the stock can provide a greater yield under IFQ at the same target fishing rate because of the selection of older fish.

All the federal IFQ fisheries and the three major state fisheries are limited access fisheries. Exploitation is regulated and controlled through TACs in federal fisheries and GHL/TACs in state fisheries. None of these fisheries is considered depleted or overexploited.

Pacific halibut

The Halibut fishery in Alaska is a closed access fishery managed using an IFQ system. The number of vessels participating in the fleet has decreased significantly since implementation of the IFQ program in the mid 1990's. Annually, NMFS issues eligible QS holders an IFQ fishing permit that authorizes participation in the IFQ fisheries. Those to whom IFQ permits are issued may harvest their annual allocation at any time during the eight plus-month IFQ halibut and sablefish seasons. NMFS monitors allocations and subsequent landings.

Current status/Appropriateness/Effectiveness:	
Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

The number and size of fishing vessels involved in Alaskan fisheries is recorded and reported annually by NMFS/AFSC. In the years after IFQ was implemented, the average annual decrease in the number of active vessels fishing Pacific halibut was about 4%, with 863 active vessels in the halibut IFQ fishery in 2016, compared to 2,060 in 1995. This demonstrates a clear ability to control and reduce capacity as necessary.

8.4.	**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.**

According to NOAA, since the implementation of IFQs, the number of longline vessels with sablefish IFQ harvests experienced a substantial anticipated decline from 616 in 1995 to 362 in 2011. This decrease was expected as shareholders have consolidated their holdings and fish them off fewer vessels to reduce costs.

Both federal and state permitting agencies maintain records on all fishing operations as well as records of all authorizations to fish allowed by them.

Evidence Basis: *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.*	☑

EVIDENCE:
The availability and 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. Please see supported evidence on references.

References:	1. https://www.sciencedirect.com/science/article/pii/S0165783616300649 2. https://www.fisheries.noaa.gov/alaska/commercial-fishing/pacific-halibut-and-sablefish-individual-fishing-quota-ifq-program 3. https://apps-afsc.fisheries.noaa.gov/refm/docs/2020/sablefish.pdf

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**

9.4.1.7 Supporting Clause 8.4.1.

8.4.1.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑
EVIDENCE: For federally managed fisheries, the MSA's National Standard 7 requires that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication. When considering alternative management measures, the Standard's guidance requires that the measures should not impose unnecessary burdens on the economy, on individuals, on private or public organizations, or on Federal, state, or local governments. Factors such as fuel costs, enforcement costs, or the burdens of collecting data may well suggest a preferred alternative. The guidance also calls for supporting analyses to demonstrate that the benefits of fishery regulation are real and substantial relative to the added research, administrative, and enforcement costs, as well as costs to the industry of compliance. In determining the benefits and costs of management measures, each management strategy considered and its impacts on different user groups in the fishery should be evaluated. The IPHC's Economic Research Program provides stakeholders with an accurate and all-sectors-encompassing assessment of the socioeconomic impact of the Pacific halibut resource that includes the full scope of Pacific halibut's contribution to regional economies of Canada and the U.S.A. To that end, the IPHC developed the Pacific Halibut Multiregional Economic Impact Assessment (PHMEIA) model that informs stakeholders on the importance of the Pacific halibut resource and fisheries to their respective communities, but also broader regions and nations, and contributes to a wholesome approach to Pacific halibut management that is optimal from both biological and socioeconomic perspective, as mandated by the Convention.	
Current status/Appropriateness/Effectiveness: *There is evidence for studies conducted on alternative management options designed to rationalize fishing.*	☑
EVIDENCE: Federally-managed fisheries for which amendments are proposed are subject to a formal review process that includes public inputs. The NEPA process is invoked to account for a variety of environmental impacts that include socioeconomic impacts and analyses of the alternative measures options under consideration. This would extend to any possible fishery rationalization impacts.	
Evidence Basis: *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.*	☑
EVIDENCE: The availability 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. Please see supported evidence on references	

References:	1. https://www.ecfr.gov/current/title-50/chapter-VI/part-600/subpart-D/section-600.340 2. https://iphc.int/management/research-and-monitoring/economic-research 3. https://www.iphc.int/uploads/pdf/economics/2022/iphc-2022-econ-01.pdf

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

8.4.1.	**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.**

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

9.4.1.8 Supporting Clause 8.5.

8.5.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑

EVIDENCE:

Sablefish

A summary of the NPFMC management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs and are summarized below.

Fish size. The fishery is primarily managed through IFQ and through Maximum Retainable Allowances for other fisheries to account for incidental catches of sablefish in those fisheries. Minimum size requirements are not currently in use. However, a recent discussion paper on sablefish discard allowance (Armstrong *et al*., 2018) provides information on biological and economic impacts for introducing minimum size regulations for sablefish. In 2018, there was a marked increase in sablefish landings for small (1-3 pound) sablefish in the BSAI fisheries, most notably the midwater pollock fishery, and an associated large decrease in value for these same sized fish (Armstrong *et al*., 2018).

Gear. Sablefish in Alaska are caught with longline, pot and bottom trawl gear. In short, longliners use streamer lines to avoid seabird bycatch, demersal trawls are required to carry raised bobbins when targeting flatfish and cod in the BSAI and the Central GOA. Research has demonstrated that this gear modification reduces unobserved mortality of Red king crab, Tanner crab, and Snow crab, reducing contact with the ocean floor by as much as 90%. In addition to this there are extensive habitat closures in Alaska. Pot gear carry biodegradable panels to avoid ghost fishing in case of gear loss, as well as escape rings in State fisheries. Mesh size for the relevant gear is specified in CFR regulation 679 (on the management of fisheries within Alaska's EEZ).

Closed seasons/areas. In 1995, Individual Fishery Quotas (IFQ) were implemented for hook-and-line vessels along with an 8- month season. The season dates have varied by several weeks since 1995, but the monthly pattern has been from March to November with the majority of landings occurring in May - June. Extensive trawl closures have been implemented to protect benthic habitat or reduce bycatch of prohibited species (i.e., salmon, crab, herring, and halibut) in the BSAI and GOA. Seasonal closures are used to reduce bycatch by closing areas where and when bycatch rates had historically been high. Over 95% of the AI management area is closed to bottom trawling (277,100 nm^2). With the Arctic FMP closure included (an area roughly 150,000 sq nm^2), almost 65% of the U.S. EEZ off Alaska is closed to bottom trawling.

Artisanal fisheries. At the time the Federal Government began the IFQ program, the State established two minor fisheries in Cook Inlet and the Aleutian Islands, so that open-access fisheries were available to fishermen that were not allowed to participate in the IFQ program. Three major state fisheries exist which are limited entry and are located in Prince William Sound, Chatham, and Clarence Strait.

Pacific Halibut

Updated IPHC regulations covering the directed halibut fisheries (commercial and sport) in 2022 can be found on the IPHC website. The full suite of NMFS fishery regulations for Alaskan waters can be found on their website. Concerning specific technical measures, a brief summary by category, as contained in these IPHC regulations, is show below.

8.5.	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.

Fishery regulations for the 2022 season include vessel licensing, provisions for in-season actions to establish or modify current management measures, seasonal closures per regulatory areas, other closed areas, IFQ and CDQs shares specifications, fishing period limits, size limits (currently 32 inches with head on, 24 inches with head off), careful release specifications for non-retained halibut, logbooks for any vessels above 27 feet in length, fishing gear allowed (main gear being hook and line but single pot extensions for sablefish exist), supervision of unloading and weighing of halibut by authorized officers, retention of tagged halibut, customary, traditional and aboriginal fishing catches, and sport fishing regulations. Such measures are meant for the protection of the entire halibut stock, including adult and juveniles, taking into account commercial, sport and traditional, customary users. For further information on each of these technical and other management measures, refer to the 2022 Pacific Halibut Regulations on the IPHC website.

Incidental halibut catch is controlled in the groundfish fisheries (i.e., non-halibut-sablefish IFQ fisheries) using PSC limits40in the GOA and the BSAI. Areas closed to halibut fishing are defined in IPHC regulations and include specific waters in the Bering Sea in Isanotski Strait. A large number of areas in GOA and BSAI waters are closed to trawling (and thus to halibut bycatch outside the directed fisheries). Details on these closures for habitat protection are available on the NPFMC website.

Further to these, trawl sweep gear modification has been required by the Council for the trawl flatfish fisheries in the Bering Sea and the central Gulf of Alaska. Elevating devices (e.g., discs or bobbins) are required to be used on the trawl sweeps, to raise the sweeps off the seabed and limit adverse impacts of trawling on the seafloor. Such modifications have been shown to be effective in limiting habitat damage as well as unobserved mortality of crab species.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
The technical measures for the Pacific Halibut and Sablefish fisheries (and other types) are described above. The measures are authorized by a suite of federal and state statutes and are necessarily intended to minimize negative impacts on non-target species, ETP species and the physical environment.

Evidence Basis: *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.*	☑

EVIDENCE:
The 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. Please see supported evidence on references.

References:

1. https://www.iphc.int/uploads/pdf/regs/iphc-2022-regs.pdf
2. https://www.ecfr.gov/current/title-50/chapter-VI/part-679
3. https://www.iphc.int/uploads/pdf/regs/iphc-2022-regs.pdf
4. https://www.npfmc.org/bsai-halibut-bycatch/
5. https://www.npfmc.org/habitat-protections/
6. https://www.npfmc.org/habitat-protections/gear-modifications/
7. https://meetings.npfmc.org/CommentReview/DownloadFile?p=b6b509dd-a14c-442b-867b-3f88fa9f8d98.pdf&fileName=D2%20Sablefish%20Discard%20Allowance.pdf
8. https://www.fisheries.noaa.gov/resource/document/ea-rir-frfa-amendment-94-bsai-groundfish-fmp-require-trawl-sweep- modification-bs

8.5.	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.
	9. https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2020_2021_cf_groundfish_regs.pdf 10. https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2020_2021_cf_groundfish_regs.pdfhttps://www.ecfr.gov/cgi-bin/text- 11. idx?SID=0cc954068b4cef56066a93c0ecbd605f&mc=true&node=pt50.13.679&rgn=div5#se50.13.679_124 12. https://apps-afsc.fisheries.noaa.gov/REFM/docs/2020/EBSecosys.pdf 13. https://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management

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**

9.4.1.9 Supporting Clause 8.5.1.

8.5.1	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.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑

EVIDENCE:

The MSA requires that bycatch be minimized to the extent practicable. In the Alaska Region, the NPFMC and NOAA Fisheries have adopted measures to limit the catch of species taken incidentally in groundfish fisheries. Certain species are designated as "prohibited species" in the fishery management plans because they are the target of other, fully utilized domestic fisheries. Prohibited species catch (PSC) include Pacific halibut.

As documented in Supporting Clause 8.5, a number of management measures are in place in the Pacific halibut and Sablefish fisheries to minimize the catch, waste and discarding of non-target species and the impact of the fishery on associated, dependent, and ETP species. Historically, only hook-and-line gear was allowed to target Pacific halibut. In recent years, vessels fishing with pot gear in certain areas or fisheries may retain Pacific halibut although this has been at very low levels. Commercial fishermen predominantly use bottom longlines (setlines), which minimally impact habitat. Setlines can incidentally catch seabirds, but widespread use of seabird avoidance devices (called streamers) in the fishery has reduced seabird bycatch by up to 90% per vessel. In general, the commercial Pacific halibut fishery is fairly selective in the fish it catches because of the size of hook needed to harvest such a large fish. Using a large hook generally reduces bycatch of smaller fish. Fishermen use circle hooks to increase catch rates, and these hooks also improve the survival of any undersized Pacific halibut caught and released. Pacific halibut are also caught in commercial fisheries targeting other species. Regulations, such as gear and fishery restrictions, are in place to reduce bycatch of Pacific halibut in those fisheries.

This National Bycatch Reduction Strategy (2016) sets national-level objectives and actions for all of NOAA Fisheries' bycatch reduction programs across its science and management enterprise to better able to fulfill its statutory obligations. The five objectives outlined below support the goal of national Strategy, to guide and coordinate NOAA Fisheries' efforts to reduce bycatch and bycatch mortality in support of sustainably managing fisheries and recovering and conserving protected species.

- Monitor and estimate the rates of bycatch and bycatch mortality in fisheries to understand the level of impact and the nature of the interaction.
- Conduct research to improve our bycatch estimates, understand the impacts of bycatch on species and community dynamics, and develop solutions to reduce bycatch and bycatch mortality.
- Conserve and manage fisheries and protected species by implementing measures to reduce bycatch and its adverse impacts.
- Enforce fishery management measures, including those aimed at reducing bycatch and bycatch mortality, to ensure compliance with applicable laws.
- Communicate to develop a common understanding of bycatch, to share information on our efforts to address bycatch, and to identify areas where we can improve.

In May 2016, NOAA issued the final rule to implement Amendment 111 to the BSAI Groundfish FMP. The rule reduced bycatch limits, also known as prohibited species catch limits, for Pacific halibut in the BSAI by specific amounts in four groundfish sectors: (i) the Amendment 80 sector (non-pollock trawl catcher/processors); (ii) the BSAI trawl limited access sector (all non-Amendment 80 trawl fishery participants); (iii) the non-trawl sector (primarily hook-and-line catcher/processors); and (iv) the Western Alaska Community Development Quota Program.

8.5.1	**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.**

NOAA's Action Plan for Fish Release Mortality Science (2016) has as its purpose to "guide NMFS science efforts related to reducing fish release mortality, improving estimates of release mortality, and better incorporating improved release mortality estimates into stock assessments and management processes." The goals of the Action Plan are to:

- Enable the use of planning tools to help managers, scientists, and other stakeholders determine which fish species, complexes, and/or fisheries would benefit most from improved mortality rate estimates.
- Facilitate the development of improved fish mortality rate estimates.
- Support effective and efficient research that leads to reduced release mortality for high priority species, complexes, and/or fisheries.
- Ensure that improved fish mortality rate estimates are incorporated effectively into stock assessments and existing management processes.

An important contribution is made through the publication of ecosystem status reports. The reports are produced annually to compile and summarize information about the status of the Alaska marine ecosystems for the NPFMC, the scientific community and the public. As of 2016, there are separate reports for the Eastern Bering Sea, Aleutian Islands, the Gulf of Alaska, 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.

The reports are the product of collaboration between federal, state, academia, and not-for-profits organizations that (i) create strong links between Alaska ecosystem research and fishery management, and (ii) spur new understanding of the connections between ecosystem components by bringing together the results of diverse research efforts.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
Refer to Supporting Clauses 8.1, 8.1.2, 8.4 and 8.5 for a description of the measures in place to minimize catch, waste, and discards; and to minimize impacts on associated, dependent, or endangered species.

Evidence Basis: *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.*	☑

EVIDENCE:
The availability and 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. Please see supported evidence in references

References:

1. https://www.fisheries.noaa.gov/international/bycatch/national-bycatch-reduction-strategy
2. Benaka, L. R., L. Sharpe, K. Abrams, M. Campbell, J. Cope, F. Darby, E.J. Dick, J. Hyde, B. Linton, C. Lunsford, D. Rioux, and Y. Swimmer. 2016. Action Plan for Fish Release Mortality Science. U.S. Dept. of Commer., NOAA, 34 p.
3. Siddon, E. 2021. Ecosystem Status Report 2021: Eastern Bering Sea, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 1007 West Third, Suite 400, Anchorage, Alaska 99501.
4. Ortiz, I. and Zador, S. 2021. Ecosystem Status Report 2021: Aleutian Islands, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 1007 West Third, Suite 400, Anchorage, Alaska 99501.
5. Ferriss, B.E. and Zador, S. 2021. Ecosystem Status Report 2021: Gulf of Alaska, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 1007 West Third,

8.5.1	**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.**									
	Suite 400, Anchorage, Alaska 99501									
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**	

9.4.1.10 Supporting Clause 8.6.

8.6	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *There is regulation for gear marking.*		☑

EVIDENCE:

Sablefish - Federal

Regulations pertaining to vessel and gear markings in the sablefish fishery are established in NMFS regulations, as prescribed in the annual management measures published in the *Federal Register* (part 679.24). They state:

1. Marking of hook-and-line, longline pot, and pot-and-line gear.
   (a) All hook-and-line, longline pot, and pot-and line marker buoys carried on board or used by any vessel regulated under this part shall be marked with the vessel's Federal fisheries permit number or ADFG vessel registration number.
   (b) Markings shall be in characters at least 4 inches (10.16 cm) in height and 0.5 inch (1.27 cm) in width in a contrasting color visible above the water line and shall be maintained so the markings are clearly visible.
   (c) Each end of a set of longline pot gear deployed to fish IFQ sablefish in the GOA must have attached a cluster of four or more marker buoys including one hard buoy ball marked with the capital letters "LP" in accordance with paragraph (a)(2) of this section, a flag mounted on a pole, and radar reflector floating on the sea surface.

Pacific Halibut - Federal

The 2022 IPHC gear regulations specify that all gear marker buoys carried on board or used by any United States of America vessel used for Pacific halibut fishing shall be marked with one of the following: (a) the vessel's State license number; or (b) the vessel's registration number. These markings shall be in characters at least four inches in height and one-half inch in width in a contrasting color visible above the water and shall be maintained in legible condition. These same requirements are mirrored in the *Federal Register* halibut catch sharing plan regulation published in March 2022.

Sablefish and Pacific Halibut - State

Gear marking requirements are stipulated in the ADFG's 2022 - 2023 Statewide Commercial Groundfish Fishing Regulations. According to 5 AAC 28.050 (Lawful gear for groundfish): (a) Unless otherwise provided or restricted by specific groundfish regulations in this chapter, groundfish may be taken only by trawls, hand troll gear, seines, mechanical jigging machines, dinglebar troll gear, longlines, or pots, except that (b) All commercial longline or skate gear buoys, or kegs and buoys for groundfish pots, must be marked with the permanent ADF&G vessel license plate number of the vessel operating the gear.

<u>5 AAC 28.051. Gear for halibut</u>

(a) Unless otherwise specified in this chapter, halibut may be taken only by hand troll gear, mechanical jigging machines, dinglebar troll gear, pots, and longlines.
(b) All commercial buoys or kegs must be marked with the permanent vessel license plate number of the vessel operating the gear.
(c) A vessel registered for another pot fishery that has a pot limit in effect may not have on board or in the water more pots in the aggregate allowed in that fishery.

<u>5 AAC 28.130. Lawful gear for Eastern Gulf of Alaska Area</u>

(a) In the Northern Southeast Inside Subdistrict and Southern Southeast Inside Subdistrict, sablefish may be taken only with longlines and pots.
(f) In the Eastern Gulf of Alaska Area, pots may not be longlined, except that pots may be longlined in the Northern Southeast Inside Subdistrict and Southern Southeast Inside Subdistrict sablefish fishery. At least one buoy on each groundfish pot must be legibly marked with only the permanent department vessel license plate number of the vessel operating the gear. The number must be

8.6	**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.**

placed on the top one-third of the buoy in numerals at least four inches high and one-half inch wide, must be in a color contrasting to the color of the buoy, and must be visible above the water surface when the buoy is attached to the groundfish pot.

<u>5 AAC 28.230. Lawful gear for Prince William Sound Area</u>
(c) A groundfish pot may not be attached to a line connected to another groundfish pot, except that in the Prince William Sound sablefish fishery groundfish pots may be connected if each end of the buoy line is marked as specified in (d) of this section.
(d) At least one buoy on each groundfish pot must be legibly marked with the permanent ADF&G vessel license plate number of the vessel operating the gear. The buoy may bear only a single number - that of the vessel operating the gear. The number must be placed on the top one-third of the buoy in numerals at least four inches high, one-half inch wide, and in a color that contrasts with the color of the buoy. The buoy must be visible on the buoy above the water surface when the buoy is attached to the groundfish pot.
(f) In the Prince William Sound Area, nonpelagic trawl gear may not be used to take groundfish, except that sablefish may be taken with shrimp trawl gear operated as specified in 5 AAC 31.225(b).
(i) In the Prince William Sound Area, the holder of a CFEC permit in a fixed gear or net gear sablefish fishery may use groundfish pots only if two or more pots are connected as specified in (c) of this section.

<u>5 AAC 28.330. Lawful gear for Cook Inlet Area</u>
(a) Except as provided in (b) of this section, groundfish may be taken only by pelagic trawls, hand troll gear, longlines, pots, or mechanical jigging machines.
(c) A groundfish pot may not be attached to a line connected to another groundfish pot, except that in the Cook Inlet Area sablefish fishery, groundfish pots may be connected by a line if at least one buoy is attached to each end of the line and each buoy is marked as specified in (d) of this section; no more than 15 groundfish pots may be attached to the same line.
(d) At least one buoy on each groundfish pot must be legibly marked with the permanent ADF&G vessel license plate number of the vessel operating the gear. The buoy may bear only a single number - that of the vessel operating the gear.

<u>5 AAC 28.430. Lawful gear for Kodiak Area</u>
(b) At least one buoy on each groundfish pot must be legibly marked with the permanent ADF&G vessel license plate number of the vessel operating the gear. The buoy may bear only a single number - that of the vessel operating the gear. The number must be placed on the top one-third of the buoy in numerals at least four inches high, one-half inch wide, and in a color that contrasts with the color of the buoy. The buoy markings must be visible on the buoy above the water surface when the buoy is attached to the groundfish pot.

<u>5 AAC 28.530. Lawful gear for Chignik Area</u>
(c) At least one buoy on each groundfish pot must be legibly marked with the permanent ADF&G vessel license plate number of the vessel operating the gear. The buoy may bear only the number of the vessel operating the gear. The number must be placed on the top one-third of the buoy in numerals at least four inches high, one-half inch wide, and in a color that contrasts with the color of the buoy. The buoy markings must be visible on the buoy above the water surface when the buoy is attached to the groundfish pot.

<u>5 AAC 28.570. Lawful gear for South Alaska Peninsula Area</u>
(e) At least one buoy on each groundfish pot must be legibly marked with the permanent ADF&G vessel license plate number of the vessel operating the gear. The buoy may bear only the number of the vessel operating the gear. The number must be painted on the top one-half of the buoy in numerals at least four inches high, one-half inch wide, and in a color that contrasts with the color of the buoy. The buoy markings must be visible on the buoy above the water surface when the buoy is attached to the groundfish pot.
(f) Sablefish may be taken only with pots, longlines, mechanical jigging machines, and hand troll gear as described in 5 AAC 28.640.\

<u>5 AAC 28.629. Lawful gear for Bering Sea-Aleutian Islands Area</u>
(a) Unless otherwise specified in this section, groundfish may be taken with the gear specified in 5 AAC 28.050.
(g) Sablefish may be taken only with pots, longlines, mechanical jigging machines, and hand troll gear as described in 5 AAC 28.640.

8.6	**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.**

Current status/Appropriateness/Effectiveness: *Fixed gear is marked according to national legislation, and lost fixed gear can be identified back to owner.*	☑
EVIDENCE: The aforementioned gear marking regulations apply to both commercial fisheries and therefore lost gear can be traced back to the owner.	
Evidence Basis: *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.*	☑
EVIDENCE: 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. Please see supported evidence on references.	

References:	1. https://www.ecfr.gov/current/title-50/chapter-VI/part-679/subpart-B/section-679.24 2. https://www.iphc.int/uploads/pdf/regs/iphc-2022-regs.pdf 3. https://www.govinfo.gov/content/pkg/FR-2022-03-07/pdf/2022-04639.pdf 4. https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2022_2023_cf_groundfish_regs.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**

9.4.1.11 Supporting Clause 8.7.

8.7.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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, processers, distributers, and 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.*	☑

EVIDENCE

The level of waste and discards in the Pacific Halibut and Sablefish fisheries is not considered to be significant nor problematic. Neither stock is depleted, nor overfished, nor is overfishing occurring. Fishing gear selectivity and impacts on other species are evaluated along technological, environmental, and benefit-cost lines when new gear types or changes to existing gear configurations are proposed by industry. Reports are produced, consultations with stakeholders are scheduled, and, where necessary, regulations are amended. When a new gear type is proposed, experimental permits may be issued on a limited basis and a testing protocol established to account for all observed impacts on the ecosystem.

NOAA has championed fishing gear studies for many years and has produced the Mobile Fishing Gear Effects Bibliography Database which is a comprehensive listing of scientific and popular literature on demersal, mobile fishing gear and the potential effects of its use. The primary focus is on trawling, dredging and raking, and the resulting direct disturbance to marine habitats and the associated biological communities. NOAA's Alaska Fisheries Science Centre's publications database includes a number of scientific studies on fishing gear, such as (i) Mobile fishing gear effects on benthic habitats, (ii) Coral impacted by fishing gear in the GOA, (iii) Ghost fishing gear, (iv) Some consequences of lost fishing gear, and (v) Principles and innovations in commercial fishing gear.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

Sablefish

The federal sablefish fishery is managed under an IFQ system. The fishery is for the most part a demersal longline fishery. Longline is typically not associated with as much ghost fishing as some other fishing gears, such as gillnets and some types of traps. Longline gear is also required to carry streamer lines to avoid seabird interactions and fishermen deploy weighted lines that sink faster and further decrease possible interactions with these animals.

In recent years, an increasing percentage of sablefish is also caught and retained with pot gear, due to depredation by whales in longline gear. Groundfish pots are required to comply with a number of specifications, including use of a biodegradable panel, and tunnel openings (rigid or soft) which must not exceed maximum dimensions. These gear constructions minimize impacts of ghost fishing and of catch of certain non-target species and sizes, hence reducing waste, discards and mortality in case of gear loss. Escape rings in pots are required in some sablefish state fisheries as per 2020-2021 state regulations.

8.7.	**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.**

In one the newest developments to reduce wastage and discards in the IFQ fishery, the NPFMC, in October 2018 took final action to allow for: (i) more efficient harvest of the halibut resource by decreasing the wastage of legal-size halibut discarded in the BSAI sablefish pot fishery, and (ii) reduced whale depredation of halibut caught on hook-and-line gear by allowing operators that hold both halibut IFQ or CDQ the opportunity to retain halibut in pot gear. This action includes the following elements: (i) an exemption to the 9-inch maximum width of the tunnel opening on pots, (ii) VMS and logbook requirements for all vessels using pot gear to fish IFQ/CDQ, and (iii) in the event that the overfishing limit for a shellfish or groundfish species is approached, regulations would allow NMFS to close IFQ fishing for halibut as necessary. Additionally, the Pribilof Islands Habitat Conservation Zone would be closed to all fishing with pot gear.

Sablefish also are caught incidentally during directed trawl fisheries for other species groups such as rockfish and deep-water flatfish. Trawl catches in 2020 were about 43% of the total catches, while in 2019 catches were about 31%. Research has demonstrated that trawl sweep gear modification required in the trawl flatfish fisheries in the EBS (since 2010) and the central GOA (since 2013) reduces unobserved mortality of red king crab, Tanner crab, and snow crab.

All new proposals, for and resulting developments to reduce waste and discards in the sablefish and other groundfish fisheries, are made available to all fishers through the NPFMC/NMFS and ABoF processes and published online for all relevant stakeholders

Pacific Halibut

Pacific halibut are captured in large numbers by vessels fishing for other species, primarily using trawl, pot, and longline gear that are targeting groundfish species such as cod, flatfish, rockfish and other species. IPHC regulations require that the fish be targeted and caught with demersal longline gears. For those hook and line fisheries, Article 15 (Careful Release of Pacific Halibut) of the 2021 fishing regulations state the following: *All Pacific halibut that are caught and are not retained shall be immediately released outboard of the roller and returned to the sea with a minimum of injury by: (a) hook straightening; (b) cutting the ganglion near the hook; or (c) carefully removing the hook by twisting it from the Pacific halibut with a gaff*. The reasons for releasing halibut in this manner are so that post release mortality can be calculated and minimized.

The IPHC has studied and is continuing to research discard mortality and survival of halibut. The IPHC website lists research information on the physiological condition and hook injury survival (hook type, size, bait, effect of fish size) and discard survival assessment.

In terms of bycatch of halibut in trawl fisheries, the groundfish trawl industry in Alaska has deployed halibut excluder devices in their gear with success. The NMFS, in collaboration with the Pacific States Marine Fisheries Commission (PSMFC) and the Alaska Whitefish Trawlers Association, tested the efficacy of a flexible sorting grate bycatch reduction device (BRD) designed to reduce halibut bycatch. The results showed that halibut bycatch was reduced numerically by 57% and by 62% by weight. Target species loss ranged from 9% to 22%.

Longline vessels in Alaska are required to deploy streamer lines and weighted lines in order to reduce bycatch of seabirds. Demersal trawl vessels such as those targeting flatfish in the BSAI and cod in the GOA are required to use modified gear with raised bobbins, found to decrease crab mortality and decrease habitat impacts.

Evidence Basis: *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*	☑

8.7.	**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.**

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.

EVIDENCE:
The availability 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. Please see supported evidence in references.

References:

1. https://apps-afsc.fisheries.noaa.gov/pubs/pubs_results.php
2. https://www.fisheries.noaa.gov/resource/data/mobile-fishing-gear-effects-bibliography-database
3. https://iphc.int/uploads/pdf/regs/iphc-2021-regs.pdf
4. http://marineconservationalliance.org/seafacts-the-development-of-halibut-excluders/
5. https://marinedebris.noaa.gov/sites/default/files/publications-files/Ghostfishing_DFG.pdf
6. https://www.ecfr.gov/cgi-bin/text-idx?SID=0cc954068b4cef56066a93c0ecbd605f&mc=true&node=pt50.13.679&rgn=div5
7. https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2020_2021_cf_groundfish_regs.pdf
8. http://meetings.npfmc.org/CommentReview/DownloadFile?p=94b0f940-78a1-45d9-bc75-3686b6ccb3a9.pdf&fileName=C4%20Action%20Memo.pdf
9. http://meetings.npfmc.org/CommentReview/DownloadFile?p=94b0f940-78a1-45d9-bc75-3686b6ccb3a9.pdf&fileName=C4%20Action%20Memo.pdf
10. https://apps-afsc.fisheries.noaa.gov/refm/docs/2020/sablefish.pdf
11. https://www.npfmc.org/habitat-protections/gear-modifications/

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**

9.4.1.12 Supporting Clause 8.8.

8.8.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑
EVIDENCE: Operational methods and gears regulated in the Pacific halibut and sablefish fisheries are described in Supporting Clause 8.7. The replacement cost of fishing gear that is either lost or damaged can be significant and fishing vessel crews make every effort to avoid snagging or, if snagging does occur, to retrieve the gear with as little damage as possible, and with as minimal impact on fisheries and ecosystems as possible.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: According to NOAA, "ghost fishing" is a part of the global marine debris issue that impacts marine organisms and the environment. Lost or discarded fishing gear that is no longer under a fisherman's control becomes known as derelict fishing gear (DFG), and it can continue to trap and kill fish, crustaceans, marine mammals, sea turtles, and seabirds. The most common types of DFG to ghost fish are gillnets and crab pots/traps, with longlines and trawls less likely to do so. Ghost fishing can impose a variety of harmful impacts, including: the ability to kill target and non-target organisms, including endangered and protected species; causing damage to underwater habitats such as coral reefs and benthic fauna; and contributing to marine pollution. Factors that cause gear to become DFG include poor weather conditions, gear conflicts with other vessels or bottom topography, gear overuse, and too much gear being used. The types of DFG most often cited for ghost fishing are, in the order of prevalence and amount of available information (a) gill nets, (b) pots/traps, (c) bottom trawls, and (d) longlines. New fishing gears have seldom been allowed for halibut fishing, where longlines are the de facto fishing method of catching halibut under IPHC management. However, since January 2017, Amendment 101 to the Groundfish FMP for GOA authorizes the use of longline pot gear in the GOA sablefish IFQ fishery. In addition, this final rule establishes management measures to minimize potential conflicts between hook-and-line and longline-pot gear used in the sablefish IFQ fisheries in the GOA. The assessment team confirms that while the impacts of ghost fishing have been established in numerous other fisheries, its impacts in regard to the Pacific Halibut and Sablefish commercial fisheries specifically, and pollution and waste more generally, have not been adequately evaluated such as through peer reviewed environmental assessments or studies. There is insufficient evidence to fully assess this Evaluation Parameter. **Response from AFDF Letter dated April 7th 2023.** In response of the potential NC above, AFDF provided a summary of fishery regulations and voluntary measures in the halibut and sablefish commercial fisheries to minimize gear loss and prevent ghost fishing. AFDF also summarized information on gear loss collected by the relevant management bodies for both Pacific halibut and sablefish (per Appendix 5). Based on the above the potential NC was removed.	
Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that 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*	☑

8.8.	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.

ghost fishing effects of lost or abandoned fishing gear, pollution, and waste. Examples may include various regulations, data, and reports.

EVIDENCE:

The assessment team concluded that the availability and adequacy of evidence such as from peer reviewed environmental assessments or studies of ghost fishing impacts or impacts on pollution and waste from lost or abandoned gear was not a matter of the public record. There is insufficient evidence to fully assess this Evaluation Parameter.

Response from AFDF Letter dated April 7th 2023.

In response to the potential NC above . AFDF provided a summary of fishery regulations and voluntary measures in the halibut and sablefish commercial fisheries to minimize gear loss and prevent ghost fishing. AFDF Also summarized information on gear loss collected by the relevant management bodies for both Pacific halibut and sablefish (per Appendix 5). Based on the above the NC was removed.

References:	1. https://marinedebris.noaa.gov/sites/default/files/publications-files/Ghostfishing_DFG.pdf							
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):									

9.4.1.13 Supporting Clause 8.9.

8.9.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *There is a system that makes available information on new developments and requirements to all fishers to avoid circumvention of fishing regulations.*		☑
EVIDENCE: The principal federal and state management agencies have made communications with the fisheries sectors, stakeholders and the public a priority in their annual or multi-year strategic plans. Newsletters, press releases, and various social platforms are used to disseminate information in real time to their audiences. Information on gear regulations, including any and all amendments or modifications, as well as on gear technology is readily available to fishers and the general public through the websites of NPFMC, NOAA/NMFS, ADFG and industry organizations, and through various meetings.		
Current status/Appropriateness/Effectiveness: *The adopted methods are successful and effective and fishing regulations are made known to the participants. Enforcement data are highlighting significant violations.*		☑
EVIDENCE: Fishing regulations including amended provisions are posted and maintained current on the websites of all principal federal and state management agencies. Information is readily available to the fishery sectors, other stakeholders and the public. Outreach initiatives are often scheduled in communities to ensure that new gear requirements are understood by harvesters. Federal and state enforcement agencies monitor and enforce fishing gear regulations.		
Evidence Basis: *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.*		☑
EVIDENCE: The availability 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. Please see supported evidence in references.		
References:	1. Websites of the principal federal and state fisheries management agencies.	

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**

9.4.1.14 Supporting Clause 8.10.

8.10	**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.**	
Relevance:	Not relevant	
	This clause is not applicable as no new gear has been introduced in the past 3 years.	
Evaluation Parameters		**Met?**
Process: *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.*		☐
EVIDENCE:		
Current status/Appropriateness/Effectiveness: *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.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

Numerical score:	**Starting score**	– (	**Number of EPs NOT met**	x 3) =	**Overall score**
	10				

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

9.4.1.15 Supporting Clause 8.11.

8.11.	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.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *There is a system of international information exchange to allow knowledge to be shared.*	☑

EVIDENCE:

The International Pacific Halibut Commission (IPHC) is an international organization established by a Convention between Canada and the United States of America. The IPHC's overarching objective is to "develop the stocks of Pacific halibut in the Convention waters to those levels which will permit the optimum yield from the fishery and to maintain the stocks at those levels."

The organization's strategic plan (2023-2027) includes five (5) enduring strategic goals in the execution of its mission and vision. They are to:

- Operate in accordance with international best practice
- Be a world leader in scientific excellence and science-based decision making
- Foster collaboration (within Contracting Parties and internationally) to enhance our science and management advice
- Create a vibrant IPHC culture
- Set the standard for fisheries commissions globally

The fostering collaboration goal (refer to 2017-2021 collaborative research plan projects) is informed by several strategies, including:

- Maintaining and developing interagency cooperation in management programs
- Fostering interagency cooperative research programs
- Maintaining and enhancing participation of stakeholders (public and private sectors) in the design and execution of Commission programs
- Enhancing knowledge sharing with Tribal and First Nation groups in the Pacific Northwest and Alaska
- Enhancing the Commission's role in public understanding of fishery science and management
- Continuing to promote interdisciplinary activities, partnership development and engagement; and
- Incorporating talented students and early career researchers in research activities.

Table 20. IPHC Biological and Ecosystem Science Research Program and Management Implications (2017-2021). (Source: iphc-2020-im096-10-p.pdf).

Primary Research Areas	*Main Objectives*	*Management implications*
Migration	Improve understanding of migration throughout all life stages (larval, juvenile, adult feeding and reproductive migrations)	Stock distribution, regional management
Reproduction	Information on sex ratios of commercial landings and improved maturity estimates	Female stock spawning biomass
Growth	Improve understanding of factors responsible for changes in size-at-age and development of tools for monitoring growth and physiological condition	Biomass estimates
DMRs and discard survival	Improve estimates of DMRs in the directed longline and guided recreational fisheries	Discard mortality estimates
Genetics and genomics	Improve understanding of the genetic structure of the population and create genomic tools (genome)	Stock distribution, local adaptation

8.11.	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.

Table 21. IPHC Externally-funded Collaborative Research (2017-2021) (Source: iphc-2020-im096-10-p.pdf).

Project #	Grant agency	Project name	PI	Partners	IPHC Budget ($US)	Management implications	Grant period
1	Saltonstall-Kennedy NOAA	Improving discard mortality rate estimates in the Pacific halibut by integrating handling practices, physiological condition and post-release survival.	**IPHC**	Alaska Pacific University	$286,121	Discard estimates	September 2017 - August 2020
2	North Pacific Research Board	Somatic growth processes in the Pacific halibut and their response to temperature, density and stress manipulation effects.	**IPHC**	AFSC-NOAA-Newport, OR	$131,891	Changes in biomass/size-at-age	September 2017 - February 2020
3	National Fish and Wildlife Foundation	Discard mortality rate characterization in the Pacific halibut recreational fishery.	**IPHC**	UA Fairbanks, APU, Grey Light Fisheries, Alaska Charter Association	$98,901	Discard estimates	April 2019 - June 2021

Current status/Appropriateness/Effectiveness: *There is evidence for international information exchange, such as meeting records or other information.*	☑

EVIDENCE:

Section 15 of the Commission's Rules of Procedure (2022) requires that:

- A report be adopted at the end of each Session of the Commission and shall be recorded in accordance with instructions of the Commission.
- The report shall embody the Commissions decisions and recommendations, including, when requested, a statement of minority views.
- Copies of final reports shall be forwarded by the Executive Director to the Contracting Parties and to the Commissioners no later than 15 days after the close of the Session.
- The Commission shall publish additional reports from time to time as it may deem desirable.
- All reports published by the Commission shall be available at the Commission's website.

The Commission's subordinate bodies are all required to produce and post a record of their meetings. They includes: (i) the Conference Board, (ii) the Management Strategy Advisory Board, (iii) the Processor Advisory Board, (iv) the Research Advisory Board, and (v) the Scientific Review Board.

Evidence Basis: *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.*	☑

EVIDENCE:

The availability and adequacy of the evidence is sufficient to substantiate that international cooperation is encouraged for research programs. Please see evidence in the references.

References:

1. https://iphc.int/the-commission
2. https://www.iphc.int/uploads/pdf/sp/iphc-2023-sp27.pdf
3. https://iphc.int/uploads/pdf/basic-texts/iphc-rop-current.pdf
4. https://iphc.int/search-results?q=collaborative%20research

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

8.11.	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.
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)	Full Conformance
Non-conformance Number (if applicable):	**10**

9.4.1.16 Supporting Clause 8.12.

8.12	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *There is collaborative research into fishing gear selectivity, fishing methods, and strategies.*	☑
EVIDENCE: The principal federal and state management agencies have formal collaborative research arrangements in place typically with non-governmental entities that span a variety of research activities. Projects involve an array of biological and environmental disciplines that frequently lead to management options for minimizing non-utilized catches. While gear selectivity may not always be a focal point of the research, how the gear interacts within its environment is usually part of the analytical component of a project (Refer to Supporting Clause 8.11 for examples of IPHC collaborative research projects from 2017 to 2021).	
Current status/Appropriateness/Effectiveness: *There is evidence of such research, and the results have been applied accordingly in fisheries management.*	☑
EVIDENCE: The principal federal and state management agencies have maintained a longstanding practice of promoting and supporting fisheries research activities within their staple of core activities. Research drives innovation in fisheries development and management practices such that when projects are completed and peer reviewed, there typically follows a period of internal and external discussions on whether and how the findings can provide benefits to the management schemes, or resolve issues, and whether they should be accepted and implemented.	
Evidence Basis: *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.*	☐
EVIDENCE: The 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. Please see supported evidence in references.	

References:	1. Refer to Supporting Clause 8.11							
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**

9.4.1.17 Supporting Clause 8.13.

8.13	**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.**	
Relevance:	Not relevant **Note:** The use of artificial structures may be appropriate for some stocks but not necessary for all. This clause may therefore not be applicable if such structures are not practical or appropriate for stocks. The use of artificial structures should be considered appropriate if one or more of the stocks under consideration has benefitted from the use of artificial structures in other fisheries, or if species with similar biological characteristics have benefitted from the use of artificial structures in other fisheries.	
	This clause is not applicable as neither fishery is an enhanced fishery.	
Evaluation Parameters		**Met?**
Process: *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.*		☐
EVIDENCE:		
Current status/Appropriateness/Effectiveness: *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.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

Numerical score:	Starting score	–	(	Number of EPs <u>NOT</u> met	x	3	)	=	Overall score
	10								

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

9.4.2 Fundamental Clause 9. Appropriate standards of fishers' competence

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

9.4.2.1 Supporting Clause 9.1.

9.1.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *There are implemented education programs for fishers (e.g., health and safety, fisheries management framework, rule and regulation, etc.).*		☑
EVIDENCE: **Halibut and Sablefish** Fishers applying for sablefish or halibut QS or IFQ must have 150 days experience working as an IFQ crewmember. There are a number of training facilities in Alaska which offer various training programs to fishers, including courses on safety and navigation. University of Alaska provides training in the form of seminars and workshops, and conducts sessions of their Alaska Young Fishermen's Summit at regular intervals.		
Current status/Appropriateness/Effectiveness: *These programs are effective in training fishers, in line with international standards and guidelines.*		☑
EVIDENCE: **Halibut and Sablefish** Any aspirant sablefish and halibut fisher must have 150 days of IFQ crewmember fishing experience before being able to receive QS or IFQ under NMFS/NOAA rules. Obtaining IFQ share most often will require the purchaser (aspirant sablefish fisher) to enter into loan capital arrangements with banks that will require comprehensive fishing business plans supported by competent, professional fishers with demonstrable fishing experience. This competence and professionalism is a learned experience with the culmination of entrants into the fishery starting at deck hand level working their way up through proof of competence. The State of Alaska, Department of Labor & Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training & Education Center, now called Alaska's Institute of Technology). One of AVTEC's main divisions is the Alaska Maritime Training Center. The goal of the Alaska Maritime Training Center is to promote safe marine operations by effectively preparing captains and crewmembers for employment in the Alaskan maritime industry. This center is a United States Coast Guard (USCG) approved training facility located in Seward, Alaska, and offers USCG/STCW-compliant maritime training (STCW is the international Standards of Training, Certification, & Watchkeeping). In addition to the standard courses offered, customized training is available to meet the specific needs of maritime companies. Courses are delivered through the use of their ship simulator, computer based navigational laboratory, and modern classrooms. The Center's mission is to provide Alaskans with the skills and technical knowledge to enable them to be productive in Alaska's maritime industry. Supplemental to their on-campus classroom training, the Alaska Maritime Training Center has a partnership with the Maritime Learning System to provide mariners with online training for entry-level USCG Licenses, endorsements, and renewals. The University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. In addition, MAP conducts sessions of their Alaska Young Fishermen's Summit (AYFS). Each Summit is an intense, 2/3-day course in all aspects of Alaska fisheries, from fisheries management and regulation to seafood markets & marketing. The target audience for these Summits is young Alaskans from coastal communities. The 2013 AYFS was held in Anchorage and the 2016 AYFS was held in January in Juneau. The 2016 conference focus was on building leadership and networking capacity in the Alaska commercial fishing industry.		

9.1.	**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.**

The Alaska Marine Safety Education Association (AMSEA) provides courses on small boating safety, drill conductor training, stability and damage control, ergonomics, dredger safety and survival at sea training.

Mainly through face-to-face meetings and various organized events, Alaska Enforcement Division (AKD) of NOAA Fisheries Office of Law Enforcement (OLE) reaches out to many Alaskan fish harvesters and industry personnel, providing current regulatory information and guidance to promote compliance and responsible fisheries.

Evidence Basis: *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.*	☑

EVIDENCE:
North Pacific Fishing Vessel Owners association (NPFVO). https://npfvoa.org/
AVTEC-Alaska's Institute of Technology. https://avtec.edu/AMTC.htm
University of Alaska Sea Grant Marine Advisory Program (MAP). https://alaskaseagrant.org/marine-advisory/, http://fishbiz.seagrant.uaf.edu
Alaska Marine Safety Education Association (AMSEA) - Safety and Survival Training. https://www.edumaritime.net/alaska/alaska-marine-safety-education-association-amsea-sitka

References:								
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):								

9.4.2.2 Supporting Clause 9.2.

9.2.	**States, with the assistance of relevant international organizations, shall 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 (1995), as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *There are relevant measures of the FAO CCFR and other applicable environmental and other standards being exposed to fishers for their training.*	☑
EVIDENCE: **Halibut and Sablefish** All regulations governing the sablefish and halibut fisheries are available on the IPHC, NPFMC and NMFS websites, and the results of any changes are widely discussed and communicated. Alaska Enforcement Division (AKD) engages in outreach to fishers and industry personnel, providing current regulatory information and guidance to promote compliance and responsible fisheries.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: To increase communications and understanding between the regulated users and enforcement personnel and to minimize harm to fishery resources, the Alaska Enforcement Division (AKD) of NOAA Fisheries Office of Law Enforcement (OLE) strives to maintain a positive and productive relationship with all harvesters and industry personnel. In addition to daily personal interactions on the water, docks, and in processing facilities, AKD contacts thousands of harvesters and industry personnel at organized events, including trade shows, and responds to email and telephone inquiries, providing current regulatory information and guidance to promote compliance and responsible fisheries. All regulations governing the sablefish and halibut fisheries are available on the IPHC NPFMC and NMFS websites, as previously documented. Changes to regulations are considered only after detailed and rigorous processes which include open and public discussions, and the results of any changes are widely communicated.	
Evidence Basis: *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.*	☑
EVIDENCE: Related information where to find most important provisions of the FAO CCRF, can be found at the link provided, https://www.alaskaseafood.org/rfm-certification/.	

References:								
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:								Full Conformance

9.2.	**States, with the assistance of relevant international organizations, shall 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 (1995), as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations.**	
(10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)		
Non-conformance Number (if applicable):		

9.4.2.3 Supporting Clause 9.3.

9.3.	**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.**
Relevance:	Relevant.

Evaluation Parameters	**Met?**
Process: *There is a system to collect and maintain fisher records.* *Current Status/Appropriateness/Effectiveness:* *Evidence Basis:*	☑
EVIDENCE: Data on fishers are maintained in a number of agencies, including AKFIN and CFEC. Some of the information is confidential, while a substantial amount is published in summary form annually.	
Current status/Appropriateness/Effectiveness: *These records are considered accurate and effective for management purposes.*	☑
EVIDENCE: **Halibut and Sablefish** Any aspirant sablefish and halibut fisher must have demonstrated 150 days of sablefish or halibut fishing experience before being able to purchase IFQs. Competence and professionalism are typically a learned experience, with the entrants into the fishery usually starting at deck hand level working their way up169. Annually, NMFS issues eligible Quota Shareholders an IFQ fishing permit that authorizes participation in the IFQ fisheries for sablefish and halibut. Detailed data on the number and location of Alaskan fishers, vessels, permits issued, etc. can be found in Fissel *et al*. (2020). These authors note that certain information on Alaskan fisheries has been compiled through the Alaska Fisheries Information Network (AKFIN), although selected studies may not be publicly available as some information is confidential. The Alaskan fishing fleet, including sablefish vessels, was profiled by AKFIN in a document from 2012. Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska's Commercial Fisheries Entry Commission website. 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 ADF&G copy of the fish ticket at the time of delivery.	
Evidence Basis: *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.*	☑
EVIDENCE: The Restricted Access Management Program (RAM), https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/restricted-access-management-program. The Alaska Commercial Fisheries Entry Commission (CFEC), https://www.cfec.state.ak.us/annrpts/AR2019.pdf.	

References:	Fissel, B., M. Dalton, B. Garber-Yonts, A. Haynie, S. Kasperski, J. Lee, D. Lew, C. Seung, K. Sparks, M. Szymkowiak, and S. Wise. 2020. "Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, 2019", NPFMC, November, 2020. https://www.fisheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-bering-sea-aleutian-islands

Numerical score:	**Starting score**	**–**	**Number of EPs NOT met**	**x**	**3**	**=**	**Overall score**

9.3.	**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.**								
	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):									

9.4.3 Fundamental Clause 10. Effective legal and administrative framework

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.

9.4.3.1 Supporting Clause 10.1.

10.1.	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.
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *There are clear mechanisms established for fisheries monitoring, surveillance, control, and enforcement.*	☑

EVIDENCE:

The legal, policy and administrative frameworks that define how the principal federal and state management agencies are to operate and the environment in which they are to do so at the state, national and binational levels have been in place for many decades. There is evidence of an ongoing and effective level of cooperation between all the agencies that collectively continue to deliver positive conservation and sustainability outcomes for the Pacific halibut and sablefish resources and the marine environment on which the species depend.

The Monitoring, Control and Surveillance (MCS) programs operated by the federal and state enforcement agencies (NMFS, USCG; ADPS's AWT) perform at a high level of compliance effectiveness in monitoring the diverse Pacific halibut and sablefish fishing fleets that operate within state waters (0-3 nm) and Alaska's EEZ (3-200 nm). The USCG and NMFS's Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50 CFR 679 (on the management of fisheries off the Alaska EEZ). The AWT enforces halibut regulations in state waters. All landings of halibut must be reported to NMFS via its mandatory "e-landings" reporting system .

In 2021, USCG District 17 conducted 515 boardings on commercial, charter, and recreational vessels targeting halibut and sablefish. Personnel conducted 152 boardings of IFQ halibut or sablefish vessels, detecting 22 fisheries violations, representing 76% of the commercial violations detected. The overall compliance rate for these fisheries was 96% in 2021. The top violations included (i) logbook discrepancies, (ii) no IFQ permit and/or Federal Fisheries permit (FFP) onboard, (iii) sea-bird avoidance gear not onboard or improperly constructed, (iv) improper marked buoys, and (v) failure to retain Pacific cod.

In a letter dated March 5, 2021, the Southern Detachment Commander for the ADPS's AWT provided information on the AWT's enforcement presence during the Chatham Sablefish fishery. He noted that AWT has both an at-sea and dockside presence during this fishery. Due to the length of the season, personnel do not conduct vessel-based patrols specifically targeting operators in the fishery, but frequently have vessels in Chatham conducting multi-purpose patrols. When commercial vessels are observed they are contacted and inspected for compliance with the fishery they are participating in. Dockside inspections are conducted by Troopers in ports where product is being delivered. The representative stated that the AWT does not dedicate Troopers specifically to sablefish offloads but when Troopers observer them they conduct inspections. The Division also has post-season enforcement efforts of the fishery when managers become aware of issues that occurred in-season.

The IPHC does not actively enforce regulations but relies on the enforcement mechanisms of the Contracting Parties (Convention, Article IV). The Contracting Parties provide extensive annual reports to the IPHC regarding their fishery management, catch monitoring and accounting, and enforcement activities.

10.1.	**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.**

Joint Enforcement Agreement

The purpose of the Joint Enforcement Agreement (JEA) between NOAA-OLE and the Alaska Wildlife Troopers (AWT) is to support operations, administration, and funding for AWT to enforce Federal laws and regulations under the Magnuson-Stevens Act, Endangered Species Act, Marine Mammal Protection Act, Lacey Act, and Northern Pacific Halibut Act. Central to this JEA is the prevention and detection of violations by federally deputized Wildlife Troopers. In essence, deputized Wildlife Troopers provide an overt presence and force multiplier for Federal fisheries enforcement.

The reporting year for the JEA differed slightly from the Federal fiscal year: the "2020" JEA report ran from July 1, 2020, through June 30, 2021. AWT recorded the following actions in direct support of OLE and marine resource protection.

- 315 vessels boarded (commercial, charter, sportfish, and subsistence) including 111 gear inspections performed.
- 698 contacts (industry and public) during execution of field operations.
- 757 additional contacts through 41 outreach activities.
- 35 State warnings and 36 State citations (many are common state/federal fisheries); and
- 20 cases referred to OLE for federal enforcement action including 17 from JEA operation and 3 from non-JEA operations.

NOAA - OLE continued its outreach and education efforts aimed at facilitating and encouraging responsible and sustainable uses of marine resources. Approximately 16 community-based meetings were held remotely because of the COVID-19 pandemic between April and September 2021. Topics discussed were wide-ranging and included OLE priorities, enforcement procedures, regulations, new CHP requirements, fisheries management, and observer program.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

NOAA-OGC Civil Administrative Cases

In 2021, the NOAA Office of General Counsel, Enforcement Section (GCES) issued seven Notices of Violation and Assessment (NOVAs) during the reporting period. Examples included:

- AK1906496; Keta Seafoods, L.L.C. and Gregory V. McMillan Shoreside processor Keta Seafoods, LLC, and owner Gregory V. McMillan were charged jointly and severally under the Northern Pacific Halibut Act (NPHA) with failing to submit a required IFQ Registered Buyers ex- vessel Volume and Value Report. A $1,500 NOVA was issued.
- AK2004893; F/V Marathon Owner Marathon Fisheries, Inc. and operator Martin Stam were charged jointly and severally under the Magnuson-Stevens Act (MSA) with exceeding the maximum retainable amount of Pacific cod. A $3,625 NOVA was issued.
- AK2003816; F/V Gulf Maiden Owner Gulf Maiden Corporation and operator Randall Shears were charged jointly and severally under the NPHA and MSA with failing to return Pacific halibut to the sea with a minimum of injury, unlawful discard of rockfish and Pacific cod, and failure to record discards. A $22,800 NOVA was issued.
- AK2005521; F/V Legacy Crewman Tusi Tausaga was charged under the MSA with observer assault. A $72,000 NOVA was issued

NOAA-OGC Cases Settled

In 2021, the Office reported that a total of seven settlement agreements in respect of various civil administrative cases were entered into during the reporting period. Examples included:

10.1.	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.

- AK1905306; F/V Pacific Sojourn Owner Sojourn Fisheries, LLC and operator Roy Wilson were charged jointly and severally under the MSA with unlawfully discarding IFQ sablefish and failing to log the discards. A $21,500 NOVA was issued. The case settled for $17,200.
- AK1905767 and AK1905392 F/V Anita Owner F/V Anita LLC and operator Jay Gillman were charged jointly and severally under the MSA and the NPHA with discarding IFQ sablefish and IFQ halibut, failing to report discards, and failing to register an IFQ fishing trip in the Observer Declare and Deploy System. A $78,250 NOVA was issued. The case settled for $55,270.
- AK2005638; Silver Bay Seafoods, LLC Plant operator was charged under the MSA for exceeding the applicable Rockfish Program processing cap for Pacific cod by 24,849 pounds, a 25.9% overage. A $20,475.58 amended NOVA was issued. The case settled for $18,428.
- AK1906825; F/V Cameron Owner Overa Fisheries, LLC and operator Roger Overa were charged jointly and severally under the MSA with operating a vessel in the Gulf of Alaska Pacific cod fishery without carrying an operable NMFS-approved Vessel Monitoring System (VMS) and without complying with VMS requirements. A $15,000 NOVA was issued, and the case settled for $10,000.
- AK2003816; F/V Gulf Maiden Owner Gulf Maiden Corporation and operator Randall Shears were charged jointly and severally under the NPHA and MSA with failing to return Pacific halibut to the sea with a minimum of injury, unlawful discard of rockfish and Pacific cod, and failure to record discards. A $22,800 NOVA was issued, and the case settled for $20,250.

Criminal Sentencing
NOAA OLE and GCES assisted the U.S. Attorney's Office in Anchorage with the following criminal prosecution in U.S. District Court: United States v. Stevens, No. 3:20-cr-00773-JMK-DMS (D. Alaska 2021). On August 5, 2021, James A. Stevens, vessel owner, operator, fleet manager, and IFQ permit holder was sentenced for violating the Lacey Act's felony false labeling provision. Stevens was ordered to pay a $1,000,000 fine, serve six months in federal prison, 126 days in a halfway house, and perform 80 hours of community service. During the three years that he is supervised by the United States Probation Office after he is released from prison, Stevens will be subject to VMS and EM conditions, drug testing, and other standard conditions. Stevens pled guilty to knowingly submitting false information concerning the locations and regulatory areas where 903,208 pounds of IFQ halibut and IFQ sablefish were harvested on IFQ landing reports, ADFG fish tickets, and in his logbooks. His crime spanned four IFQ fishing seasons (2014 - 2017).

North Pacific Observer Program
The Program continues to be the largest observer program in the country and covers vessels in both partial coverage and full coverage. In the full coverage component of the program, every trip is monitored by 1 or 2 observers and the vast majority of groundfish harvest is covered by this portion of the program. Each year, the Annual Deployment Plan (ADP) describes the science-driven method for deployment of observers on vessels in the partial coverage component of the program (50 CFR 679.51(a)).

Observer Program - 2021
Details for the 2021 operational year were presented in draft form to the Council in June 2022. In December 2020, NMFS released the final 2021 ADP. In 2021 EM was deployed according to trip-selection. Due to limitations on transportation and health mandates associated with COVID-19, observers were deployed according to a port- based trip selection model. Under this model, observers were deployed on randomly selected trips from specific ports. This method excluded trips from observation if they did not depart and land within a port that was on the list of observable ports. The observable ports were identified as ports where travel and lodging conditions allowed observers to meet and maintain applicable health mandates and advisories for deployment into the commercial fisheries and where there were expected to be enough fishing trips originating and ending in these ports to make it cost effective to place observers in these communities.

Despite the ongoing challenges of COVID-19 in 2021, the agency was able to safely continue most Observer Program operations. There were 378 individual observers that were trained, briefed, and equipped for deployment to vessels and processing facilities operating in the BSAI and GOA groundfish and halibut fisheries. Twenty Fisheries Monitoring and Analysis Division (FMA) staff members completed 532 debriefings from Seattle and Anchorage; the majority of debriefings were completed virtually. In 2021,

10.1.	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.

observers collected data on board 296 fixed gear and trawl vessels and at 12 processing facilities for a total of 35,769 observer days (32,672 full coverage days on vessels and in plants; and 3,097 partial coverage days on vessels and plants). NMFS approved 170 vessels in the 2021 EM selection pool and of these, 125 vessels fished at least 1 trip. In 2021, EM data was collected from 105 unique vessels on a total of 279 trips (195 hook-and-line trips and 84 pot trips). Overall, for all federal fisheries off Alaska, 3,747 trips (43.2%) and 423 vessels (44.2%) were monitored by either an observer or EM system in 2021.

In its December 2021 report to the NPFMC, NOAA-OLE noted that in a normal year, very few observer contracts extend beyond 90 days. However, due to ongoing impacts from the COVID-19 pandemic in FY21, many contract extension were approved by the NPOP, resulting in longer and fewer observer deployments. Observer debriefings were completed remotely.

In FY21, OLE received 715 observer statements of potential violations, with 4,247 occurrences described. In FY20, OLE received 597 statements describing 3,422 occurrences. In FY19, the last "normal" year had 956 statements describing 7,576 occurrences. The NPOP increased from deploying observers from 1 port (2020 onset of the pandemic) to 14.

Electronic Monitoring

Electronic monitoring (EM) has replaced human observers on some vessels fishing pot and longline gear in the sablefish fishery as well as other fixed gear fisheries. Vessels fishing pot gear have been observed using EM since 2019. A sub-sample of video is reviewed and a count of each species is recorded. This fish count is extrapolated to the whole set and the extrapolated set weight is calculated as the extrapolated count times the average weight for vessel strata, e.g., the area, gear, target, and more. The system is intended to inform the stock assessment function. It does not support an enforcement application at this time.

Evidence Basis: *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.*	☑

EVIDENCE:

The 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. Please see supported evidence in references.

References:

1. North Pacific Observer Program 2021 Annual Report: https://repository.library.noaa.gov/view/noaa/47114
2. NOAA and USCG Operational Reports to the IPHC and the NPFMC for FY 20 and FY 21.

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**

9.4.3.2 Supporting Clause 10.2.

10.2.	**Fishing vessels shall not be allowed to operate on the stock under consideration in question without specific authorization.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *There is a mechanism or system established to maintain a record of fishing authorizations.*		☑
EVIDENCE: A comprehensive system is established to maintain a record of fishing authorizations. A Federal fisheries permit is required for US vessels used to fish for groundfish in the Gulf of Alaska or Bering Sea and Aleutian Islands. This permit is also required for vessels used to fish for any non-groundfish species and that are required to retain any bycatch of groundfish. A Federal processor permit is also required for shoreside processors that receive and/or process groundfish harvested from Federal waters (or from any Federally permitted vessels). U.S. commercial fishing vessels are required by state laws to be in possession of a current fishing or landing permit from the appropriate state agency in order to land groundfish in area. Federal Limited Entry (LE) permits authorize fishing within limits and restrictions specified for those permits.		
Current status/Appropriateness/Effectiveness: *This mechanism is effective for maintaining updated records of fishing authorizations and ensuring fishing vessels operate with appropriate authorization.*		☑
EVIDENCE: The permitting system is comprehensive and enforceable. It is effective in ensuring updated records of authorized fishery participation. Fishing permits are a fundamental component of the fishery enforcement system and fishing without a valid permit is a violation.		
Evidence Basis: *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.*		☑
EVIDENCE: The evidence is sufficient to substantiate that fishing vessels are not allowed to operate on the stock under consideration in question without specific authorization. Please see supported evidence on references.		
References:	1. https://www.fisheries.noaa.gov/alaska/commercial-fishing/permits-and-licenses-issued-alaska#federal-fisheries-permits-(ffp)/federal-processor-permits-(fpp)	

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**

9.4.3.3 Supporting Clause 10.3.

10.3.	**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 enforcement of applicable measures with respect to fishing operations and related activities in waters outside the States jurisdiction.**
Relevance:	Not relevant **Note.** Not applicable if the fishery does not occur outside the State's EEZ.
	Neither fishery occurs beyond the U.S. EEZ.

Evaluation Parameters	**Met?**
Process: *There is a mechanism or system established to conduct enforcement operations outside the State's jurisdiction.*	☐
EVIDENCE:	
Current status/Appropriateness/Effectiveness: *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 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, 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 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).*	☐
EVIDENCE:	
Evidence Basis: *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.*	☐
EVIDENCE:	

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

9.4.3.4 Supporting Clause 10.3.1.

10.3.1.	**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 non-participants 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.**								
Relevance:	Not relevant **Note:** Not applicable if the fishery does not occur outside the State's Exclusive Economic Zone.								
	Neither fishery occurs beyond the U.S. EEZ.								
Evaluation Parameters									**Met?**
Process: *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 .*									☐
EVIDENCE:									
Current status/Appropriateness/Effectiveness: *These measures are effective in deterring such practices.*									☐
EVIDENCE:									
Evidence Basis: *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.*									☐
EVIDENCE:									
References:									
Numerical score:	**Starting score**	**–**	**(**	**Number of EPs <u>NOT</u> met**	**x**	**3**	**)**	**=**	**Overall score**
	10								
Corresponding Confidence Rating: (10 = High; 4 or 7 = Medium; 1 = Low)									Low/Medium/High
Corresponding Conformance Level: (10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)									Critical NC/Major NC/Minor NC/Full Conformance
Non-conformance Number (if applicable):									

9.4.3.5 Supporting Clause 10.4.

10.4.	**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.**	
Relevance:	Not relevant **Note:** Not applicable if no foreign vessels fish in the State's EEZ, or if its vessels do not fish in high seas or in another State's EEZ.	
	Not relevant since no foreign vessels are licensed to fish within the U.S. EEZ. U.S. vessels do not fish in the high seas or in another State's EEZ.	
Evaluation Parameters		**Met?**
Process: *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.*		☐
EVIDENCE:		
Current status/Appropriateness/Effectiveness: *These vessels have been issued with a Certificate of Registry and they are required to carry it on board.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

Numerical score:	**Starting score**	–	(	**Number of EPs NOT met**	x	3	)	=	**Overall score**
	10								

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

9.4.3.6 Supporting Clause 10.4.1.

10.4.1.	**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.**	
Relevance:	Not relevant **Note:** Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ.	
	Not relevant since no foreign vessels are licensed to fish within the U.S. EEZ. U.S. vessels do not fish in the high seas or in another State's EEZ.	
Evaluation Parameters		**Met?**
Process: *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.*		☐
EVIDENCE:		
Current status/Appropriateness/Effectiveness: *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.*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

Numerical score:	**Starting score**	–	(	**Number of EPs NOT met**	x	3	)	=	**Overall score**
	10								

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

9.4.4 Fundamental Clause 11. Framework for sanctions

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

9.4.4.1 Supporting Clause 11.1.

11.1.	**States laws of adequate severity shall be in place that provide for effective sanctions.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *The system of States laws is of adequate severity to provide for effective sanctions.*		☑

EVIDENCE:

NOAA has authority and responsibility under more than 30 federal statutes to protect living marine resources, including marine areas and species, and manage sustainable fisheries. A large proportion of NOAA's enforcement cases are brought under seven statutes – the *Magnuson Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act)*, the *National Marine Sanctuaries Act*, the *Endangered Species Act*, the *Marine Mammal Protection Act*, the *Lacey Act*, the *Northern Pacific Halibut Act*, and the *Antarctic Marine Living Resources Convention Act*. Detailed penalty matrixes and offense level schedules exist for these statutes as well as for the *Port State Measures Agreement Act*.

NOAA's Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions, as revised, continues to ensure that: (1) civil administrative penalties and permit sanctions are assessed in accordance with the laws that NOAA enforces in a fair and consistent manner; (2) penalties and permit sanctions are appropriate for the gravity of the violation; (3) penalties and permit sanctions are sufficient to deter both individual violators and the regulated community as a whole from committing violations; (4) economic incentives for noncompliance are eliminated; and (5) compliance is expeditiously achieved and maintained to protect natural resources.

In general, when a law enforcement officer or agent identifies a statutory or regulatory violation, he or she may pursue one of several available options, depending on the nature and seriousness of the violation. Where a violation is minor or is merely technical, having little to no impact on marine resources, the officer or agent may provide compliance assistance, issue a "Fix-It Ticket," which provides the alleged violator with an opportunity to correct the violation within a certain amount of time and waives all penalties if the alleged violator takes appropriate curative action or issue a Written Warning.

For certain violations, an OLE officer or agent may issue a "Summary Settlement offer" under authority delegated to OLE by the NOAA General Counsel. Under the terms of a Summary Settlement offer, an alleged violator receives a document explaining the alleged violation and the alleged violator may resolve the matter expeditiously by paying a reduced penalty. Summary Settlement schedules developed by the Office of General Counsel, with input from the NOAA Office of Law Enforcement and, often, the relevant program office, provide a listing of violations that OLE is authorized to handle via the Summary Settlement process.

Where an officer or agent determines that an alleged violation is significant, or where an alleged violator has one or more prior violations, or does not pay a proposed summary settlement amount, the officer or agent will refer the case to the NOAA General Counsel's Enforcement Section for further action. U.S. Coast Guard personnel, state and territorial officers operating under Cooperative Enforcement Agreements, and law enforcement personnel from the U.S. Fish and Wildlife Service, Customs and Border Protection, or other federal agencies may also uncover potential violations, and where appropriate, may submit proposed cases to OLE to determine the proper action to take.

Under this Policy, penalties and permit sanctions are based on two criteria: (1) A "base penalty" calculated by adding (a) an initial base penalty amount and permit sanction reflective of the gravity of the violation and the culpability of the violator and (b) adjustments to the initial base penalty and permit sanction upward or downward to reflect the particular circumstances of a specific violation; and (2) an additional amount added to the base penalty to recoup the proceeds of any unlawful activity and any additional economic benefit of noncompliance. This Policy uses a penalty and permit sanction matrix for each major statute that NOAA enforces

11.1.	States laws of adequate severity shall be in place that provide for effective sanctions.

with penalty and permit sanction ranges to be applied nationally. This approach ensures that NOAA attorneys are provided with sufficient guidance in recommending penalties, and helps ensure fairness and consistency of approach across NOAA statutes, across fisheries, and across the country.

For state-managed fisheries in Alaska, misdemeanor commercial fishing penalties are described in the Alaska Statutes, Title 16 (Fish and Game), Chapter 5 (Fish and Game Code), Section 723. Strict liability commercial fishing penalties are covered in Section 722.

There is a longstanding practice of cooperation between Federal and state enforcement agencies in relation to planning and operations through Joint Enforcement Agreements. Federal funding is provided to the state to undertake incremental enforcement of federally managed fisheries jointly with federal agents. The funding agreement includes specific operational goals the state is required to achieve.

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:
There is sufficient evidence to demonstrate that US penalty and sanctions provisions are applied fairly, consistently and transparently across the various violation categories. The sanctions are seemingly effective as deterrence since the federal agency is not in the business of wanting sanctions to be ineffective. That said, there is no evidence is systematic non-compliance by harvesters, processors and retailers/wholesalers.

According to the ADPS-AWT, violations of the state's Pacific halibut and sablefish regulations are infrequent, and often a matter of the person's ignorance of the regulatory requirement.

Evidence Basis: *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.*	☑

EVIDENCE:
The availability, quality, and adequacy of the evidence is sufficient to substantiate that States laws of adequate severity are in place that provide for effective sanctions. Please see supported evidence in references.

References:	1. https://www.gc.noaa.gov/documents/Penalty-Policy-FINAL-June242019.pdf 2. Alaska misdemeanor commercial fisheries penalties: http://www.touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05.htm 3. Alaska strict liability commercial fishing penalties: http://www.touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section722.htm

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**

9.4.4.2 Supporting Clause 11.2.

11.2.	**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 noncompliance with conservation and management measures.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑
EVIDENCE: The range of federal and state-levied sanctions includes fines, seizure and forfeiture of good, and, in criminal matters, incarceration. Examples of civil administrative and criminal case dispositions are included in Supporting Clause 10.1.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: The enforcement actions and subsequent disposition of the violations included in Supporting Clause 10.1 for FY 20 and FY 21 provide a representative cross-section of the enforcement activities of U.S. and State law enforcement agents. Compliance levels are reportedly high and the level of recidivism negligible.	
Evidence Basis: *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.*	☑
EVIDENCE: The availability and quality 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. Please see supported evidence on references.	

References:	1. Information provided in Supporting Clause 10.1.							
Numerical score:	**Starting score**			**Number of EPs NOT met**				**Overall score**
	10	**–**	**(**	**0**	**x**	**3**	**) =**	**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**

9.4.4.3 Supporting Clause 11.3.

11.3.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑
EVIDENCE: The level of IUU fishing within the Alaskan EEZ is not considered to be problematic. Enforcement presence and the availability and application of sanctions are considered appropriate to deter IUU fishing.		
Current status/Appropriateness/Effectiveness: *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.*		☑
EVIDENCE: U.S. sanctions are not designed to be an ineffective deterrence in the matter of IUU fishing. NOAA's penalty and sanctions policy (described previously) can be applied in the matter of IUU fishing. While IUU violations are infrequent, it is highly likely that sanctions would be of sufficient severity to effectively prevent, deter, and eliminate IUU fishing and to deprive offenders of the benefits accruing from such fishing. Sanctions would be applied transparently and consistently across the board.		
Evidence Basis: *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 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.*		☑
EVIDENCE: The 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.		
References:	The scoring is a reflection of the knowledge and experience of the assessment team.	

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):									**10**

9.4.4.4 Supporting Clause 11.4.

11.4.	**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.**	
Relevance:	Not relevant **Note:** Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ.	
	Not relevant since no foreign vessels are licensed to fish within the U.S. EEZ. U.S. vessels do not fish in the high seas or in another State's EEZ.	
Evaluation Parameters		**Met?**
Process: *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.*		☐
EVIDENCE:		
Current status/Appropriateness/Effectiveness: *There is evidence to substantiate enforcement action in these cases (i.e., boarding, violations).*		☐
EVIDENCE:		
Evidence Basis: *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.*		☐
EVIDENCE:		
References:		

Numerical score:	**Starting score**	–	(	**Number of EPs NOT met**	x	3	)	=	**Overall score**
	10								

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

9.5 Section D: Serious Impacts of the Fishery on the Ecosystem

9.5.1 Fundamental Clause 12. Impacts of the fishery on the ecosystem

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.

9.5.1.1 Supporting Clause 12.1.

12.1.	**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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑
EVIDENCE: Both policy and management explicitly recognize the influence of variable environmental conditions on halibut and sablefish stocks in Alaska. The influences of climatic, oceanographic, and ecological factors on Halibut and sablefish growth and survivorship are considered by IPHC, NPFMC, NOAA AKFSC during development of management fisheries plans.	
Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

The impacts of environmental factors on halibut and sablefish other fish or non-fish species associated or dependent upon them have been and are being appropriately assessed by the IPHC, NMFS/NPFMC and ADFG.

Sablefish

SAFE documents

Stock Assessment and Fishery Evaluation (SAFE) documents for BSAI and GOA sablefish summarize ecosystem considerations for the stocks. They include sections for 1) Ecosystem effects on the stock; and 2) Effects of the sablefish fishery on the ecosystem. Since 2003 SAFE documents for BSAI and GOA have also included an annual summary Ecosystem Assessment in the appendix. The primary intent of the assessment is to summarize historical climate and fishing effects of the shelf and slope regions of the eastern BSAI, and GOA, from an ecosystem perspective and to provide an assessment of the possible future effects of climate and fishing on ecosystem structure and function.

SAFE reports also describe results of first-order trophic interactions for sablefish from the ECOPATH model, an ecosystem modeling software package. While prominence of some interactions may be the result of insufficient data, estimation of prey interactions of adult sablefish in the GOA appears reasonable.

Ecosystem Considerations

The Resource Ecology and Ecosystem Management group at the Alaska Fishery Science Center (AFSC) provides up-to-date ecosystem information and assessments in annual Ecosystem Considerations documents. Since 1995, this document has been prepared in order to provide information about the effects of fishing from an ecosystem perspective, and the effects of environmental change on fish

12.1.	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.

stocks. Since 1999, the section has included information on indicators of ecosystem status and trends, and more ecosystem-based management performance measures. Ecosystems Considerations reviews sablefish stocks as part of the ground fish assessments.

FATE research

NOAA also supports the Fisheries and The Environment (FATE) program to ensure the sustainable use of US fishery resources under a changing climate. The focus of FATE is on the development, evaluation, and distribution of leading ecological and performance indicators. In 2010, FATE projects included a study to integrate environmental variables into sablefish recruitment and stock assessment models.

In the Path of the Polar Front: Reducing recruitment uncertainty through integration of large-scale climate indices within the Alaska sablefish stock assessment PSEIS ecosystem considerations. The Final Programmatic Supplemental Environmental Impact Statement for the Alaska Groundfish Fisheries (PSEIS) (NMFS 2004) provides information about effects of the fishery on the ecosystem and effects of the ecosystem on the groundfish fishery. It evaluates the historical effects of the spatial concentration of the state fishery and regime changes on sablefish stocks.

NOAA AKFSC compared long-term changes in Alaska Sablefish recruitment and growth with long-term changes in climate and stock size (Shotwell *et al*., 2014). It was found that environmental variability—both interdecadal and interannual—is responsible for most of the observed variation in Alaska Sablefish recruitment.

NMFS staff is currently doing research on the climate impacts of density-dependence and fishing on long-term and large-scale changes in recruitment, growth, maturity and distribution of Alaska Sablefish (Shotwell *et al*., 2014; Yasumichi *et al*., 2015; Hanselman *et al*., 2015). Scientists with the NMFS have conducted numerous studies and continue research on the impacts of acidification in the North Pacific Ocean. A research plan has been developed by the Alaska Fisheries Science Center focusing on forecasting fish, shellfish and coral population responses to ocean acidification in the north Pacific Ocean and Bering Sea. On an annual basis there is also a Stock Assessment and Fisheries Evaluation (SAFE) process that looks at a broad set of Ecosystem Considerations prior to the Council setting annual harvest rates and limits.

Additionally, the status of habitats and ecosystems are monitored within the broader framework of Alaska's large marine ecosystems and results are updated and published annually (e.g., Siddon, 2020; Ortiz and Zador, 2020). Collectively, these ecosystem assessments consider target stocks, associated or dependent species, and the relationship among populations in the ecosystem.

In 2018, the Council approved the Bering Sea Fisheries Ecosystem Plan (NPFMC, 2019), thereby formalizing its commitment to ecosystem-based fisheries management (EBFM) of the Bering Sea. The Council has acknowledged that moving toward EBFM is an ongoing process and as new information or tools become available the Council will respond by improving the fishery management program. The BS FEP will serve as a framework for continued incorporation of ecosystem goals and actions in regional management. The BS FEP sits alongside the Fishery Ecosystem Plan already developed for the Aleutian Islands (NPFMC, 2007) and it augments ongoing efforts for monitoring ecosystems in the Alaska Region (e.g., Siddon and Zador, 2019; Siddon, 2020).

<u>Halibut:</u>

IPHC has compared long-term changes in Pacific halibut recruitment and growth with long-term changes in climate and stock size215. IPHC scientists found that environmental variability—both interdecadal and interannual—is responsible for most of the observed variation in Pacific halibut recruitment. However, the dramatic decline in size at age, resulting in the large changes in growth rates that occurred during the twentieth century, appear to have been density-dependent responses to changes in stock size and competition with expanding flatfish stocks in general, with virtually no environmental influence (Martell *et al*., 2015).

Since 2009 the IPHC has deployed water column profilers at each of its survey stations, from the western Aleutian Islands to southern Oregon to assess environmental change in the ecosystem and effects on migration and recruitment of Pacific halibut.

IPHC staff is currently doing research on the climate impacts of density-dependence and fishing on long-term and large-scale changes in recruitment, growth, maturity and distribution of Pacific halibut (Martell *et al*., 2015). Scientists with the NMFS have conducted

12.1.	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.

numerous studies and continue research on the impacts of acidification in the North Pacific Ocean. A research plan has been developed by the Alaska Fisheries Science Center focusing on forecasting fish, shellfish and coral population responses to ocean acidification in the north Pacific Ocean and Bering Sea. On an annual basis there is also a Stock Assessment and Fisheries Evaluation (SAFE) process that looks at a broad set of Ecosystem Considerations prior to the Council setting annual harvest rates and limits219. Other research bodies carry out work to obtain information about the ecosystem, status and management of Pacific halibut and sablefish fisheries. Examples include:

North Pacific Research Board (NPRB)
The NPFB conducts research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean prioritizing on research efforts designed to address pressing fishery management or marine ecosystem information needs.

Bering Sea Integrated Ecosystem Research Program
The Bering Sea Integrated Ecosystem Research Program is a $52 million partnership between the NPRB and the National Science Foundation (NSF) that seeks to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. More than one hundred scientists are engaged in field research and ecosystem modeling to link climate, physical oceanography, plankton, fishes, seabirds, marine mammals, humans, traditional knowledge and economic outcomes to better understand the mechanisms that sustain this highly productive region.

The Gulf of Alaska Integrated Ecosystem Research Project (IERP)
The Gulf of Alaska Integrated Ecosystem Research Project (IERP) is a program of the NPRB that seeks to understand how environmental and anthropogenic processes, including climate change, affect trophic levels and dynamic linkages among trophic levels, with emphasis on fish and fisheries, marine mammals, and seabirds within the GOA. Implementation of the GOA IERP is structured around four separately completed components which will link together to form a fully integrated ecosystem study in the Gulf of Alaska. The four components of this program are:
Upper Trophic Level (UTL)
The overall goal of this component focuses on identifying and quantifying the major ecosystem processes that regulate recruitment strength of key groundfish species (arrowtooth flounder, Pacific cod, Pacific Ocean perch, sablefish, and walleye pollock) in the GOA. The focus is on a functional group of five predatory fish species that are commercially important and account for most of the predatory fish biomass in the GOA. Taken together they encompass a range of life history strategies and geographic distributions that provide contrast to explore regional ecosystem processes.

Forage Base
To focus on forage base and resources which influence the productivity of the top-level predator(s) chosen. The type, quality and quantity of food, and its timing and location, are critical to understanding higher trophic level responses.

Lower Trophic Level and Physical Oceanography
To focus on biological and physical oceanographic parameters on which this portion of the ecosystem is based. This includes euphausiids, fish eggs, and larval fishes.

Ecosystem Modeling
To describe and predict the responses (and variability therein) of this portion of the GOA ecosystem to environmental and anthropogenic processes, including climate change.

Also, the Pacific States Marine Fisheries Commission coordinates research activities, monitors fishing activities, collects and maintains databases on marine fish occurring off the California, Oregon, Washington, and Alaska coast.

Evidence Basis:	
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	☑

12.1.	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.
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.	

EVIDENCE:
See references cited above.

References:

Martell, S., B. Leaman, G. Kruse, K. Aydin, and K. Holsman. 2015. Fishery, Climate, and Ecological Effects on Pacific Halibut Size-at-age (SAA). North Pacific Research Board, Semi-annual Progress Report, July 2015.

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NPFMC, 2019. Bering Sea Fishery Ecosystem Plan. North Pacific Fishery Management Council. January 2019. 133p. https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf

NPFMC, 2021. NPFMC Research Priorities for 2022 - 2024. 19 p. https://www.npfmc.org/research-priorities/

Ortiz, I., and Zador, S. (Eds.) 2020. Ecosystem Status Report 2020 Aleutian Islands. Nov 17, 2020. https://www.fisheries.noaa.gov/alaska/ecosystems/ecosystem-status-reports-gulf-alaska-bering-sea-and-aleutian-islands

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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):	

9.5.1.2 Supporting Clause 12.2.

12.2.	**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 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.** **Note.** Clause 12.2 is a non-scoring clause with no associated Evaluation Parameters.

9.5.1.3 Supporting Clause 12.2.1.

12.2.1.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on main associated species (Appendix 1, Part 3 and 7), 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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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 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 nontarget 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.*	☑

EVIDENCE:

Processes for the detection of possibly harmful effects to nontarget catch/associated species taken in BSAI and GOA groundfish fisheries have been established by the Council, NMFS, and NOAA. Fishery management organizations have taken into account the associated species' most likely negative effects of BSAI and GOA groundfish fisheries (NMFS, 2004;). Through the NOAA observer program, fishery impacts on associated species are continuously observed, and possible repercussions are taken into account during annual stock assessment procedures (e.g., NPFMC 2020).

Additionally, monitoring procedures are in place to make sure that groundfish fisheries do not have any potential negative effects on nontarget species. For BSAI and GOA groundfish fisheries, NOAA implements an observer program (NOAA 2019) . NOAA maintains an observer database that contains information on non-target captures, including discards of target stocks. The authors of stock assessments get observer data on a regular basis, and they include this data in their annual stock evaluations.

Current status/Appropriateness/Effectiveness: *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 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.*	☑

EVIDENCE:

Fishery management organizations have taken into account the associated species' most likely negative effects of BSAI and GOA groundfish fisheries (NMFS, 2004;). Through the NOAA observer program, fishery impacts on associated species are continuously observed, and possible repercussions are taken into account during annual stock assessment procedures (e.g., NPFMC 2020).

For the purposes of the present assessment, however, it was necessary to look more closely at the bycatch data in order to identify breakpoints at 80% and 95% levels in the 'bycatch species profile' (BSP). This was done to comply with RFM guidance Part 3, Appendix 1, of the RFM Standard Version 2.1 which requires the assessment team to use the BSP to distinguish main and minor associated species. Observer data summaries were provided by NOAA Regional Office covering the 3 most recent years 2019-2021 for which data were available (Mary Furuness, NOAA Regional office.). Table 22and Table 23 summarizes main and minor associated species for Hook and Line (HAL) and for pot sablefish/halibut fisheries. These data support the conclusion that the main associated species

12.2.1.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on main associated species (Appendix 1, Part 3 and 7), 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.**

in the Sablefish and halibut targeted Hook and Line (HAL) fishery consisted of members of shark and skate complex. As for the species composition in Sablefish and halibut targeted Pot fishery there were no main associated species.

Table 22. Summary data for main and minor associated species in Alaska Sablefish and halibut Hook and Line (HAL) targeted fishery 2019-2021 in metric tons. Blank cells in the Classification column equals negligible amounts.

Classification	Species Composition	Average 2019-2021	Percentage
Target	Halibut	5138.62	42.91
Target	Sablefish	3441.78	28.74
Main	Sharks	761.25	6.36
Main	Other skates	563.64	4.71
Minor	Pacific cod	479.90	4.01
Minor	Longnose skate	389.67	3.25
Minor	Big Skate	245.42	2.05
Minor	Shortraker rockfish	199.80	1.67
Minor	Thornyhead rockfish	152.98	1.28
Minor	Other Rockfish	152.42	1.27
Minor	Blackspotted/rougheye rockfish	123.97	1.04
Minor	Arrowtooth flounder	115.26	0.96
	Sculpins	112.90	0.94
	Demersal shelf rockfish	60.66	0.51
	Octopus	11.89	0.10
	Pollock	8.12	0.07
	Deep water flatfish	5.24	0.04
	Shallow water flatfish	3.71	0.03
	Kamchatka Flounder	3.29	0.03
	Dusky Rockfish	1.82	0.02
	Greenland Turbot	1.02	0.01
	Flathead sole	0.59	0.00
	Other flatfish	0.50	0.00
	Rock Sole	0.41	0.00
	Pacific Ocean perch	0.24	0.00
	Northern rockfish	0.23	0.00
	Rex sole	0.14	0.00
	Atka mackerel	0.14	0.00
	Yellowfin sole	0.07	0.00
	Alaska plaice	0.00	0.00
Total		3395.29	100.00

Table 23. Summary data for main and minor associated species in Alaska Sablefish and halibut pot targeted fishery 2019-2021 in metric tons. Blank cells in the Classification column equals negligible amounts.

Classification	Species Composition	Average 2019-2021	Percentage
Target	Sablefish	3488.02	95.90
	Arrowtooth flounder	84.93	2.34
Target	Halibut	22.26	0.61
	Pacific Cod	9.93	0.27
	Blackspotted/rougheye rockfish	8.00	0.22
	Shortraker rockfish	4.48	0.12
	Sharks	3.15	0.09
	Deep water flatfish	2.98	0.08
	Kamchatka flounder	2.65	0.07
	Thornyhead rockfish	2.53	0.07
	Shallow water flatfish	1.74	0.05
	Other rockfish	1.71	0.05
	Octopus	1.70	0.05
	Greenland turbot	1.57	0.04
	Demersal shelf rockfish	0.47	0.01
	Rock sole	0.41	0.01
	Rex sole	0.20	0.01
	Longnose skate	0.15	0.00
	Sculpins	0.09	0.00
	Yellowfin sole	0.08	0.00
	Other skates	0.05	0.00
	Dusky rockfish	0.05	0.00
	Pollock	0.04	0.00
	Flathead sole	0.03	0.00
	Other flatfish	0.03	0.00
	Atka mackerel	0.02	0.00
	Big skate	0.01	0.00
	Northern rockfish	0.01	0.00
	Pacific Ocean perch	0.01	0.00
	Alaska plaice	0.00	0.00
Total		3637.28	100.00

MAIN SPECIES on Hook and Line fishery targeting Halibut and Sablefish

Shark complex (spiny dogfish, Pacific sleeper, salmon shark, other/unidentified sharks).

The spiny dogfish, Pacific sleeper shark, and salmon shark are the most common shark species that interact with the longline fishery in the BSAI and GOA.

Spiny Dogfish: *Squalus acanthias*, is found from the Bering Sea and the GOA to Baja California, Mexico. They have an 80-year lifespan, and adults only grow 2.5 to 3.5 feet long on average. Males reach sexual maturity at an average age of 19, whereas females do so at 35, and both sexes give birth to up to 22 pups in shallow bays. As opportunistic feeders the spiny dogfish consume whatever available prey. They mostly consume tiny, schooling pelagic fish like herring as well as tiny crustaceans like shrimp, crab, and squid (NOAA Fisheries, 2020).

Pacific sleeping shark: *Somniosus pacificus*, has a distribution range in the North Pacific that extends from Japan to southern California and Baja California, Mexico, via the Siberian coast and the Bering Sea. They can be found in the Chukchi Sea, Bering Sea, Aleutian Islands, and Gulf of Alaska's continental shelf and slope. For females, it exceeds 365 cm, while for males, it exceeds 397 cm.

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Concerning their reproduction, little is known. According to tagging studies, they travel just a small amount geographically (around 100 km/yr). They consume crab, flatfish, rockfish, pollock, seals, and other invertebrate species in addition to cetaceans and seals.

Salmon shark: *Lamna ditropis*, is one of the five species in the Lamnidae family, is a near relative of the Atlantic and Southern Pacific porbeagle sharks (*Lamna nasus*). There are salmon sharks known to exist at 668 m of depth. A coastal-littoral and pelagic shark, the salmon shark can be found near to shore and just off beaches. They can be found by themselves, in fleets, or in large groups, especially during thick salmon and schooling fish runs. From California to Alaska and as far west as the Aleutian Islands and the Sea of Japan, salmon sharks can be found along the West Coast of the United States. Male salmon sharks mature a few years earlier than females, who take roughly 10 to 12 years to reach adulthood. It has been confirmed that adult salmon sharks can grow to approximately 10 feet in length and weigh several hundred pounds, with males being somewhat smaller and lighter in build. Lamnid sharks, like other high-performance open-ocean predators like tunas and swordfish, have a special capacity to maintain increased body temperatures in comparison to ambient water temperatures (Pelagic Shark Research Foundation, 2020).

Status of Shark complex in BSAI[10]

Spawning biomass and stock trends

The main shark species taken in the BSAI fisheries (mainly pollock and Pacific cod) are Pacific sleeper sharks and salmon sharks. Beginning around 2000, catch rates of sleeper sharks in both the IPHC longline survey and the bycatch fisheries declined steeply for several years, causing possible concern about depletion. In 2017, the IPHC RPN showed a slight increase, which was the first increase in a decade. All sleeper sharks taken in the survey and fisheries are likely juveniles, so it is impossible to know what effect those catches have on spawning stock biomass. Bycatch of salmon sharks has generally increased since 2010. Recent catch levels have been well below the ABC.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has placed sharks in Tier 6, where OFL and ABC are typically based on historical catches. The OFL is fixed at the maximum catch during 2003–2015 (689 t) and ABC at 75% of OFL, 517 t.

Status determination

The shark complex is not being subjected to overfishing. It is not possible to determine whether this species complex is overfished or whether it is approaching an overfished condition because it is managed under Tier 6.

Status of Shark complex in GOA[11]

Spawning biomass and stock trends

There was a decline in spiny dogfish biomass in the 2019 trawl survey, this model is based on random effects to smooth the time series from the trawl survey biomass. Tier 6 shark recommendations are determined by average historical catches from 1997-2007, which did not change for this assessment.

Tier determination/Plan Team discussion and resulting ABC and OFL recommendations.

For ABC/OFL estimates, spiny dogfish have been elevated to Tier 5, while the other components remain in Tier 6. The total OFL for the GOA shark complex is the sum of the Tier 5 and Tier 6 recommendations for each species. The recommended ABC is 3,755 t and OFL is 5,006 t for the shark complex. This is a 54% decrease from the 2020 ABC of 8,184 t.

[10] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/BSAIintro.pdf

[11] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAintro.pdf

12.2.1.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on main associated species (Appendix 1, Part 3 and 7), 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.**

Status determination
Sharks are caught incidentally in other target fisheries. There are currently no directed commercial fisheries for shark species in federally or state managed waters of the GOA, and most incidental catch is discarded. There were insufficient data to determine if the shark complex is in an overfished condition, but the complex is not currently being subjected to overfishing. There is no evidence to suggest that overfishing is occurring for any shark species in the GOA because the OFL has not been exceeded.

Skates
Skates of all kinds are caught and discarded in the ocean. Skate life cycles are comparable to those of sharks, with relatively low reproduction, slow growth to large body sizes, and reliance on high survival rates of a few number of well-developed young for population stability (Moyle and Cech 1996). Alaskan skates in the BSAI and big and longnose skates in the GOA are the two main types of skates captured in the Hook and Line (HAL) fishery (Ormseth 2014; 2014b).

From the Bering Sea to southern Baja California, the big skate can be found in depths between 2 and 800 meters. Similar geographic ranges for the longnose skate are found from the southeast Bering Sea to Baja California in depths of 9 to 1,069 meters (Love *et al*., 2005). Although the depth range for these two species is considerable, they are often found in shallow seas in the Gulf of Alaska. The GOA longnose skate has a maximum observed age of 25 years, according to recent data from the AFSC Age and Growth Program. The maximum observed age for GOA big skates in the same study was 15 years. GOA skates seemed to be generalists, devouring a variety of commercially significant species of the locally plentiful invertebrates and fish (e.g., pandalid shrimps, tanner crabs, gadids, flatfishes). The assessed skate assemblage may have a significant impact on trophic dynamics and management of demersal marine habitats in the Gulf of Alaska as common benthic predators and competitor with other groundfish (Ebert *et al*., 2008).

Since species identification became reliable in 1999, the Alaska skate, which is widespread throughout the EBS shelf habitat area and is most frequently seen at depths of 50 to 200 m, has been estimated to provide between 91% and 97% of total skate biomass (Ormseth 2014b). Males were 9 years old and 92 cm tall at 50% maturity, while females were 10 years old and 93 cm tall. Skates live in the BSAI FMP area as predators. Others only consume benthic invertebrates, while at least three species—the deep-sea skate, the roughtail skate, and the longnose skate—are benthophagic as juveniles but turn piscivorous as they get bigger (Ebert 2003, Robinson 2006). The predominantly pollock-eating Alaska skate (as do most other piscivorous animals in the EBS). The food web shows that cod and halibut are both predators and prey of EBS skates, and that sperm whales constitute the majority of the other "predators" of these skates.

As part of the HAL fisheries, a wide variety of skates are caught and discarded at sea. The category "skates: other" in the BSAI, which largely includes Alaska skates, accounts for around 4.71% of the total observed HAL catch. Longnose and big skates are recorded separately in the GOA and account for around 3.25 and 2.05% of the catch, respectively.

Skate fishing is not permitted under the GOA. Skates are deemed to be "in the fishery" and harvest guidelines are necessary since incidental catches in other fisheries are so prevalent. Three units make up the GOA Skate Complex. Longnose skate and big skate have different harvest requirements, and each GOA regulatory area is subject to Gulf-wide overfishing levels (OFLs) and Acceptable Biological Catches (ABCs) restrictions.

When complete survey data from the trawl fishery are available, complete evaluations for the BSAI and GOA skate complexes are carried out in even years. The assessments contain the most recent biomass and catch data during the off years. Both fisheries dependent and fishery independent procedures, such as the fishery independent surveys, the catch accounting system, and the observer program, are used to gather data on the status of skate species' stocks.

A single set of harvest requirements are used for the entire BSAI skating complex, which is managed collectively. However, the stock is split into two sections to provide the harvest recommendations. Using the findings of an age-structured model and Tier 3, harvest

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recommendations are made for Alaska skate, the most prevalent skate species in the BSAI. Due to a lack of data, the remaining species (sometimes known as "other skates") are handled under Tier 5. To create suggestions for the complex as a whole, the Tier 3 and Tier 5 recommendations are integrated (Ormseth, 2019a).

Skate directed fishing is not permitted in the GOA, and there are no target skate fisheries at the moment. Skates are deemed to be "in the fishery" and harvest guidelines are necessary since incidental catches in other fisheries are so prevalent. Three units make up the GOA Skate Complex. Big skate and longnose skate have different harvest requirements, and each GOA regulatory area is given Gulf-wide overfishing levels (OFLs) and Acceptable Biological Catches (ABCs) limits (western [WGOA], central [CGOA], and eastern [EGOA]). The management of the remaining skate species falls under the "other skates" group, which has Gulf-wide harvest guidelines. Under Tier 5, which bases OFL and ABC on survey biomass estimates and natural death rates, all GOA skates are regulated. The maximum retainable amount for all skaters in the GOA was cut from 20% to 5% with effect from January 27, 2016, according to NOAA's Alaska Regional Office (Ormseth, 2019b).

Status of Skates in BSAI[12]

Spawning biomass and stock trends

Last year's assessment estimated that recruitment of Alaska skate was above average for all but 2 cohorts spawned between 1995 and 2011, but has been below average for all cohorts spawned since 2012. Spawning biomass of Alaska skate increased continuously from 2006 (198,418 t) through 2020 (284,268 t), and in 2020 was at an all-time high for the post-1976 environmental regime. With lower recent recruitment, spawning biomass is expected to decrease in the future. The biomass of Other Skates on the EBS shelf is declining but is still above the long-term mean.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

Since 2011, the Alaska skate portions of the ABC and OFL have been specified under Tier 3, while the "other skates" portions have been specified under Tier 5.

Because projected spawning biomass for 2022 (121,575 t) exceeds B40% (71,370 t), Alaska skates are managed in sub-tier "a" of Tier 3. Other reference points are maxFABC = F40% = 0.079 and FOFL = F35% = 0.092. The Alaska skate portions of the 2022 and 2023 ABCs are 31,920 t and 30,786 t, respectively, and the Alaska skate portions of the 2022 and 2023 OFLs are 37,073 t and 35,758 t. The "other skates" component is assessed under Tier 5, based on a natural mortality rate of 0.10 and a biomass estimated using the random effects model. The "other skates" portion of the 2022 and 2023 ABCs is 8,038 t for both years and the "other skates" portion of the 2022 and 2023 OFLs is 10,717 t for both years.

For the skate complex as a whole, ABCs for 2022 and 2023 total 39,958 t and 38,824 t, respectively, and OFLs for 2022 and 2023 total 47,790 t and 46,475 t, respectively.

Status determination

Alaska skate, which may be viewed as an indicator stock for the complex, is not overfished and is not approaching an overfished condition. The skate complex is not being subjected to overfishing.

Status of GOA Skates[13]

Spawning biomass and stock trends

Big skate survey biomass from the AFSC BTS decreased relative to 2019 based on new survey estimates while the longnose skate survey biomass increased. The biomass of the other skates increased but there is still a continued decline from a peak in 2013. The

[12] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/BSAIintro.pdf
[13] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAintro.pdf

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additional survey information supports a conclusion of a substantial decline in Bathyraga skate biomass since 2009. The current biomass level is like the 1990s. Smaller big skates seem to inhabit the EGOA and larger big skates in WGOA indicating movement through their life stages.

Tier determination/Plan Team discussion and resulting ABCs and OFLs
Skates are managed in Tier 5. Applying M=0.1 and 0.75M to the estimated biomass from the random effects models for each stock component gives stock specific OFLs and ABCs. The Team concurred with the author's recommendations.

Status determination
Catch as currently estimated does not exceed any GOA-wide OFLs, and therefore, none of the skate stocks are subject to overfishing. It is not possible to determine the status of stocks in Tier 5 with respect to overfished status

MAIN SPECIES on POT fishery targeting Halibut and Sablefish
There were no main species in the Pot fishery targeting Halibut and Sablefish.

Evidence Basis: *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 reversible. If such impacts arise, effective remedial action is taken. Examples may include various stock and ecosystems assessment reports.*	☑

EVIDENCE:
In addition to the references cited above, the following datasets and/or reports substantiate adequate consideration of UoC impacts on main associated species:
- Detailed observations on catch composition from mandatory NOAA observer program
- Annual Groundfish SAFE reports

References:	Ebert, David. (2003). Sharks, Rays, Chimaeras of California. Ormseth, O.A. (2019a). Partial assessment of the skate stock complex in the Bering Sea and Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://archive.afsc.noaa.gov/refm/docs/2019/BSAIskate.pdf Ormseth, O.A. (2019b). Assessment of the skate stock complex in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://archive.afsc.noaa.gov/refm/docs/2019/GOAskate.pdf

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):	

9.5.1.4 Supporting Clause 12.2.2.

12.2.2.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species (Appendix 1, Part 3 and 7), 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.**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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.*	☑
EVIDENCE: The Council, NMFS, and ADF&G have created procedures for identifying possibly harmful effects to nontarget catch/associated species taken in groundfish fisheries, as mentioned in Supporting Clause 12.2.1. Additionally, systems for monitoring are in place to make sure that potential negative effects on nontarget catches or associated species do not occur in the groundfish fisheries of the BSAI and GOA. The BSAI and GOA groundfish fisheries have an observer program in place. The NOAA observer database keeps track of non-target catches, including discards of target stocks and stocks other than the "stock under consideration." The authors of stock assessments get observer program results on a regular basis, and they include this data in their annual stock evaluations.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: As noted in Supporting Clause 12.2.1, new RFM guidance (Part 3, Appendix 1, of the RFM Standard Version 2.1) requires the assessment team to use data on a fishery's Bycatch Species Profile (BSP) to distinguish main and minor associated species. Breakpoints for main associated species (at 80% of total bycatch) were presented in SC 12.2.1. Minor associated species, i.e. those taxa between the thresholds at 80% and 95% of bycatch, are discussed here. **Minor associated species for Sablefish/Halibut targeted longline fishery include the following taxa/categories** • Pacific Cod • Longnose skate • Big Skate • Shortraker Rockfish • Thornyhead Rockfish • Other Rockfish	

12.2.2. The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species (Appendix 1, Part 3 and 7), 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.

- Blackspotted/rougheye Rockfish
- Arrowtooth flounder

Species: Pacific cod

Pacific cod: *Gadus macrocephalus,* is generally found on the continental shelf and upper slope and is distributed at depths from shoreline to 500 m. Pacific cod has a wide distribution over the BSAI and GOA areas. Management of Pacific cod is under two Fishery Management Plans: one for the Bering Sea/Aleutian Islands region and the other for the Gulf of Alaska region. Stock status of Pacific cod species information is collected through both fishery dependent and fishery independent mechanisms, including the fishery independent surveys, catch accounting system, and observer program. The species is managed as a Tier 5 species.

Status of Pacific Cod in BSAI[14]

Eastern Pacific Cod

Spawning biomass and stock trends

Recruitment is estimated to have been below average for the 2014-2017-year classes. Above average recruitment is estimated for the 2018 year class. Estimated spawning biomass from the ensemble increased from 2010 through 2019 to 315,000 t and declined to 255,000 t in 2021. Spawning biomass is predicted to increase to 260,000 t in 2022 with the recommended ABC. Tier determination/Plan Team discussion and resulting ABCs and OFLs.

This stock is assigned to Tier 3b for the determination of 2022 and 2023 ABCs and OFLs. The 2022 maxABC in this tier as calculated using the weighted average of the models in the ensemble is 153,383 t and the projected 2023 maxABC is 151,709 t. The 2022 OFL from the weighted ensemble is 183,012 t. The 2023 projected OFL, given the respective 2022 catch from each individual model, is 180,909 t. Even though a slightly elevated risk to the stock was identified due to environmental/ecosystem considerations, the Team did not recommend a reduction in the ABC.

Status determination

EBS Pacific cod is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition

Aleutian Pacific Cod

Spawning biomass and stock trends

After declining by more than 50% between 1991 and 2002, survey biomass has since stayed in the range of 50-90 kilotons. The 2018 Aleutians survey biomass estimate (81,272 t) was down approximately 4% from the 2016 estimate (84,409 t). No Aleutian Island surveys for Pacific cod have been conducted since 2018.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The Team recommends using the Tier 5 assessment again for setting 2022 and 2023 harvest specifications. The Team's recommended ABC is 20,600 t, and OFL is 27,400 t. The estimate of the natural mortality rate is 0.34, which is unchanged from the previous assessment.

Status determination

This stock is not being subjected to overfishing. It is not possible to determine whether this stock is overfished or whether it is approaching an overfished condition because it is managed under Tier 5.

[14] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/BSAIintro.pdf

12.2.2.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species (Appendix 1, Part 3 and 7), 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.**

GOA Pacific Cod[15]

Spawning biomass and stock trends

The B40% estimate was 64,970 t, with projected 2022 spawning biomass of 39,873 t. Spawning biomass is projected to slightly decrease from 2022 to 2023.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

Based on previous classification of this stock being in Tier 3, the 2022 spawning biomass was projected to be below B40% and would therefore be classified as Tier 3b. The FOFL and FABC values are 0.54 and 0.44, respectively. The maximum permissible ABC is 24,043 t. The recommended ABC is a 1.76% increase from the 2021 ABC of 23,627 t.

Status determination

The stock is not being subjected to overfishing and is neither overfished nor approaching an overfished condition.

Shortraker Rockfish

Shortraker: *Sebaster borealis*, is a groundfish belonging to the family Scorpanenidae. This species is distributed along the continental slope in the north Pacific from Point Conception in southern California to Japan. Characteristics of rockfishes including fidelity to localized habitats, slow growth, late maturation, and remarkably long-life spans. The shortraker stock is classified as a Tier 5 stock.

Status of shortraker rockfish in BSAI[16]

Spawning biomass and stock trends

Estimated shortraker rockfish biomass in the BSAI has been relatively stable since 2002. Increases in the 2018 AI survey biomass estimates occurred in the western and eastern AI with a decrease in the central AI. According to the random effects model, total biomass (AI and EBS slope combined) from 2002-2018 has been very stable. The time series from the random effects model is much smoother than the time series for the raw data, due to large standard errors associated with the survey biomass estimates. Exploitation rates have generally been well below the ABC levels in all areas, except for the western area, where exploitation rates exceeded the ABC levels from 2011-2013.

Tier determination/Plan Team discussion and resulting ABCs and OFLs

The SSC has previously determined that reliable estimates of only biomass and natural mortality exist for shortraker rockfish, qualifying the species for management under Tier 5. The Team recommends basing the biomass estimate on the random effects model. The Team recommended setting FABC at the maximum permissible level under Tier 5, which is 75% of M. The accepted value of M for this stock is 0.03 for shortraker rockfish, resulting in a maxFABC value of 0.0225. The ABC is 541 t for 2021 and 2022 and the OFL is 722 t for 2021 and 2022.

Status determination

Shortraker rockfish is not being subjected to overfishing. It is not possible to determine whether this stock is overfished or whether it is approaching an overfished condition because it is managed under Tier 5.

<u>Status of shortraker rockfish in GOA</u>

Spawning biomass and stock trends

Applying the random effects model to trawl survey data from 1984–2021 and the longline survey RPW indices resulted in a 2022 biomass estimate of 31,331 t for shortraker rockfish, almost equivalent to the previous estimate (31,465 t).

[15] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAintro.pdf
[16] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/BSAIintro.pdf

12.2.2.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species (Appendix 1, Part 3 and 7), 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.**

Tier determination/Plan Team discussion and resulting ABCs and OFLs
Shortraker rockfish are Tier 5 species for specifications where FABC = 0.75M = 0.0225, and FOFL = 0.03; applying this definition to the biomass results in an OFL 940 t and an ABC of 705 t for 2022.

Status determination
Available data are insufficient to determine stock status relative to overfished criteria. This stock was not being subjected to overfishing in 2021.

Thornyhead Rockfish
Groundfish called thornyheads (*Sebastolobus* spp.) are members of the Scorpanenidae family, which also includes rockfish. Thornyheads are found throughout the north Pacific in deep water environments. Due to the lack of age data required for age-structured assessment models, NOAA classifies the Thornyhead Complex as a Tier 5 stock. The complex is subject to a biennial stock assessment schedule, with full stock assessments performed in even years and no stock assessments produced in odd years. The complex of thornyhead species does not currently have a directed fishery, however they are frequently captured and kept as part of the groundfish trawl and HAL fisheries. Despite being one of the most lucrative rockfish species, thornyheads are still regulated in the BSAI and GOA as "bycatch only," and they are not the subject of a guided fishery (Echave and Hulson, 2018).

Status of Thornyhead in BSAI[17]
Spawning biomass and stock trends
This is a Tier 5 complex, thus trends in spawning biomass are unknown. The random effects survey biomass estimates for shortspine thornyhead (SST) in the Aleutian Islands and EBS slope have been variable. The non-SST portion of the complex varies dramatically among surveys, although there was no survey this year. Biomass estimates are frequently zero or very small for the non-SST portion of the complex in both the eastern Bering Sea slope and shelf surveys.

Tier determination/Plan Team discussion and resulting ABCs and OFLs
The Team agrees with the approach recommended by the author of setting FABC at the maximum allowable under Tier 5 (FABC = 0.75M). The accepted values of M for species in this complex are 0.03 for SST and 0.09 for all other species. Multiplying these rates by the best biomass estimates of shortspine thornyhead and the non-SST portion of the complex yields 2021 and 2022 ABCs of 919 t in the eastern Bering Sea and 394 t in the Aleutian Islands. The Team recommends that OFL be set for the entire BSAI area, which under Tier 5 is calculated by multiplying the best estimates of total biomass for the area by the separate natural mortality values and adding the results, yielding an OFL of 1,751 t for 2021 and 2022.

Status determination
The “Thornyhead rockfish” complex is not being subjected to overfishing. It is not possible to determine whether this complex is overfished or whether it is approaching an overfished condition because it is managed under Tier 5.

Status of Thorny head in GOA[18]
Spawning biomass and stock trends
Estimates of spawning biomass are unavailable for thornyheads. The most recent 2019 trawl survey estimate was 4% lower than the 2017 estimate, whereas the longline survey RPW increased 15% between 2018 and 2019, and then decreased by 27% in 2020. The thornyhead complex is a Tier 5 stock, and biomass is estimated by applying the random effects method to the trawl and longline survey biomass time series by region and depth in order to compensate for missing data (i.e., thornyheads are found down to 1000m,

[17] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/BSAIintro.pdf
[18] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAintro.pdf

12.2.2.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species (Appendix 1, Part 3 and 7), 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.**

but deep survey strata are not sampled in in each trawl survey). The biomass estimates from the random effects model show a slightly increasing trend from 2010–2019 and a projected stable trend after 2020.

Tier determination/Plan Team discussion and resulting ABCs and OFLs
The Plan Team concurred with the authors' recommendations for ABC and OFL for 2021 and 2022. Gulf-wide catch of thornyheads in 2019 was 39% of the ABC.

Status determination
The thornyhead complex is not being subjected to overfishing. Information is insufficient to determine stock status relative to overfished criteria as estimates of spawning biomass are unavailable

Arrowtooth flounder
Arrowtooth flounder is a relatively large flatfish and one of the most abundant fish in the Gulf of Alaska. It plays an important role in Alaska's complex marine food chain. It feeds extensively on the commercially important walleye pollock. In turn, they are food for Alaska Steller sea lions, making up almost 35% of their diet. Though the population can be found as far south as central California, it is known to spawn in Alaskan waters and the eastern Bering Sea from December through February.

Status of Arrowtooth flounder in BSAI[19]
Spawning biomass and stock trends
The projected age 1+ total biomass for 2022 is 921,690 t, which is roughly the same as the 921,074 t projected for 2022 in last year's assessment. The projected female spawning biomass for 2022 is 509,672 t, which is a slight increase from last year's 2022 estimate of 509,208 t. Overall stock trends remain fairly stable.

Tier determination/Plan Team discussion and resulting ABCs and OFLs
The SSC has determined that reliable estimates of B40%, F40%, and F35% exist for this stock. Arrowtooth flounder therefore qualifies for management under Tier 3. The point estimates of B40% and F40% from this year's assessment are 223,530 t and 0.135. The projected 2022 spawning biomass is well above B40%, so ABC and OFL recommendations for 2022 were calculated under sub-tier "a" of Tier 3. The authors recommend setting FABC at the F40% level, which is the maximum permissible level under Tier 3a, resulting in 2022 and 2023 ABCs of 80,389 t and 83,389 t, respectively. Projected harvesting at F35% (0.160) gives 2022 and 2023 OFLs of 94,445 t and 97,944 t respectively.

Status determination
Arrowtooth flounder is a lightly exploited stock in the BSAI. Arrowtooth flounder is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

Status of Arrowtooth flounder in GOA[20]
Spawning biomass and stock trends
Arrowtooth flounder biomass estimates have been decreasing since 2008. The trend in spawning biomass increased from about 725,000 t in 1977 to over 1.1 t by 2008. Since then, the spawning biomass estimate decreased to about 731,000 t in 2021. The largest estimated age-1 recruitment occurred in 2000 (1.7 billion) but has been below average since 2007. However, the 2017-year class appears to be above the longer-term mean. The projected spawning biomass for 2022 was 703,853 t, down 3% from last year's projection for 2022.

[19] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/BSAIintro.pdf
[20] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAintro.pdf

12.2.2.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species (Appendix 1, Part 3 and 7), 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.**

Tier determination/Plan Team discussion and resulting ABCs and OFLs
Arrowtooth flounder is estimated to be in Tier 3a, and the Team accepted the recommended ABC and OFL. Consistent with decreasing spawning biomass and updated reference fishing mortality rates, the 2022 ABC was 6% lower than the estimate from the 2021 projected value.

Status determination
This stock is not being subjected to overfishing and is neither overfished nor approaching an overfished condition

Blackspotted/Rougheye rockfish complex
Rockfish called rougheye (*Sebastes aleutianus*) and blackspotted (*S. melanostictus*) live in the northeastern Pacific's upper continental slope and outer continental shelf. Their range include the Bering Sea and the North Pacific arc from Japan to Point Conception, California (Kramer and O'Connell, 1988). The two species coexist in a sympatric range, with blackspotted expanding into the western Aleutian Islands and rougheye reaching further south along the Pacific Rim (Orr and Hawkins 2008). The two species' ranges overlap quite a bit, mostly from southeast Alaska into the Alaska Peninsula (Gharrett *et al*., 2005; Orr and Hawkins 2008). Both species seem to be most prevalent in Alaskan waters, especially the eastern Gulf of Alaska (GOA). Adults in the GOA are restricted to a small area along the upper continental slope at depths of 300–500 m; their abundance declines sharply beyond this range (Ito, 1999). Along with shortraker rockfish (Sebastes borealis), these species coexist often.

Rougheye and blackspotted (RE/BS) rockfish appear to be K-selected with late maturity, sluggish development, extraordinary longevity, and low natural mortality, despite the fact that virtually little is known about their biology and life history. The RE/BS rockfish are ovoviviparous, like other Sebastes species, which means that the embryos receive at least some maternal nutrition during internal egg fertilization and incubation. Studies on the RE/BS fecundity in Alaska are lacking. According to one study on the reproductive biology of rougheye, parturition (larval release) may occur between the months of December and April (McDermott 1994). It is unknown whether or when males inseminate females or if spawning/breeding migrations take place. The larval stage is pelagic, but studies on larvae are hampered since, as of right now, the only reliable method for positively identifying larvae is through labor-intensive genetic analysis. Additionally, it appears that the post-larvae and early young-of-the-year stages are pelagic (Matarese *et al*., 1989, Gharrett *et al*., 2002). The only evidence of habitat preference for this life stage comes from the recent application of genetic tools to identify post-larval RE/BS rockfish from opportunistically collected samples in epipelagic waters far offshore in the Gulf of Alaska.

Status of Blackspotted/rougheye rockfish in BSAI[21]
Spawning biomass and stock trends
Spawning biomass for AI blackspotted and rougheye rockfish in 2022 is projected to be 3,468 t and is projected to increase slightly in 2023.

Tier determination/Plan Team discussion and resulting ABCs and OFLs
The stock assessment is separated into AI and EBS. For the AI, this stock qualifies for management under Tier 3 due to the availability of estimates for *B40%*, *F40%*, and *F35%*. Because the projected female spawning biomass for 2022 of 3,468 t is less than *B40%* (3,524 t), the stock qualifies as Tier 3b but is projected to slightly exceed *B40%* in 2023 (3,568 t). For the EBS, this stock is managed under Tier 5 with a projected biomass for both 2022 and 2023 of 1,371 t.

The authors and Team recommend an overall 2022 ABC of 503 t and a 2022 OFL of 598 t. The apportionment of the 2022 ABC to subareas is 177 t for the Western and Central AI and 326 t for the Eastern AI and EBS
Status determination

[21] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/BSAIintro.pdf

12.2.2.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species (Appendix 1, Part 3 and 7), 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.**

The BSAI blackspotted and rougheye stock complex is not being subjected to overfishing. For the AI region, the blackspotted and rougheye rockfish complex is not overfished, and is not approaching an overfished condition. It is not possible to determine whether the complex in the EBS region is overfished or whether it is approaching an overfished condition because it is managed under Tier 5.

Status of Blackspotted/rougheye rockfish in GOA[22]
Spawning biomass and stock status trends
Estimated female spawning biomass for 2022 is 8,648 t. This is above the B40% value of 5,911 t.

Tier determination/Plan Team discussion and resulting ABCs and OFLs
The rougheye/blackspotted complex qualifies as a Tier 3 stock. For 2022 and 2023, the Plan Team accepted the authors' recommended maximum permissible ABCs and the OFLs as provided in the table above.

Status determination
The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished.

<u>Minor associated species for Sablefish/Halibut targeted pot fishery include the following taxa/categories</u>
There were no minor associated species on the Sablefish/Halibut pot fishery.

Evidence Basis: *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 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.*	☑

EVIDENCE:
In addition to the references cited above, the following datasets and/or reports substantiate adequate consideration of UoC impacts on minor associated species:
- Detailed observations on catch composition from NOAA observer program
- Annual Groundfish SAFE reports

References:

Echave, K. B., and P.-J. F. Hulson. 2018. Assessment of the Thornyhead stock complex in the Gulf of Alaska. In Stock assessment and fishery evaluation report for the groundfish resources of the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, Alaska.

Gharrett, A.J., Z. Li, C.M. Kondzela, and A.W. Kendall. 2002. Final report: species of rockfish (Sebastes spp.) collected during ABL-OCC cruises in the GOA in 1998-2002. (Unpubl. manuscr. available from the NMFS Auke Bay Laboratory, 11305 Glacier Hwy., Juneau AK 99801).

Gharrett, A.J., A.P. Matala, E.L. Peterson, A.K. Gray, Z. Li, and J. Heifetz. 2005. Two genetically distinct forms of rougheye rockfish are different species. Transactions. American. Fisheries. Society. 132:242-260.

Kramer, D.E., and V.M. O'Connell. 1988. A Guide to Northeast Pacific Rockfishes: Genera Sebastes and Sebastolobus. In: Alaska Sea Grant Advisory Bulletin, 25. In National Marine Fisheries Service 2001(a).

McDermott, S.F. 1994. Reproductive biology of rougheye and shortraker rockfish, *Sebastes aleutianus* and *Sebastes borealis*. Master's thesis. University of Washington, Seattle 76 pp

[22] https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAintro.pdf

12.2.2.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species (Appendix 1, Part 3 and 7), 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.**									
	Matarese, A.C., A.W. Kendall, Jr., D.M. Blood, and B.M. Vinter. 1989. Laboratory guide to early life history stages of northeast Pacific fishes. NOAA Technical. Report. NMFS 80, 652 p. Orr, J.W. and S. Hawkins. 2008. Species of the rougheye rockfish complex: resurrection of *Sebastes melanostictus* (Matsubara, 1934) and a redescription of *Sebastes aleutianus* (Jordan and Evermann, 1898) (Teleostei: Scorpaeniformes). Fisheries Bulletin. 106: 111-134.									
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):										

9.5.1.5 Supporting Clause 12.2.3.

12.2.3.	**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).**
Relevance:	Relevant

Evaluation Parameters	**Met?**
Process: *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).*	☑
EVIDENCE: The Council has established a process to set outcome indicators reflecting management objectives for non-target species in BSAI and GOA groundfish fisheries that ensures avoidance of adverse impacts. In addition, there is a process for monitoring fishery performance against outcome indicators which entails review of results from the NOAA observer program by stock assessment authors during preparation of the Ecosystem Considerations chapter of annual stock assessment reports, as well as review and consolidation of monitoring results into the annual Alaska Ecosystem Status Reports for the Bering Sea and Aleutian Islands as well as Gulf of Alaska.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: In Alaska, there is a strategy in place to manage most bycatch fish species (main species, groundfish, seabirds) which consists of (1) extensive catch accounting system (2) observer program to estimate discarded catch (3) fishery independent surveys conducted by NOAA- Fisheries (4) statistical stock assessments for all of the main bycatch species (5) a tiered system of assessments that provides for more precautionary annual catch limits when assessments use less precise methods. The tiered, precautionary procedure for setting annual catch limits provides a high likelihood that stocks will be maintained at levels above their reference points and, and clear procedures exist for restricting catch limits if stock rebuilding is necessary. Management actions are in place in respect to increasing knowledge on the bycatch dynamics of the directed sablefish and halibut fishery (i.e., methods for the estimation of non-target species catch in the unobserved sablefish IFQ fleet and the restructuring the observer program for inclusion of the sablefish and halibut fleet). Longline and Pot gear is not considered to have serious nor irreversible impacts on marine habitats. Bycatch of seabirds has been addressed by specific regulations put in place to reduce the incidental mortality of the short-tailed albatross, a listed species under the Endangered Species Act (ESA), and other seabird species in 1998, then revised in 2008. None have been taken since 2013. These measures now include the use of tory lines, night setting, lineshooters and lining tubes, and have been shown to significantly reduce seabird interactions. Bycatch data is collected annually indicating that the majority of the bycatch is made up by, rockfish, sharks and skates. These species are managed by the NPFMC under tier 3 and 5 respectively, using OFL and ABC recommendations and catch limits. Evidence of 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 is shown on the stock status of sharks, skates and rockfish, where it had been shown, that for all of these species overfishing is not occurring. Another example is with seabirds. Examining the three fisheries responsible for the majority of seabird bycatch—Pacific cod, sablefish, and halibut demersal longline—the average annual seabird bycatch for 2011 through 2019 was 5,037, 715, and 241 birds per year, respectively. In 2020, the Pacific cod, sablefish, and halibut demersal longline estimated seabird bycatch was quite reduced when compared to the 2011 through 2019 averages (2,924, 125, and 22 birds, respectively); For endangered seabird species bycatch, takes of short-tailed albatross have not been observed in the sablefish fishery since the mid-1990s.	

12.2.3.	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).									
Evidence Basis: *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.*										☑
EVIDENCE: https://www.fisheries.noaa.gov/alaska/bycatch/bycatch-and-prohibited-species-catch-groundfish-and-shellfish-fisheries-alaska https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/BSAIintro.pdf https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAintro.pdf https://repository.library.noaa.gov/view/noaa/32076										
References:										
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):										

9.5.1.6 Supporting Clause 12.2.4.

12.2.4.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on ETP species (Appendix 1, Part 4 and 7), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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 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.*		☑
EVIDENCE: Several federal policies and associated laws establish management guidelines and legal protections for endangered species that might be affected by the Alaskan commercial halibut and sablefish fishery. These policies include the Magnuson-Stevens Act, the Marine Mammal Protection Act and the U.S. Endangered Species Act. ADF&G provides additional protections for species and stocks of concern. The purpose of the ESA is to conserve threatened and endangered species and their ecosystems. There are more than 1,900 species listed under the ESA. A species is considered endangered if it is in danger of extinction throughout all or a significant portion of its range. A species is considered threatened if it is likely to become endangered in the future. The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) share responsibility for implementing the ESA. NMFS is responsible for 94 marine species, from whales to sea turtles and salmon to Johnson's seagrass. The listing of a species as endangered makes it illegal to "take" (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to do these things) that species. Similar prohibitions usually extend to threatened species. Federal agencies may be allowed limited take of species through interagency consultations with NMFS or USFWS. Non-federal individuals, agencies, or organizations may have limited take through special permits with conservation plans. Effects to the listed species must be minimized and in some cases conservation efforts are required to offset the take. NMFS' Office of Law Enforcement works with the U.S. Coast Guard and other partners to enforce and prosecute ESA violations.		
Current status/Appropriateness/Effectiveness: *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.*		☑
EVIDENCE: The purpose of the ESA is to conserve threatened and endangered species and their ecosystems. There are more than 1,900 species listed under the ESA. A species is considered endangered if it is in danger of extinction throughout all or a significant portion of its range. A species is considered threatened if it is likely to become endangered in the future. The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) share responsibility for implementing the ESA. NMFS is responsible for 94 marine species, from whales to sea turtles and salmon to Johnson's seagrass.		

12.2.4.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on ETP species (Appendix 1, Part 4 and 7), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.**

The listing of a species as endangered makes it illegal to "take" (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to do these things) that species. Similar prohibitions usually extend to threatened species. Federal agencies may be allowed limited take of species through interagency consultations with NMFS or USFWS. Non-federal individuals, agencies, or organizations may have limited take through special permits with conservation plans. Effects to the listed species must be minimized and in some cases conservation efforts are required to offset the take. NMFS' Office of Law Enforcement works with the U.S. Coast Guard and other partners to enforce and prosecute ESA violations.

The NOAA Protected Resources program conserves and recovers marine resources by doing the following:
- Listing species under the ESA and designating critical habitat (section 4);
- Developing and implementing recovery plans for listed species (section 4);
- Developing cooperative agreements with and providing grants to States for species conservation (section 6);
- Consulting on any Federal actions that may affect a listed species to minimize the effects of the action (section 7);
- Partnering with other nations to ensure that international trade does not threaten species (section 8);
- Investigating violations of the ESA (section 9);
- Cooperating with non-federal partners to develop conservation plans for the long-term conservation of species (section 10); and
- Authorizing research to learn more about protected species (section 10).

U.S. fisheries management, including that of Alaskan groundfish fisheries, must be consistent with the Magnuson-Stevens Act, the Marine Mammal Protection Act and the U.S. Endangered Species Act. Each of these establishes management guidelines, objectives, and legal protections for threatened and endangered species.

Interactions between Alaskan commercial halibut and sablefish fisheries with marine mammals and birds have been documented through NMFS' Alaska Marine Mammal Observer Program, which reports on these interactions, including incidental take of endangered species. Under the Marine Mammal Protection Act (MMPA), all Category I and II fisheries must be registered in the Marine Mammal Avoidance Program and report any injuries or mortalities of marine mammals to NMFS within 48 hours. All MMPA category fisheries are liable for incidental take of any ESA-listed species.

Evidence Basis: *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 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 are taken. Examples may include various stock and ecosystems assessment reports.*	☑

EVIDENCE:

Marine Mammals

As identified in annual marine mammal stock assessment reports, there is ongoing monitoring of human-caused mortality, serious injury, and non-serious injury of marine mammals. AK Bering Sea[23], Aleutian Islands sablefish longline AK Bering Sea, Aleutian Islands halibut longline and North Pacific. AK Gulf of Alaska halibut longline fisheries are listed in the Federal Register as Category III: Annual mortality and serious injury of a stock in a given fishery is less than or equal to 1% of the Potential Biological Removal (PBR) level (i.e., a remote likelihood of or no known incidental mortality and serious injury of marine mammals).

Seabirds

NOAA's NMFS annually updates its estimates of seabirds caught as bycatch in commercial groundfish fisheries operating in Federal waters off Alaska (Eich *et al*., 2016; Krieger *et al*., 2019). There is no indication of adverse interactions between Halibut/Sablefish and

[23] https://www.federalregister.gov/documents/2022/04/19/2022-08210/list-of-fisheries-for-2022

12.2.4.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on ETP species (Appendix 1, Part 4 and 7), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.**

ESA-listed birds. USFWS does not identify Halibut/sablefish fishery interactions as a threat to short-tailed albatross[24], Stellar's eider[25], spectacled eider[26], or Eskimo curlew[27]. No fishery interactions with Eskimo curlew have been reported in the literature and would seem unlikely given that Halibut/Sablefish fisheries are prosecuted well offshore.

Onboard Observer Program

In addition to the foregoing, the NOAA Alaska Onboard Observer Program provides further evidence that there is adequate assessment of the most probable adverse impact of the halibut/sablefish fisheries on ETP species. Groundfish observers conduct species composition sampling of retained catch and bycatch, and record data on retained catch, fishing effort, and location, and observers also document specific seabird and mammal observations.

References:	Eich, A.M., Mabry, K.R., Wright, S.K., and Fitzgerald, S.M. 2016. Seabird Bycatch and Mitigation Efforts in Alaska Fisheries Summary Report: 2007 through 2015. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/AKR-12, 47p. https://alaskafisheries.noaa.gov/pr/seabird-bycatch-reports. Krieger, J.R., Eich, A.M., and Fitzgerald, S.M. 2019. Seabird Bycatch Estimates for Alaska Groundfish Fisheries: 2018. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/AKR-20, 41 p. doi:10.25923/hqft-we56. https://www.fisheries.noaa.gov/resource/document/seabird-bycatch-estimates-alaska-groundfish-fisheries-2018.

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):	

[24] https://ecos.fws.gov/docs/five_year_review/doc6487.pdf
[25] https://www.fws.gov/species/stellers-eider-polysticta-stelleri
[26] https://www.fws.gov/species/spectacled-eider-somateria-fischeri
[27] https://www.fws.gov/species/eskimo-curlew-numenius-borealis

9.5.1.7 Supporting Clause 12.2.5.

12.2.5.	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.
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑

EVIDENCE:

To guarantee that ETP species are safeguarded from harmful effects from commercial fisheries in Alaska, including the halibut/sablefish fisheries under review here, there are well-established methods for imposing limitations on the catch. For ETP species, these restrictions serve as de facto outcome indicators. However, the specifics of establishing restrictions will change depending on the species concerned and the federal organization in charge of carrying out legislation protecting ETPs.

NMFS

NMFS publishes a List of Fisheries, as required by the MMPA, which reflects current/updated information on interactions between U.S. commercial fisheries and marine mammals. Each commercial fishery on the list is classified into one of three categories based upon the level of mortality and serious injury of marine mammals that occurs incidental to each fishery:

- Category I: Annual mortality and serious injury of a stock in a given fishery is greater than or equal to 50% of the PBR level (i.e., frequent incidental mortality and serious injury of marine mammals).
- Category II: Annual mortality and serious injury of a stock in a given fishery is greater than 1% and less than 50% of the PBR level (i.e., occasional incidental mortality and serious injury of marine mammals).
- Category III: Annual mortality and serious injury of a stock in a given fishery is less than or equal to 1% of the PBR level (i.e., a remote likelihood of or no known incidental mortality and serious injury of marine mammals).

Depending on how a fishery is listed on the List of Fisheries, participants may or may not be required to comply with the MMPA's registration, observer coverage, and take reduction plan criteria. The MMPA forbids the killing or harming of marine mammals in general. The stringent adherence to take limits and reporting requirements, for example, are additional requirements for fisheries in Category I and II. "Strategic marine mammal stocks" are marine mammal stocks that are also classified under the ESA, according to NMFS. To aid in the recovery of the species and stop further depletion, NMFS creates a Take Reduction Plan for each strategic marine mammal stock.

USFWS

The USFWS oversees maintaining the federal list of three marine mammal species, as well as terrestrial and freshwater ETP species (polar bear, Pacific walrus, and sea otter). In extraordinary cases, the USFWS may grant permission for the incidental taking of these three species in compliance with the MMPA's rules (though halibut and sablefish fisheries have never needed such permissions). In accordance with Section 10 of the ESA, the USFWS may also approve the use of incidental take permits for ETP bird species, such as the short-tailed albatross, Stellar's eider, and spectacled eider. These incidental take permits are made public, and the general public is welcome to comment. However, the USFWS does not mandate incidental take licenses in these fisheries due to the rarity/absence of interactions between halibut/sablefish fisheries and the aforementioned ETP seabirds.

Current status/Appropriateness/Effectiveness: *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,*	☑

12.2.5.	**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.**

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.	

EVIDENCE:

There are established outcome indicators that are consistent with guaranteeing that ETP species are safeguarded from negative effects resulting from interactions with Halibut/Sablefish fisheries (including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible), including recruitment overfishing or other impacts. Constant monitoring procedures, such as the AK NOAA Onboard Observer Program, ensure that negative effects on ETP species are avoided.

Under the Marine Mammal Protection Act (MMPA), stock assessment reports for stocks that have been classified as strategic must be evaluated annually, annually for stocks for which there is materially new information, and at least once every three years for all other stocks. When available, each stock assessment includes a description of the stock's geographical range, a minimum population estimate, current trends in population, current and maximum net productivity rates, optimal sustainable population levels, allowable removal levels, and estimates of annual human-caused mortality and serious injury due to interactions with commercial fisheries and subsistence hunters (see Muto *et al*., 2021 for the most recent Marine Mammal stock assessment for the Alaska region).

Additional outcome indicators that are consistent with monitoring for negative impacts on endangered species are detailed in the annual Ecosystems Status Reports for the Aleutian Islands (Ortiz and Zador, 2020) and Eastern Bering Sea (Siddon, 2020). The assessments of stock abundance and/or related parameters for Stellar sea lions, northern fur seals, harbor seals, arctic ice seals (bearded seal, ribbon seal, ringed seal, and spotted seal), and bowhead whales are included as ecological indicators for marine mammals. In order to provide a summary of environmental impacts on seabirds and what that may indicate for ecosystem productivity as it relates to fisheries management, the EBS Ecosystem Status Report also includes an Integrated Seabird Information section. This section integrates seabird data to provide information about seabirds. Sources of seabird data include agency/university researchers, citizen science groups, coastal community members, and long-term monitoring projects like the Alaska Maritime National Wildlife Refuge (e.g., 2019 Seabird Report Card).

The likelihood that halibut/sablefish fishing will negatively affect marine animals or endangered species is quite low. As previously mentioned, the USFWS has identified three ESA-listed seabird species in Alaska: the Short-tailed albatross, *Phoebastria albatrus*; the Spectacled eider, *Somateria fischeri*; and the Steller's eider, *Polysticta stelleri* (threatened) (endangered). According to results from continuous seabird monitoring (Eich *et al*., 2016), there is little to no bycatch of these species in fisheries for halibut and sablefish.

Evidence Basis: *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.*	☑

EVIDENCE:

References cited above.

References:	Eich, A.M., Mabry, K.R., Wright, S.K., and Fitzgerald, S.M. 2016. Seabird Bycatch and Mitigation Efforts in Alaska Fisheries Summary Report: 2007 through 2015. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/AKR-12, 47p. https://alaskafisheries.noaa.gov/pr/seabird-bycatch-reports Muto, M. M., Helker, V. T., Delean, B. J., Young, N.C., Freed, J.C., Angliss, R. P., Friday, N.A., Boveng, P. L., Breiwick, J.M., Brost, B. M., Cameron, M. F., Clapham, P. J., Crance, J. L., Dahle, S. P., Dahlheim, M.E., Fadely, B. S., Ferguson, M.C., Fritz, L.W., Goetz, K.T., Hobbs, R.C., Ivashchenko, Y.V., Kennedy, A. S., London, J.M., Mizroch, S.A., Ream, R.R., Richmond, E.L., Shelden, K.E.W., Sweeney, K.L., Towell, R.G., Wade, P.R., Waite,

12.2.5.	**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.**								
	J.M., and Zerbini, A.N. 2020. Alaska marine mammal stock assessments, 2020. July, 2021. U.S. Dep. Commer., NOAATech. Memo. NMFS-AFSC-421, 407 p. Ortiz, I., and Zador, S. (Eds.) 2020. Ecosystem Status Report 2020 Aleutian Islands. Nov 17, 2020. https://www.fisheries.noaa.gov/alaska/ecosystems/ecosystem-status-reports-gulf-alaska-bering-sea-and-aleutian-islands.								
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):									

9.5.1.8 Supporting Clause 12.2.6.

12.2.6.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on habitats (Appendix 1, Part 5 and 7), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑
EVIDENCE: For example, the Council carries out all provisions of the MSA, including those that specifically deal with EFH and HAPCs, as is covered in further detail under Supporting Clause 12.2.7. Strong evidence that the fishery management organization considers the most likely negative impacts of the BSAI and GOA groundfish fisheries under assessment on habitats is provided by the implementation of EFH and HAPC. This organization does this by evaluating these impacts and, where appropriate, addressing and/or correcting them while taking into account the best scientific evidence and local knowledge. The most likely negative effects of the Sablefish and Halibut fishery on ecosystems are taken into account by well-established processes at the Federal, State, and Council levels. The management response often reflects how serious the identified danger is. The sablefish and halibut species under assessment are neither keystone species nor slow growth/high catchability species (see Supporting Clauses 12.3 and 12.4). There are also no significant negative interactions between the sablefish and halibut fisheries and ETP species (see Supporting Clause 12.2.4). The halibut/sablefish fisheries under assessment do not cause risk factors or elements that are typically associated with a fishery at risk of negatively impacting habitats.		
Current status/Appropriateness/Effectiveness: *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.*		☑
EVIDENCE: The Council carries out all provisions of the MSA, including those that specifically deal with EFH and HAPCs, as is covered in further detail under Supporting Clause 12.2.7. Strong evidence that the fishery management organization considers the most likely negative impacts of the BSAI and GOA groundfish fisheries under assessment on habitats is provided by the implementation of EFH and HAPC. This organization does this by evaluating these impacts and, where appropriate, addressing and/or correcting them while taking into account the best scientific evidence and local knowledge. <u>Habitat Assessment Elements</u>		

12.2.6.	**The fishery management organization shall consider the most probable adverse impacts of the unit of certification on habitats (Appendix 1, Part 5 and 7), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.**

In accordance with guidance to version 2.1 of the RFM Standard, the assessment team evaluated three habitat assessment elements (Appendix 1, part 5) associated with Supporting Clause 12.2.7. Evidence for fulfilment of these elements came in large part from the Fishing Effects (FE) model of Simpson *et al*. (2017), the results of which were incorporated into Section 4.1.3 – Fishing Effects Vulnerability Assessment of Appendix F – Essential Fish Habitat (EFH and Habitat Areas of Particular Concern (HAPC) (Amendment 49 of the BSAI Groundfish FMP; NOAA Fisheries, 2018). The FE model expressly addresses reversibility by incorporating inputs that include, among other things, the distribution and intensity of high-resolution fishing data, and habitat susceptibility and recovery rates. Results from the FE Model, address the amount of habitat disturbed by commercial fishing within the stock's 50 percent quantile Core Essential Area.

Bering Sea Sablefish
Female spawning biomass is at B35%, therefore, BS Sablefish are above the minimum stock size threshold (MSST). Habitat reduction in the BS CEA is generally low in most areas, but there are small, localized areas where habitat reduction is >25% in the southeastern part of the EBS slope. Overall, habitat reduction in the BS CEA averaged 2.2% from 2003 – 2016, and the trend appears to be stable. Habitat impacts on BS Sablefish growth-to-maturity, spawning success, breeding success, and feeding success are not detectable, and no changes to management are recommended at this time.

Aleutian Islands Sablefish
Female spawning biomass is at B35%, so AI sablefish are above MSST. The effects of fishing on the AI CEA are generally very low (<3% habitat reduction), but there are small, localized areas of higher habitat reduction (>25%) near the eastern edge of the AI. Habitat reduction for the AI CEA, as a whole, averaged 2.6 %, with a stable time trend. Habitat impacts on AI sablefish growth-to-maturity, spawning success, breeding success, and feeding success are not detectable. No changes to management are recommended at this time.

Gulf of Alaska Sablefish
Female spawning biomass is above B35%, so GOA sablefish are above MSST. The effects of fishing on the GOA CEA are low, and averaged less than 1% habitat reduction from2003 – 2016. The trend is stable. Habitat impacts on GOA sablefish growth-to-maturity, spawning success, breeding success, and feeding success are undetectable. No changes to management are recommended at this time.

AK Pacific Halibut
Information was insufficient to conduct the three-tiered approach for Pacific Halibut. However, based on the analysis in the 2005 EFH EIS, fishing activities are considered to have overall minimal and temporary effects on the EFH for Halibut. Professional judgement from NMFS and IPHC Stock assessment scientists indicates that fisheries do not adversely affect the EFH of Halibut.

Table 24. Scoring summary: RFM Habitat Assessment Elements.

Habitat Assessment Element	Sablefish	Halibut
1. Effects on sensitive habitats shall be reduced to a minimum percentage of the total area.	< 10 %	Evidence lacking
2. The level of fishery impact is assessed. Physical structure & biological communities are not affected at significant	Not adversely affected	Not adversely affected
3. Management actions shall mitigate potential negative effects of gear on sensitive habitats.	Council actions	Council actions, HAPC protection
Qualitative Score	Full Conformance	Minor Non- Conformance

There is strong evidence that for Sablefish, it meets Habitat Assessment Elements 1-3. However, for Halibut, FE model results does not provide sufficient evidence to meet Habitat Assessment Element 1. Specifically, available information does not enable the assessment team to:

12.2.6.	The fishery management organization shall consider the most probable adverse impacts of the unit of certification on habitats (Appendix 1, Part 5 and 7), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.

- Identify the spatial footprint (i.e., total area in Km2 or nm2) of the fishery on marine habitats (e.g., based on maps of fishing fleet distribution or other data).
- Identify the general range of habitat type/substrate (e.g., sand, muddy, gravel and pebble, rocky reefs, kelp, other biogenic habitats) affected and unaffected by the spatial footprint of the fishery.
- Assess the percentage area of overlap of the fishery with known sensitive habitats using available data. Sensitive habitats include HAPCs, other areas of known distribution rich in structural epifauna, areas of particular importance for ETP species, and closed areas which may be set up for habitat, species conservation, or both.

Stevens (2021) makes the following observation in relation to the aforementioned: "Trap fishing consequences to benthic habitats may involve traps dragging along the bottom during setting and retrieval, which can harm sensitive habitat components such as corals, sponges, and other epifauna." Depending on how and where the gear is fished, lines connecting several pots may enlarge the overall footprint and have the potential to do more harm (Stone, 2006; Stone and Shotwell, 2007). According to Stone and Rooper's (2017) analysis, bottom trawls provide the greatest threat to deep coral ecosystems in Alaska based on the severity, scope, and geographic extent of their use as well as their overlap with coral habitat. Mid-water trawls, single pot sets, and scallop dredges were thought to pose the least harm to deep coral habitats, whereas demersal longlines and long-lined pots were regarded as intermediate threats.

<u>Cumulative effects of fisheries</u>
The assessment team is also instructed by guidance to version 2.1 of the RFM Standard to analyze the cumulative effects of fishing on habitats (Appendix 1, part 7). The 2005 EFH EIS (NMFS, 2005) took into account the cumulative effects of fishing and non-fishing activities on EFH, but the knowledge at the time was insufficient to determine how these factors affect EFH function at an ecosystem or watershed scale. The cumulative effects from various non-fishing anthropogenic sources are being increasingly recognized as having synergistic effects that may deteriorate EFH and associated ecological processes that support sustainable fisheries, according to the 2017 Non-Fishing Effects Report. The FE model analyzes habitat losses at a monthly time step for EFH impacts since 2003 and integrates susceptibility and recovery dynamics, allowing for the first time an assessment of the cumulative effects from fishing operations. Cumulative impacts were taken into account throughout the report (Simpson *et al*., 2017), and the Groundfish FMP has been updated as a result (NOAA Fisheries, 2018).

Based on the above, the team considered that the information presented to the assessment team was not sufficient to confirm that the effects of the AK Pacific Halibut fishery on sensitive habitats is reduced to a minimum percentage of the total area. Because of this potential nonconformance was raised. A notification of the nonconformance was sent to the client and they had 28 days to respond. On April 7 the client provided a response to the nonconformance raised by the team

Response letter from AFDF April 7, 2023
AFDF has prepared maps showing the spatial footprint of the halibut fishery across the Gulf of Alaska and into the Bering Sea and Aleutian Islands. Fishing intensity is quantified by cumulative landed weight from 2010—2021 and binned by ADF&G groundfish statistical areas. AFDF compared fishing activity to sensitive habitat areas in maps provided by the National Marine Fisheries Service (NMFS) showing coral and sponge habitat and Habitat Areas of Particular Concern (HAPCs). Their results showed the following.
The areas of greatest fishing activity for halibut in Alaska occur within Prince William Sound, around Kodiak Island, inside waters of Southeast Alaska, and outside of Unalaska in the Aleutian Islands. Prince William Sound contains relatively little coral and sponge habitat. Southeast Alaska does contain coral gardens, but these are predominantly in outside waters where less fishing activity occurs. At Cape Ommaney and the Fairweather grounds in Southeast, five HAPCs have been designated, banning all bottom contact gear in an area of 14 nm2. HAPCs have also been designated around coral-rich seamounts in the Gulf of Alaska and Bower's Ridge in the Aleutian Islands, restricting a combined 10,639 nm2 from all bottom-contact gear. In the Bering Sea, the Pribilof Habitat Conservation Area restricts an additional 7,000 nm2 from hook and line gear12.Outside of these closed waters, overlap of the halibut longline fishery and coral habitat occurs in Beaver Inlet outside Unalaska, the North end of St. Matthew's Island, areas around Kodiak, and outside of Kachemak Bay. Collectively these areas make up 1,647 nm2 of a total of the 177,155 nm^2 of statistical areas with halibut fishing activity, or 0.9%. Given this small fraction and the extensive habitat conservation areas where no fishing occurs, we

<table>
<tr><td>12.2.6.</td><td colspan="2">The fishery management organization shall consider the most probable adverse impacts of the unit of certification on habitats (Appendix 1, Part 5 and 7), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.</td></tr>
<tr><td colspan="3">believe that the benthic footprint of the Alaskan halibut fishery is minimal (Please see Appendix 1).
Based on the above a potential non-conformance (NC) issue was removed.</td></tr>
<tr><td colspan="2">Evidence Basis:
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.</td><td>☑</td></tr>
<tr><td colspan="3">EVIDENCE:
There is sufficient evidence to substantiate that the fishery management organization considers the most probable adverse impacts to habitats by the BSAI and GOA fisheries under assessment here. Evidence includes:
• FE model results (Simpson et al., 2017)
• Groundfish FMP (NPFMC, 2011) and Amendment 49 (NOAA Fisheries, 2018)
• Council actions associated with HAPCs (see Supporting Clause 12.2.7)
• Monitoring bycatch including HAPC biota via NOAA Observer Program
• Annual Alaska Ecosystem Status Reports (Siddon, 2020; Ortiz and Zador, 2020)</td></tr>
<tr><td>References:</td><td colspan="2">NMFS. 2005. Final Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska. March 2005. National Marine Fisheries Service, P.O. Box 21668, Juneau, AK 99801. https://repository.library.noaa.gov/view/noaa/17391
Ortiz, I., and Zador, S. (Eds.) 2020. Ecosystem Status Report 2020 Aleutian Islands. Nov 17, 2020. https://www.fisheries.noaa.gov/alaska/ecosystems/ecosystem-status-reports-gulf-alaska-bering-sea-and-aleutian-islands.
Siddon, E. (Ed.) 2020. Ecosystem Status Report 2020 Eastern Bering Sea. December 2020. https://www.fisheries.noaa.gov/resource/data/ecosystem-status-report-2020-eastern-bering-sea.
Simpson, S. C., Eagleton, M. P., Olson, J. V., Harrington, G. A., and Kelly, S.R. 2017. Final Essential Fish Habitat (EFH) 5-year Review, Summary Report: 2010 through 2015. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/AKR-15, 115p. https://repository.library.noaa.gov/view/noaa/17257.
Stone RP, Shotwell SK (2007) State of the deep coral ecosystems of the Alaska Region: Gulf of Alaska, Bering Sea, and the Aleutian Islands. In: Lumsden SE, Hourigan TF, Bruckner AW, Dorr G (eds) The state of deep coral ecosystems of the United States. NOAA Tech Memo CRCP-3, Silver Spring, MD, p 65–108.
Stone RP 2006. Coral habitat in the Aleutian Islands of Alaska: depth distribution, fine-scale species associations, and fisheries interactions. Coral Reefs 25:229–238.
Stone RP, Rooper CN (2017) State of Deep-Sea Coral and Sponge Ecosystems in theAlaska Region. In: Hourigan TF, Etnoyer PJ, Cairns SD (eds.). The State of Deep-SeaCoral and Sponge Ecosystems of the United States. NOAA Technical Memorandum NMFS-OHC-4. Silver Spring, MD. 35 p.</td></tr>
</table>

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):	

9.5.1.9 Supporting Clause 12.2.7.

12.2.7.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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 analysed though 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.*		☑

EVIDENCE:

Sablefish

The Magnuson-Stevens Act requires fishery management plans to describe and identify Essential Fish Habitat (EFH), minimize to the extent practicable adverse effects of fishing on EFH, and identify other actions to conserve and enhance EFH (16 U.S.C. 1853(a)(7)). Essential fish habitats (EFHs) for Alaska sablefish include marine environments, designated and protected by the North Pacific Fishery Management Council, NMFS and ADF&G. Fishing and gear restrictions are in place to protect designated marine areas of EFH, as described in Fisheries Management Plan for Groundfish Fisheries in the EEZ off Alaska. The Fishery Management Plan (FMP) for Groundfish Fisheries in the EEZ off Alaska contains detailed descriptions of essential fish habitats (EFH) that occur in the state's marine waters, and habitat areas of particular concern. The FMP relates that, "The EFH regulations at 50 CFR 600.815(a)(8) provide guidance on identifying habitat areas of particular concern (HAPCs). HAPCs are meant to provide greater focus to conservation and management efforts and may require additional protection from adverse effects. Fishery management plans should identify specific types or areas of habitat within EFH as HAPCs based on one or more of the following considerations:

1. the importance of the ecological function provided by the habitat;
2. the extent to which the habitat is sensitive to human-induced environmental degradation;
3. whether, and to what extent, development activities are, or will be, stressing the habitat type; or
4. the rarity of the habitat type.

There are 2 fishery management plans. One for the Bering Sea and Aleutian Islands and one for the Gulf of Alaska

Halibut

There is considerable knowledge of the essential habitats for the Pacific Halibut and the potential fishery impacts on these habitats. Pacific halibut are common inhabitants of shallow estuarine waters t spending a portion of their life cycles in the estuarine ecosystem complex. Seasonal ocean circulation and stratification patterns, health of species (levels of contaminants, size and weight), population numbers, and food quality all contribute to fish population levels.

While much of the halibut harvest takes place in the Gulf of Alaska, the waters of Bristol Bay and the southeast Bering Sea shelf are nursery grounds important to the overall health of the Pacific halibut population. Young halibut spend two or three years growing in these rich, nursery areas, after which they migrate to other parts of the Bering Sea, through the Aleutian passes and into the North Pacific where they live out their adult lives.

Neither the IPHC nor the NPFMC has a specific fishery management plan for Pacific Halibut. However, each Council has approved provisions that supplement protection of essential habitats for Pacific Halibut for its completion of its life cycle.

12.2.7.	**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.**

Current status/Appropriateness/Effectiveness: *Successful management measures have been developed and are in place to achieve the objectives described in the process parameter.*	☑

EVIDENCE:

Sablefish

The MSA requires fishery management plans to describe and identify Essential Fish Habitat (EFH), minimize to the extent practicable adverse effects of fishing on EFH, and identify other actions to conserve and enhance EFH (16 U.S.C. 1853(a)(7)). Alaska has more than 50% of the U.S. coastline and leads the United States in fish habitat area and value of fish harvested. Major research programs aim to identify habitats that contribute to the survival, growth, and productivity of sablefish, and to determine how to best manage and protect these habitats. For example, the Marine Ecology and Stock Assessment group from the AK ASFC Auke bay lab have been working on life history of sablefish and identification of essential fish habitat[28]

Essential fish habitat (EFH) research support is based on priorities from the EFH Research Implementation Plan for Alaska. Around $450,000 is spent on EFH research projects each year. Project results are described in annual reports and peer-reviewed literature. Study results contribute to existing Essential Fish Habitat data sets. All federal agencies must consult with NMFS regarding any action they authorize, fund, or undertake that may adversely affect EFH, and NMFS must provide conservation recommendations to federal and state agencies regarding any action that would adversely affect EFH. All significant permits and actions are subject to the Environmental Impact Statement (EIS) process, which not only requires thorough review by scientists and agencies, but also mandates thorough and comprehensive public information and transparency.

The FMP for Groundfish Fisheries in the EEZ off Alaska contains detailed descriptions of essential fish habitats (EFH) that occur in the state's marine waters, and habitat areas of particular concern. The FMP relates that, "The EFH regulations at 50 CFR 600.815(a)(8) provide guidance on identifying habitat areas of particular concern (HAPCs). HAPCs are meant to provide greater focus to conservation and management efforts and may require additional protection from adverse effects. Fishery management plans should identify specific types or areas of habitat within EFH as HAPCs based on one or more of the following considerations:

1. the importance of the ecological function provided by the habitat;
2. the extent to which the habitat is sensitive to human-induced environmental degradation;
3. whether, and to what extent, development activities are, or will be, stressing the habitat type; or
4. the rarity of the habitat type.

Designations of EFH for sablefish in GOA are as follow:

4.2.2.2.3 Sablefish

Eggs: EFH for sablefish eggs is the general distribution area for this life stage, located in deeper waters along the slope (200 to 3,000 m) throughout the GOA, as depicted in Figure E-7.

Larvae: EFH for larval sablefish is the general distribution area for this life stage, located in epipelagic waters along the middle shelf (50 to 100 m), outer shelf (100 to 200 m), and slope (200 to 3,000 m) throughout the GOA, as depicted in Figure E-8.

Early Juveniles: No EFH description determined. Generally, have been observed in inshore water, bays, and passes, and on shallow shelf pelagic and demersal habitat. Information is limited.

Late Juveniles: EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the GOA, as depicted in Figure E-9.

Adults: EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the GOA, as depicted in Figure E-9.

[28] https://www.fisheries.noaa.gov/about/auke-bay-laboratories

12.2.7.	**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.**

Designations of EFH for Sablefish in BSAI are as follow:
4.2.2.2.3 Sablefish
Eggs: No EFH description determined. Scientific information notes the rare occurrence of sablefish eggs in the BSAI.
Larvae: EFH for larval sablefish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI, as depicted in Figure E- 6.
Early Juveniles: No EFH description determined. Generally, have been observed in inshore water, bays, and passes, and on shallow shelf pelagic and demersal habitat. Information is limited.
Late Juveniles: EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the BSAI, as depicted in Figure E-7.
Adults: EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 m) throughout the BSAI, as depicted in Figure E-7

Proposed HAPCs, identified on a map, must meet at least two of the four considerations establish in 50 CFR 600.815(a) (8), and rarity of the habitat is a mandatory criterion. HAPCs may be developed to address identified problems for fishery management plans species, and they must meet clear, specific, adaptive management objectives.

The Council will initiate the HAPC process by setting priorities and issuing a request for HAPC proposals. Any member of the public may submit a HAPC proposal. HAPC proposals may be solicited every 5 years to coincide with the EFH 5-year review, or may be initiated at any time by the Council. The Council will establish a process to review the proposals. The Council may periodically review existing HAPCs for efficacy and considerations based on new scientific research.
These HAPCs have been designated to groundfish in general and not just only sablefish.
Since 2005, the Council identified the following areas as HAPCs:

- Alaska Seamount Habitat Protection Areas
- Bowers Ridge Habitat Conservation Zone
- Gulf of Alaska Coral Habitat Protection Areas
- Gulf of Alaska Slope Habitat Protection Areas
- Areas of Skate Egg Concentration

The FMP further relates that the Fisheries Council established the Aleutian Islands Habitat Conservation Area, Aleutian Islands Coral Habitat Protection Areas, and the Gulf of Alaska Slope Habitat Conservation Areas to protect salmon EFH from fishing threats, with the following fishing restrictions in these areas:
<u>Aleutian Islands Habitat Conservation Area</u>
The use of non-pelagic trawl gear, as described in 50 CFR part 679, is prohibited year-round in the Aleutian Islands Habitat Conservation Area, except for the designated areas open to non-pelagic trawl gear fishing.

<u>Aleutian Islands Coral Habitat Protection Area</u>
The use of bottom contact gear, as described in 50 CFR part 679, and anchoring by federally permitted fishing vessels is prohibited in Aleutian Islands Coral Habitat Protection Areas.

<u>GOA Slope Habitat Conservation Area</u>
The use of non-pelagic trawl gear in the GOA Slope Habitat Conservation Areas by any federally permitted fishing vessel, as described in 50 CFR part 679, is prohibited.

<u>Alaska Seamount Habitat Protection Area</u>

12.2.7.	**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.**

The use of bottom contact gear and anchoring by a federally permitted fishing vessel, as described in 50 CFR part 679, is prohibited in the Alaska Seamount Habitat Protection Area.

Bowers Ridge Habitat Conservation Zone

The use of mobile bottom contact gear, as described in 50 CFR part 679, is prohibited in the Bowers Ridge Habitat Conservation Zone.

GOA Coral Habitat Protection Areas within GOA Coral HAPC

The GOA Coral Habitat Protection Areas are five specific areas within the larger GOA Coral HAPC. Maps of these areas, as well as their coordinates, are in Appendix A. The use of bottom contact gear and anchoring, as described in 50 CFR part 679, is prohibited in these areas.

Halibut

There is considerable knowledge of the essential habitats for the Pacific Halibut and potential fishery impacts on them. Pacific halibut are common inhabitants of shallow estuarine waters. Pacific Halibut spend a portion of their life cycles in the estuarine ecosystem complex[29]. Seasonal ocean circulation and stratification patterns, health of species (levels of contaminants, size and weight), population numbers, and food quality all contribute to fish population levels.

Spawning occurs during the winter in deep water (180-450 m) along the continental slope at a number of well-known locations in the Bering Sea, Aleutian Islands, and Gulf of Alaska south to British Columbia. Adult halibut migrate to the continental shelf edge in winter (November through March) to spawn. Major spawning grounds are thought to be concentrated in the central and western Gulf of Alaska (GOA) and the southern Bering Sea shelf edge[30].

Females spawn repeatedly over the season, producing as many as 2 million eggs. Eggs are laid in deep water along the slope and are then left to drift in the ocean currents as they mature through the hatching and larval phases. The eggs develop at depth and larvae remain in the water column for as long as 7 months. As they develop, the larv.ae move to shallower water and young-of-the-year juveniles (30 mm and larger) are common in shallow, near-shore waters 2-50 m deep in Alaska and British Columbia.

In terms of their general distribution in the first year after settlement. Pacific halibut are found extensively in coastal nursery areas and have been shown to prefer small-grain sandy sediment253. Small juveniles consume small crustaceans and other benthic organisms and become largely piscivorous by 30 cm during their second year. With increasing age and size, the fish move to deeper water and migrate south to the fishing grounds. Halibut are usually on or near the bottom over mud, sand, or gravel banks. Most are caught at depths of 90 to 900 feet, but halibut have been recorded at depths up to 3,600 feet. As halibut mature, they migrate in a clockwise direction in the Gulf of Alaska, countering the drift of eggs and larvae.

Important Fisheries Nursery Grounds

Bristol Bay Fish Nursery[31]

While much of the halibut harvest takes place in the Gulf of Alaska, the waters of Bristol Bay and the southeast Bering Sea shelf are nursery grounds important to the overall health of the Pacific halibut population. Young halibut spend two or three years growing in these rich, nursery areas, after which they migrate to other parts of the Bering Sea, through the Aleutian passes and into the North Pacific where they live out their adult lives.

The importance of these nursery grounds has been recognized by fishery managers for decades. In 1967, the IPHC closed a significant area of the southeast Bering Sea to halibut fishing in order to protect young fish during this sensitive life stage (Figure 18).

[29] http://www.seakfhp.org/wp-content/uploads/2013/03/estuaries_cap_final_03_30_11.pdf
[30] http://www.iphc.int/publications/rara/2014/rara2014_24juveniledist.pdf
[31] http://www.akmarine.org/wp-content/uploads/2014/06/AMCC_bristol-bay-report-01-01-12.pdf..

12.2.7.	**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.**

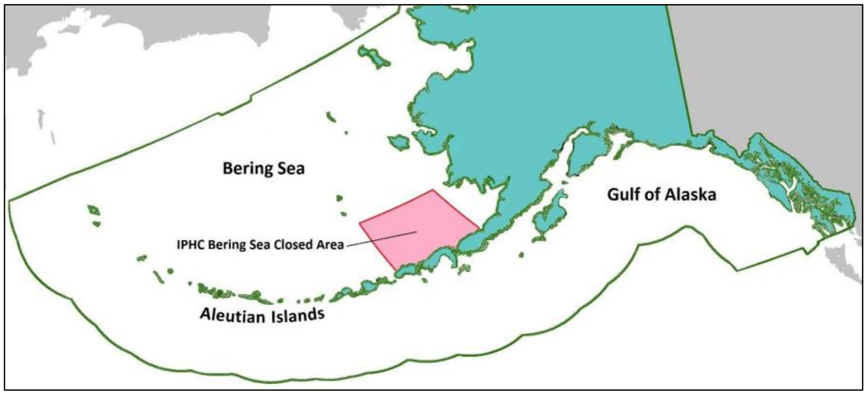

Figure 18. IPHC Bering Sea Closed Area – Closed Area for Juvenile Pacific Halibut.

Habitat Management

The Pacific halibut stock is managed under the Pacific Halibut treaty between Canada and the United States[32]. The International Pacific Halibut Commission (IPHC) is responsible for assessing the status of the stocks and setting harvest strategies and catch limits that provide for optimum yield. Within the United States, the North Pacific Fishery Management Council (NPFMC) is responsible for allocating the halibut resource among users and user groups fishing off Alaska. The National Marine Fisheries Service (NMFS) is responsible for developing, implementing, and enforcing regulations pertaining to management of halibut fisheries in U.S. waters. The State of Alaska participates in management through the ADF&G Commissioner's seat on the North Pacific Fishery Management Council.

The IPHC have not developed a specific FMP for Pacific halibut; however, Article III of the Convention requires IPHC to 'make recommendations as to the regulation of the halibut fishery of the North Pacific Ocean, including the Bering Sea, which may seem desirable for its preservation and development[33].

Nearly all of the research done by the IPHC staff is directed toward one of three continuing objectives of the Commission: i) improving the annual stock assessment and quota recommendations; ii) developing information on current management issues; and iii) adding to knowledge of the biology and life history of halibut.

NPFMC also does not have a specific FMP for Pacific halibut; however, the groundfish FMPs for BSAI and GOA have supplemental measures for halibut given that it is a prohibited species. Because significant interactions occur between the Pacific halibut fishery and the BSAI and GOA groundfish fisheries, numerous management measures in the FMPs were established for the expressed purpose of mitigating possible adverse effects of the groundfish fisheries on the halibut resource.

For groundfish, the BSAI[34] and GOA FMPs[35] have 46 short- and long-term objectives divided into nine categories: (1) Prevent Overfishing; (2) Promote Sustainable Fisheries and Communities; (3) Preserve Food Web; (4) Manage Incidental Catch and Reduce By-Catch and Waste; (5) Avoid Impacts to Seabirds and Marine Mammals; (6) Reduce and Avoid Impacts to Habitat; (7) Promote Equitable and Efficient Use of Fishery Resources; (8) Increase Alaska Native Consultation; and (9) Improve Data Quality, Monitoring and Enforcement.

The North Pacific Fishery Management Council identifies priorities for research, over the next 1 to 5 years, as those activities that are the most important for the conservation and management of fisheries in the Gulf of Alaska, Aleutian Islands, eastern Bering Sea, and the Arctic[36] Specific to Pacific halibut, the current list of NPFMC research priorities have some research items on habitat issues. For example, one of the research priorities for NPFMC is to "evaluate the biological effects of establishing spatial protections of juvenile halibut from fishing gear on BSAI halibut stock health".

12.2.7.	**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.**

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is 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 are avoided, minimized, or mitigated. In assessing fishery impacts, the full spatial range of the relevant habitat is considered, not just the part of the spatial range that is potentially affected by fishing. Examples may include various regulations, data, and reports.*	☑

EVIDENCE:
There is sufficient evidence to substantiate that there is knowledge of EFH for Sablefish and Halibut stocks and that potential fishery impacts on Sablefish EFH as well as impacts on HAPCs are avoided, minimized, or mitigated. Evidence includes:

- EFH for BSAI and GOA Sablefish is described in FMP.
- Amendment 49 to the Groundfish FMP updates EFH descriptions.
- EFH has been mapped (Alaska EFH Mapper)
- Regulations/closures are in place to protect HAPCs
- The next 5-year EFH review has been initiated

References:								
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):									

[32] http://www.adfg.alaska.gov/index.cfm?adfg=halibut.management
[33] http://www.iphc.int/about-iphc.html
[34] http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
[35] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[36] http://www.npfmc.org/research-priorities

9.5.1.10 Supporting Clause 12.2.8.

12.2.8.	**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.**
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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.*	☑

EVIDENCE:

Halibut and Sablefish

Mechanisms for establishing outcome indicators for EFH (Essential Fish Habitat) and sensitive/vulnerable habitats, including HAPCs, are available from the Council and NMFS.

The MSA requires fishery management plans to describe and identify EFH, minimize to the extent practicable adverse effects of fishing on EFH, and identify other actions to conserve and enhance EFH (16 U.S.C. 1853(a)(7)). Alaska has more than 50% of the U.S. coastline and leads the United States in fish habitat area and value of fish harvested. Major research programs aim to identify habitats that contribute to the survival, growth, and productivity of sablefish, and to determine how to best manage and protect these habitats. For example the Marine Ecology and Stock Assessment group from the AK ASFC Auke bay lab have been working on life history of sablefish and identification of essential fish habitat[37]

EFH research support is based on priorities from the EFH Research Implementation Plan for Alaska. Around $450,000 is spent on EFH research projects each year. Project results are described in annual reports and peer-reviewed literature. Study results contribute to existing Essential Fish Habitat data sets. All federal agencies must consult with NMFS regarding any action they authorize, fund, or undertake that may adversely affect EFH, and NMFS must provide conservation recommendations to federal and state agencies regarding any action that would adversely affect EFH. All significant permits and actions are subject to the Environmental Impact Statement (EIS) process, which not only requires thorough review by scientists and agencies, but also mandates thorough and comprehensive public information and transparency.

The FMP for Groundfish Fisheries in the EEZ off Alaska contains detailed descriptions of EFH that occur in the state's marine waters, and habitat areas of particular concern. The FMP relates that, "The EFH regulations at 50 CFR 600.815(a)(8) provide guidance on identifying habitat areas of particular concern (HAPCs). HAPCs are meant to provide greater focus to conservation and management efforts and may require additional protection from adverse effects. Fishery management plans should identify specific types or areas of habitat within EFH as HAPCs based on one or more of the following considerations:
1. the importance of the ecological function provided by the habitat;
2. the extent to which the habitat is sensitive to human-induced environmental degradation;
3. whether, and to what extent, development activities are, or will be, stressing the habitat type; or
4. the rarity of the habitat type.

Achieving management goals for avoiding, reducing, or mitigating habitat impacts of sablefish/halibut fishing to EFH and HAPCs is supported by outcome indicators.

Current status/Appropriateness/Effectiveness: *Successful outcome indicators and management measures have been developed and are in place to achieve the objectives described in the process parameter.*	☑

EVIDENCE:

Halibut and Sablefish

[37] https://www.fisheries.noaa.gov/about/auke-bay-laboratories

12.2.8.	**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.**

The management system has produced performance indicators based on management objectives that aim to avoid, reduce, or mitigate impacts on EFH and on habitats that are extremely sensitive to damage from the fishing gear of the unit of certification. The ecosystems of the Bering Sea, Aleutian Islands, and Gulf of Alaska are yearly assessed and monitored using a variety of ecosystem indicators (Zador 2015, 2016; Siddon and Zador, 2019; Ortiz and Zador, 2020; Siddon, 2020; see Supporting Clause 12.2.10), and many of these indicators have a direct or indirect relationship with habitat outcomes. For the BSAI fisheries that are being evaluated, the outcome indicator(s) effectively reflect those management objectives.

Council Actions

The Council has taken a variety of steps to protect essential habitats in the Bering Sea. Notably, the Council implemented preventative measures in June 2007 to preserve the habitat of benthic fish in the Bering Sea by "freezing the footprint" of bottom trawling by limiting trawl effort to only those regions that had recently been trawled. Bottom trawling is now prohibited in three habitat conservation zones including St Matthew Island, St Lawrence Island, and a region comprising Nunivak Island-Etolin Strait-Kuskokwim Bay, as well as in a deep slope and basin area (47,000 nm^2) that was implemented in 2008. The Northern Bering Sea Research Area, which encompasses the shelf seas to the north of St. Matthew Island, was also established by the Council (85,000 nm2). It was decided to do a study on the effects of bottom trawling on benthic habitat in the northern Bering Sea. It is not permitted to use bottom trawls in the Northern Bering Sea Research Area. Before any commercial trawling was permitted, the Council aimed to create a study strategy that would produce information to enable a better understanding of the potential effects of trawling on the benthic and epibenthic fauna of the northern Bering Sea.

Table 25. Number of actions to protect habitat in Alaska.

Amendment number	Year	Action
9	1985	Incorporate Habitat Protection Policy
21a	1992	Establish the Pribilof Island Habitat Conservation Area (HCA)
37	1996	Establish Bristol Bay Red King Crab Savings Area
55	1998	Define EFH
57	1998	Pollock Bottom Trawl Prohibition
78	2005	EFH EIS, which redefined EFH, and established the Aleutian Islands (AI) HCA, the AI Coral Habitat Protection Areas, Alaska Seamount Halibut Protection Areas, and the Bowers Ridge HCA
89	2007	Bering Sea Habitat Conservation Area
94	2009	Required bottom trawl sweep modification to revise boundaries of the Northern Bering Sea Research Area and the Saint Matthew Island HCA
98	2011	Essential Fish Habitat Omnibus Amendments
104	2013	Develop Skate HAPCs
115*	2017	Essential Fish Habitat Omnibus Amendments

Six locations in the eastern Bering Sea with reasonably significant densities of skate eggs for various skate species were recently designated as HAPCs by the Council (family Rajidae). Within these skate egg HAPCs, fishing operations are not regulated. The Council has additionally implemented the following preventative measures: To protect sensitive habitats, large areas around the Pribilof Islands, Bristol Bay, and the Bering Sea Red King Crab Closure Area have been closed to bottom trawling and scalloping.

Federal Monitoring Indicators

NOAA Fisheries compiles annual Ecosystem Status Reports for the Gulf of Alaska, Bering Sea and Aleutian Islands. At least four of these outcome indicators are useful for monitoring of adverse impacts to habitats.

1) Habitat – Structural Epifauna, Aleutian Islands (from Rooper, 2016). Seapens/seawhips, corals, anemones, and sponges are examples of groups regarded as structural epifauna, originally known as HAPC biota. Although the Aleutian Islands' biennial survey appears to capture regional trends in presence or absence, it does not accurately sample estimate the abundance of the HAPC fauna. However, survey work is fairly minimal in rocky or rugged terrain where these groupings are probably more numerous. The effects of fishing and the effects of climate change have been highlighted as the two main threats to populations of benthic invertebrates in the Aleutian Islands. The Aleutian Islands are home to both processes. Since 2006, a large portion of the benthic habitat in the Aleutians (about 50% of the shelf and slope to depths of 500 m) has been shielded from mobile fishing gear; however, no research has been done to establish whether the closures may have caused population growth or recovery.
2) Area Disturbed by Trawl Fishing Gear in the Eastern Bering Sea (Grieg and Zador, 2015). The habitat that a fish species uses for the processes of spawning, breeding, feeding, or growth to maturity might be impacted by fishing gear. An estimation of the quantity of seafloor that has been disturbed by trawl gear can serve as an indicator of habitat disturbance. From 1990 to 2014, data from observer trawls were used to compute the area disturbed in the Eastern Bering Sea floor.

12.2.8.	**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.**

3) Time Trends in Non-Target Species Catch (Whitehouse *et al*., 2015). In the ecosystems of the Eastern Bering Sea (EBS), Gulf of Alaska (GOA), and Aleutian Islands (AI), the catch of non-target species is monitored in groundfish fishing. Scyphozoan jellyfish, species connected to habitat areas of particular concern (HAPC), such as seapens/whips, sponges, anemones, corals, and tunicates, and various invertebrates, are the three categories of non-target species that are monitored (bivalves, brittle stars, hermit crabs, miscellaneous crabs, sea stars, marine worms, snails, sea urchins, sand dollars, sea cucumbers, and other miscellaneous invertebrates). Information is gathered from groundfish fisheries. As a result, the usefulness of this indicator in connecting habitat trends to sablefish/halibut fisheries may be restricted.

4) Maintaining and Restoring Fish Habitats (Olson, 2015). This indicator examines regions in the EBS/AI and GOA that are off-limits to bottom trawling. There have been numerous trawl closures put in place to preserve benthic habitat or lessen bycatch of restricted species (i.e., salmon, crab, herring, and halibut). While some trawl closures are seasonal, others are year-round. Generally speaking, year-round trawl bans have been put in place to save delicate benthic habitat. By closing locations where and when bycatch rates previously were high, seasonal closures are utilized to lower bycatch. It is challenging to link observed trends to sablefish/halibut longline and pot fishing since this indicator does not distinguish trawl closures from closures of other gear types (fixed gears, bottom contact gears).

Evidence Basis: *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.*	☑

EVIDENCE:

There is evidence that outcome indicators help to achieve management objectives of avoiding, minimizing, or mitigating impacts on EFH for BSAI and GOA groundfish stocks under assessment and on habitats that are highly vulnerable to damage by the fishing gear. Evidence includes:

- EFH for BSAI and GOA sablefish is described in Groundfish FMP.
- Fishing Effects (FE) model results in updated EFH descriptions (Amendment 49).
- EFH has been mapped (Alaska EFH Mapper)
- Regulations/closures are in place to protect HAPCs
- Ecosystem Status reports utilize outcome indicators of direct relevance to monitoring habitats

References:

Grieg, A. and Zador, S. 2015. Area Disturbed by Trawl Fishing Gear in the Eastern Bering Sea. In: Zador, S., (Ed.) (2015) Ecosystem Considerations 2015: Status of Alaska's Marine Ecosystems. NPFMC November 16, 2015, 297 p. https://www.afsc.noaa.gov/REFM/Docs/2015/ecosystem.pdf.

NPFMC, 2019. Bering Sea Fishery Ecosystem Plan. North Pacific Fishery Management Council. January 2019. 133 p. https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf.

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Rooper, C. 2016. Habitat. Structural Epifauna - Aleutian Islands. Pp.58-61 In: Zador, S., (Ed.) (2016) Ecosystem Considerations 2016: Status of the Aleutian Islands Marine Ecosystem. NPFMC November 14, 2016, 110 p. https://access.afsc.noaa.gov/reem/ecoweb/index.php?ID=31.

Siddon, E. (Ed.) 2020. Ecosystem Status Report 2020 Eastern Bering Sea. December 2020. https://www.fisheries.noaa.gov/resource/data/ecosystem-status-report-2020-eastern-bering-sea.

Siddon, E. and Zador, S. (Eds.) 2019. Ecosystem Status Report 2019: Eastern Bering Sea. EBS Ecosystem Status. 223 p. https://apps-afsc.fisheries.noaa.gov/refm/reem/ecoweb/index.php.

12.2.8.	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.								
	Whitehouse, A., Gaichas, S. and Zador, S. 2015. Time Trends in Non-Target Species Catch. In: Zador, S., (Ed.) (2015) Ecosystem Considerations 2015: Status of Alaska's Marine Ecosystems. NPFMC November 16, 2015, 297 p. https://www.afsc.noaa.gov/REFM/Docs/2015/ecosystem.pdf. Zador, S., (Ed.) 2015. Ecosystem Considerations 2015: Status of Alaska's Marine Ecosystems. NPFMC November 16, 2015, 297 p. https://www.afsc.noaa.gov/REFM/Docs/2015/ecosystem.pdf. Zador, S., (Ed.). 2016. Ecosystem Considerations 2016. Status of the Aleutian Islands Marine Ecosystem. NPFMC November 14, 2016, 110 p. https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysAI.pdf.								
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):									

9.5.1.11 Supporting Clause 12.2.9.

12.2.9.	**The fishery management organization shall consider the most probable adverse impacts of the fishery under assessment on the ecosystem (Appendix 1, Part 6), by assessing and, where appropriate, addressing and or/correcting them, taking into account available scientific information and local knowledge.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑

EVIDENCE:

Sablefish and Halibut

The BS FEP (NPFMC, 2020) addresses ecosystem-based fishery management at the broadest level for all commercial fisheries in the Bering Sea. The BS FEP includes six established "Ecosystem Goals", as well as explicit principles, rules, and guidelines for ecosystem-based management to be applied in Fishery Management Plans. These measures are intended to meet the requirements of the MSA and other applicable laws.

1. Maintain, rebuild, and restore fish stocks at levels sufficient to protect, maintain, and restore food web structure and function.
2. Protect, restore, and maintain the ecological processes, trophic levels, diversity, and overall productive capacity of the system.
3. Conserve habitats for fish and other wildlife.
4. Provide for subsistence, commercial, recreational, and non-consumptive uses of the marine environment.
5. Avoid irreversible or long-term adverse effects on fishery resources and the marine environment.
6. Provide a legacy of healthy ecosystems for future generations.

To maximize food production and safeguard the marine ecosystem, the Council's current practices and guidelines for managing fisheries in the Bering Sea EEZ take interactions between Bering Sea fisheries, ecosystems, and human activities into account. This is explained in detail in Section 7 of the BS FEP. Section 7 outlines the legal basis for Council action as well as the participation of state and federal agencies, academic institutions, and the public in Council procedures.

Regarding the assessment unit under review, procedures are in place at the council, federal, and state levels to guarantee that the most likely effects from BSAI groundfish fisheries are evaluated, considered, and remedied as needed. You can find evidence describing agency roles in recognizing ecosystem threats, judging the seriousness of those risks, and taking management action under "Current Status" below.

There is no fishery ecosystem plan for the Gulf of Alaska.

Current status/Appropriateness/Effectiveness: *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'*	☑

12.2.9.	The fishery management organization shall consider the most probable adverse impacts of the fishery under assessment on the ecosystem (Appendix 1, Part 6), by assessing and, where appropriate, addressing and or/correcting them, taking into account available scientific information and local knowledge.

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.	
EVIDENCE: Organizations that manage fisheries have a proven track record of evaluating any potential negative effects that the BSAI groundfish fishery may have on the ecosystem. In compliance with the terms of the National Environmental Policy Act of 1969, NMFS published the Final Environmental Impact Statement (FEIS) for the BSAI groundfish fishery in 2004. (NEPA). Additionally, the Fishery Management Plan for groundfish fisheries was supported primarily by the Groundfish FEIS. It evaluated the environmental effects of fishery management actions and summarized and analyzed the best available scientific data about groundfish resources and the benthic environment in the BSAI. The Council has recommended conservation and management measures to NMFS and has taken ecosystem issues into account while determining the annual TAC. Protecting marine food webs, monitoring ecosystem health, analyzing ecological, social, and economic trade-offs of various management actions, minimizing bycatch, preserving crucial habitat, preventing impacts on seabirds and marine mammals, modifying management to maintain resilient fisheries and ecosystems in a changing climate, ensuring sustained participation of fishing communities, and more are recent examples of ecosystem considerations in Bering Sea fisheries. Ongoing programs to assess and monitor for potential ecosystem impacts of fisheries is described in the BS FEP (NPFMC, 2020). Programs include: Stock Assessments and Annual Catch Limits; AFSC Bottom Trawl Survey; AFSC Midwater/Acoustic Trawl Survey; AFSC Longline Surveys; IPHC Fishery-Independent Setline Survey; Bering Sea Integrated Ecosystem Research Program; Alaska Integrated Ecosystem Assessment; Marine Mammal Assessment; and Ecosystem Component Species.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: Herring (such as *Clupea pallasi*), other fresh bait, like Pacific cod (*Gadus macrocephalus*), or both are used to bait longline pots. Typically, herring is put into a "bait bag" and fastened to the trap so that it won't drift away. As "hanging bait," Pacific cod is frequently fastened to the interior of the trap. The BSAI Groundfish Fishery Management Plan governs how Pacific cod populations are managed (NPFMC, 2020). State harvest regulations are used to manage Alaska's Pacific herring stocks (Woodby *et al*., 2005). The populations in question are not currently overfished, and neither Pacific herring nor Pacific cod are ETP species.	
Evidence Basis: *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.*	☑
EVIDENCE: There is clear evidence that the NPFMC, NMFS and ADF&G consider the most probable impacts of the UoC on the ecosystem, assess and monitor those impacts, and where necessary take remedial actions to address adverse impacts if and when they should arise. Examples include: - Groundfish FMP (NPFMC 2011) - Groundfish EIS (NMFS, 2004) - annual Groundfish SAFE Reports (NPFMC, 2020a) - BS and AI FEPs (NPFMC, 2007; 2018) -NOAA Observer Program	

<table>
<tr><td>12.2.9.</td><td colspan="8">The fishery management organization shall consider the most probable adverse impacts of the fishery under assessment on the ecosystem (Appendix 1, Part 6), by assessing and, where appropriate, addressing and or/correcting them, taking into account available scientific information and local knowledge.</td></tr>
<tr><td colspan="9">- annual Alaska Ecosystem Status Reports (Siddon, 2020; Ortiz and Zador, 2020)</td></tr>
<tr><td>References:</td><td colspan="8">NPFMC, 2019. Bering Sea Fishery Ecosystem Plan. North Pacific Fishery Management Council. January 2019. 133 p. https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf.
NPFMC, 2020b. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. North Pacific Fishery Management Council, November 2020. 175 p. https://www.npfmc.org/bering-seaaleutian-islands-groundfish/.
Ortiz, I., and Zador, S. (Eds.) 2020. Ecosystem Status Report 2020 Aleutian Islands. Nov 17, 2020. https://www.fisheries.noaa.gov/alaska/ecosystems/ecosystem-status-reports-gulf-alaska-bering-sea-and-aleutian-islands.
Siddon, E. (Ed.) 2020. Ecosystem Status Report 2020 Eastern Bering Sea. December 2020. https://www.fisheries.noaa.gov/resource/data/ecosystem-status-report-2020-eastern-bering-sea.
Woodby, D., Carlile, D., Siddeek, S., Funk, F., Clark, J. H., and Hulbert, L. 2005. Commercial Fisheries of Alaska. Alaska Department of Fish and Game, Special Publication No. 05-09, Anchorage. 74 p. https://www.adfg.alaska.gov/fedaidpdfs/sp05-09.pdf.</td></tr>
<tr><td rowspan="2">Numerical score:</td><td>Starting score</td><td rowspan="2">–</td><td rowspan="2">(</td><td>Number of EPs NOT met</td><td rowspan="2">x</td><td rowspan="2">3</td><td rowspan="2">) =</td><td>Overall score</td></tr>
<tr><td>10</td><td>0</td><td>10</td></tr>
<tr><td colspan="8">Corresponding Confidence Rating:
(10 = High; 4 or 7 = Medium; 1 = Low)</td><td>High</td></tr>
<tr><td colspan="8">Corresponding Conformance Level:
(10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)</td><td>Full Conformance</td></tr>
<tr><td colspan="8">Non-conformance Number (if applicable):</td><td></td></tr>
</table>

9.5.1.12 Supporting Clause 12.2.10.

12.2.10.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑

EVIDENCE:

Halibut and Sablefish

The process for developing outcome indicators has been established by the Council with the goal of minimizing the negative effects of fisheries on the ecosystems of the Bering Sea and Aleutian Islands. Ecosystem considerations are taken into account when determining the annual TAC, and conservation and management measures are in line with the overarching policies, objectives, and applicable law for ecosystem-based management, as summarized in the Aleutian Islands Fishery Ecosystem Plan (FEP) (NPFMC, 2007) and Bering Sea Fishery Ecosystem Plan (FEP) (NPFMC, 2019).

The Bering Sea FEP specifies the following topics:
- Protecting marine food webs
- Monitoring ecosystem health
- Evaluating ecological, social, and economic tradeoffs of different management actions
- Reducing bycatch
- Conserving important habitat
- Avoiding impacts to seabirds and marine mammals
- Adapting management to maintain resilient fisheries and ecosystems in a changing climate
- Providing for sustained participation of fishing communities
- Fostering meaningful and diverse stakeholder participation in the Council process

No enhancement activities are associated with Sablefish/Halibut stocks under assessment. Therefore, outcome indicators for habitat modification are not applicable

Current status/Appropriateness/Effectiveness: *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.*	☑

EVIDENCE:

The groundfish fisheries managed by the BSAI and GOA FMP have their own set of outcome indicators. The effects of groundfish fishing on aquatic ecosystems are evaluated using a set of indicators called ecosystem considerations. The management goals of identifying and reducing the negative effects of BSAI and GOA groundfish fisheries on aquatic ecosystems can be met by these ECIs. Ecosystem issues are covered in a chapter of the annual Stock Assessment and Fishery Evaluation (SAFE) reports (NPFMC, 2020, or, more recently, an Ecosystem and Socioeconomic Profile (ESP) for Sablefish) (Shotwell *et al*., 2019a, b).

12.2.10.	**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.**

Managers use outcome indicators that are more widely applicable to the monitoring of Alaska's fisheries and marine ecosystems, as outlined in Alaska Marine Ecosystem Status Reports, in addition to groundfish-specific indicators. By compiling the findings of several research reports into a single publication, the Ecosystem Status Reports seek to: (1) strengthen the connections between ecosystem research and fishery management; and (2) promote new knowledge of the relationships between ecosystem components. To evaluate physical and environmental trends, ecosystem trends, and fishing and fisheries trends, a wide variety of indicators are used. Ecosystem Status Reports are routinely updated and available online; for the most recent reports for the Eastern Bering Sea and Aleutian Islands and Gulf of Alaska, respectively, see Siddon (2020) and Ortiz and Zador (2020). Together, there is compelling evidence that management uses outcome indicators in a way that is consistent with achieving management goals that aim to reduce the negative effects of BSAI and GOA groundfish fisheries on the structure, processes, and functionality of aquatic ecosystems, impacts that are likely to be irreversible or only very slowly reversible.

The groundfish stocks that are being evaluated do not have any linked enhancement operations. As a result, habitat modification outcome indicators are not applicable.

Evidence Basis: *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 do not cause serious or irreversible harm to the natural ecosystem's structure, processes, and function. Examples may include various regulations, data, and reports.*	☑

EVIDENCE:
See referenced cited above.

References:

NPFMC, 2007. Aleutian Islands Fishery Ecosystem Plan. December, 2007. 198 p. https://www.npfmc.org/aleutian-islands-fishery-ecosystem-plan/.

NPFMC, 2019. Bering Sea Fishery Ecosystem Plan. North Pacific Fishery Management Council. January 2019. 133 p. https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf.

Ortiz, I., and S. Zador. (Eds.) 2020. Ecosystem Status Report 2020 Aleutian Islands. Nov 17, 2020. https://www.fisheries.noaa.gov/alaska/ecosystems/ecosystem-status-reports-gulf-alaska-bering-sea-and-aleutian-islands

Shotwell, S.K., M. Dorn, A. Deary, B. Fissel, L. Rogers, and S. Zador. 2019a. Ecosystem and socioeconomic profile of the walleye pollock stock in the Gulf of Alaska. Appendix 1A In Dorn, M.W.,A.L. Deary, B.E. Fissel, D.T. Jones, N.E. Lauffenburger, W.A. Palsson, L.A. Rogers, S.A. Shotwell, K.A. Spalinger, and S.G. Zador. 2019. Assessment of the Walleye Pollock stock in the Gulf of Alaska. Stock assessment and fishery evaluation report for the groundfish resources of the Gulf of Alaska. North Pacific Fishery Management Council, 1007 W 3rd Ave, Suite 400 Anchorage, AK 99501. Pp. 105-15.

Shotwell, S.K., B. Fissel, and D. Hanselman. 2019b. Ecosystem and socioeconomic profile of the Sablefish stock in Alaska. Appendix 3C In Hanselman, D.H., C.J. Rodgveller, K.H. Fenske, S.K. Shotwell, K.B. Echave, P.W. Malecha, and C.R. Lunsford. 2019. Assessment of the Sablefish stock inAlaska. Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea Aleutian Islands and Gulf of Alaska. North Pacific Fishery Management Council, 1007 W 3rd Ave, Suite400 Anchorage, AK 99501. Pp. 157-202.

Siddon, E. (Ed.) 2020. Ecosystem Status Report 2020 Eastern Bering Sea. December 2020. https://www.fisheries.noaa.gov/resource/data/ecosystem-status-report-2020-eastern-bering-sea.

12.2.10.	**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.**

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):	

9.5.1.13 Supporting Clause 12.2.11.

12.2.11.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑
EVIDENCE: Processes have been established by fisheries management organizations to address the ecosystem's most likely negative effects of groundfish fishing. Section 7 of the BS FEP as well sections on the GOA and BSAI FMP details council methods for assessing environmental impacts, analyzing the severity of those impacts to the ecosystem, and formulating conservation and management actions required to mitigate those ecosystem impacts (NPFMC, 2020a, NPFMC 2020b). More generally, NEPA procedures guarantee that human actions that may have an influence on groundfish resources are evaluated and, when necessary, changed. The Council's NEPA-compliant analytical analysis documents evaluate proposed modifications to the management and protection of the groundfish and shellfish stocks for which they are responsible. These materials are extensively disseminated and made accessible so that the general public and other organizations in charge of managing, developing, or managing natural resources will have the chance to testify or remark on potential effects on their area of responsibility. Similar to this, other resource, development, or management agencies that receive federal funding that wish to carry out new activities or develop new regulations that may have an impact on fisheries under the Council's auspices must also create NEPA documents that demonstrate their project's plan conforms to existing Council FMPs and request feedback from the Council on how their proposed activities may have an impact on the resources under Council jurisdiction. Prior to making judgments, NEPA mandates that federal agencies create Environmental Assessments or Environmental Impact Statements. The President's Council on Environmental Quality, or CEQ, which was established in conjunction with NEPA, has adopted regulations and other advice that outline broad steps that federal agencies should take when creating these documents. Additionally, each federal agency has created its own elaborate NEPA procedures, and federal courts have significantly influenced NEPA's interpretation and application after more than 30 years of litigation. A Citizen's Guide to NEPA (CEQ, 2007) and The NEPA Book (Bass *et al*., 2001) both provide additional information on the procedure.		
Current status/Appropriateness/Effectiveness: *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.*		☑

12.2.11.	**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.**

EVIDENCE:

Fishery Management organizations have considered the most probable adverse impacts of Sablefish/Halibut fisheries on the ecosystem (NMFS 2004; also see Supporting Clause 12.2.9). The consensus view is that impacts to ecosystems from sablefish/halibut fisheries are unlikely to be irreversible or very slowly reversible.

The potential for adverse environmental impacts on BSAI groundfish resources from human activities are also assessed. NPFMC and NMFS conduct regular assessments of groundfish ecosystems and habitats and investigate how environmental factors affect groundfish resources. Findings and conclusions are published in the Ecosystem Considerations chapter of the annual SAFE document (e.g. 2020 SAFE, NPFMC, 2020a and NPFMC 2020b), ESPs , and the various other research reports (e.g., Aydin *et al*., 2007).

Currently, the best available science indicates that the largest impact resulting from human activities on GOA and BSAI groundfish resources, and more specifically, on sablefish/halibut stocks under consideration here, is fishing. Directed sablefish/halibut fishing as well as bycatch in other fisheries such as the groundfish fisheries is assessed yearly and corrected appropriately through yearly stock assessment activities, and through the formulation of overfishing levels (OFLs), acceptable biological catches (ABCs), annual catch limits (ACLs), and total allowable catches (TACs). These determinations and actions are all documented in the yearly SAFE report compiled by ADF&G, NMFS and NPFMC scientists (e.g., 2020 SAFE; NPFMC, 2020a NPFMC, 2020b).

Evidence Basis: *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.*	☑

EVIDENCE:

References cited above and in the evidence sections of Supporting Clause 12.9.

References:

Aydin, K., S. Gaichas, I. Ortiz, D. Kinzey, and N. Friday. 2007. A comparison of the Bering Sea, Gulf of Alaska, and Aleutian Islands large marine ecosystems through food web modeling. NOAA Tech. Memo. NMFS-AFSC-178. 298 p. https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-178.pdf

Bass, R.E., A. I. Herson, and K. M. Bogdan. 2001. The NEPA BOOK: A step-by-step guide on how to comply with the National Environmental Policy Act. 2001 (Second) Edition. Solano Press Books. ISBN 0-923956-67-0 http://www.solano.com/old_site_02/oldsite/bookinfo_nepa.htm

CEQ. 2007. A Citizen's Guide to the NEPA. Having Your Voice Heard. Council on Environmental Quality, Executive Office of the President. December 2007. 45 p. https://ceq.doe.gov/get-involved/citizens_guide_to_nepa.html

NPFMC ,2020a Fishery Management Plan for Groundfish of the Gulf of Alaska. North Pacific Fishery Management Council, November 2020 152 p. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

NPFMC, 2020b. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. North Pacific Fishery Management Council, November 2020. 175 p. https://www.npfmc.org/bering-seaaleutian-islands-groundfish/

SAFE 2020 Assessment of the Sablefish Stock in Alaska NMSF AKFSC 257 pp. https://apps-afsc.fisheries.noaa.gov/refm/docs/2020/sablefish.pdf

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:	Full Conformance

12.2.11.	**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.**	
(10 = Full Conformance; 7 = Minor NC; 4 = Major NC; 1 = Critical NC)		
Non-conformance Number (if applicable):		

9.5.1.14 Supporting Clause 12.3.

12.3.	**The role of the *stock under consideration* in the food web shall be considered, and if it is a key prey species[38] in the ecosystem, management objectives and measures shall be in place to avoid severe adverse impacts on dependent predators.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑
EVIDENCE: There is ongoing assessment and monitoring of the roles of Alaska Sablefish and halibut in the food web. As described in the evidence for Supporting Clause 5.1.2, annual stock assessment and fishery evaluation (SAFE) reports consider all sources of fishing mortality on sablefish/halibut stocks, including discards, unobserved mortality, incidental mortality, unreported catches, and catches in other fisheries.		
Current status/Appropriateness/Effectiveness: *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.*		☑
EVIDENCE: Alaska Sablefish and halibut are not typically categorized as a key prey species for any single marine predator. Several comprehensive studies of the food web in various regions of the northern Pacific Ocean have not indicated that sablefish are heavily utilized by any predator. Predation on Alaska Sablefish and halibut, especially by marine mammals, is apparently low, except in cases where the fish were attached to fishing gear. This is understandable, because adult sablefish and halibut are large, active animals that would be difficult to capture in open water. Also, their bottom dwelling habits, generally in offshore areas, make them less accessible to predation than schooling, pelagic species.		
Evidence Basis: *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.*		☑
EVIDENCE: High quality evidence is available and sufficient to demonstrate that the food web roles of the sablefish/halibut stocks under assessment have been adequately considered by management and these stocks are not key prey species. Evidence includes: - Annual SAFE (NPFMC, 2020[39]) - Alaska Marine Mammal stock assessments (Muto *et al*., 2021) - Annual Ecosystem Status Reports for GOA, EBS and AI (Ferris and Zador,2020; Siddon, 2020; Ortiz and Zador, 2020)		
References:	Ferris B and S. Zador Ecosystem Status Report 2020 Gulf of Alaska https://apps-afsc.fisheries.noaa.gov/REFM/docs/2020/GOAecosys.pdf Muto, M. M., Helker, V. T., Delean, B. J., Young, N.C., Freed, J.C., Angliss, R. P., Friday, N.A., Boveng, P. L., Breiwick, J.M., Brost, B. M., Cameron, M. F., Clapham, P. J., Crance, J. L., Dahle, S. P., Dahlheim, M.E.,	

[38] See Appendix 1 of Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in Alaska Version 2.0 May 2018.
[39] https://www.npfmc.org/library/safe-reports/

12.3.	**The role of the *stock under consideration* in the food web shall be considered, and if it is a key prey species[38] in the ecosystem, management objectives and measures shall be in place to avoid severe adverse impacts on dependent predators.**
	Fadely, B. S., Ferguson, M.C., Fritz, L.W., Goetz, K.T., Hobbs, R.C., Ivashchenko, Y.V., Kennedy, A. S., London, J.M., Mizroch, S.A., Ream, R.R., Richmond, E.L., Shelden, K.E.W., Sweeney, K.L., Towell, R.G., Wade, P.R., Waite, J.M., and Zerbini, A.N. 2020. Alaska marine mammal stock assessments, 2020. July, 2021. U.S. Department. Commerce., NOAA Technical. Memorandum. NMFS-AFSC-421, 407 p. https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region. Ortiz, I., and S. Zador. (Eds.) 2020. Ecosystem Status Report 2020 Aleutian Islands. Nov 17, 2020. https://www.fisheries.noaa.gov/alaska/ecosystems/ecosystem-status-reports-gulf-alaska-bering-sea-and-aleutian-islands Siddon, E. (Ed.) 2020. Ecosystem Status Report 2020 Eastern Bering Sea. December 2020. https://www.fisheries.noaa.gov/resource/data/ecosystem-status-report-2020-eastern-bering-sea.

	Starting score		Number of EPs NOT met			Overall score
Numerical score:	**10**	– (	**0**	x 3)	=	**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):	

9.5.1.15 Supporting Clause 12.4.

12.4.	**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[40].**
Relevance:	Relevant

Evaluation Parameters	Met?
Process: *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[41]. 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.*	☑
EVIDENCE: The food web functions of the sablefish and halibut stocks under discussion are reasonably well understood, and neither are regarded as important prey species. Sablefish and halibut are not believed to be widely consumed by any predator, according to several thorough studies of the food web in various parts of the northern Pacific Ocean. Except in instances where the fish were tied to fishing gear, it appears that marine animals rarely prey on Alaskan halibut and sablefish. This seems reasonable given that adult sablefish and halibut are both large, active species that would be challenging to catch in open water. Additionally, they are less vulnerable to predators than schooling pelagic species because of their bottom-dwelling habits, which are typically found in offshore settings. As a result, the Council does not list sablefish/halibut stocks as forage species for groundfish (e.g., BSAI Groundfish FMP; NPFMC, 2020), and no predators are known to have an obligate or dependent relationship (*sensu* Pikitch *et al*., 2012) with sablefish/halibut stocks. Accordingly, the research that is now available suggests that the sablefish and halibut stocks being considered here are not important prey species whose disappearance could negatively affect reliant predators. However, there are procedures within the Council process to establish outcome indicators commensurate with avoiding extreme harmful impacts on dependent predators. For instance, the BSAI Groundfish FMP and Salmon FMP both address possible effects to dependent predators through the use of outcome indicators. To prevent negative effects on dependent predators, there are continuing efforts for monitoring outcome indicators.	
Current status/Appropriateness/Effectiveness: *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.*	☑
EVIDENCE: Outcome indicators for sablefish/halibut predators are in place and used for ongoing monitoring programs as evidenced by the annual publication of stock assessment and fishery evaluation (SAFE) reports, marine mammal stock assessment reports, and ecosystem status reports.	
Evidence Basis: *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.*	☑

[40] See Appendix 1 of Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in Alaska Version 2.0 May 2018.

[41] General harvest guidelines based on Lenfest report: "in fisheries with an intermediate level of information (which will include most well managed forage fisheries), there must be at least 40% of virgin or unfished biomass (B_0) left in the water, and fishing mortality should be no higher than 50% of F_{MSY}. Low information fisheries should leave at least 80% of B_0 in the water. High information fisheries (which have a high information not just on the fished stock, but the full ecosystem), may exceed these reference points if justified by the science, but in no case should fishing mortality exceed 75% of F_{MSY} or biomass fall below 30% of B_0. Link: http://www.lenfestocean.org/~/media/legacy/lenfest/pdfs/littlefishbigimpact_revised_12june12.pdf?la=en.

12.4.	**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[40].**

EVIDENCE:

Examples of reports that are relevant to outcome indicators for avoiding adverse impacts to dependent predators include:

- 2020 Alaska marine mammal stock assessment report (Muto *et al*., 2021)
- Ecosystem Status Report 2020 Eastern Bering Sea (Siddon, 2020)
- Ecosystem Status Report 2020 Gulf of Alaska (Ferris and Zador ,2020)

References:

Ferriss B and S. Zador Ecosystem Status Report 2020 Gulf of Alaska https://apps-afsc.fisheries.noaa.gov/REFM/docs/2020/GOAecosys.pdf

Muto, M. M., Helker, V. T., Delean, B. J., Young, N.C., Freed, J.C., Angliss, R. P., Friday, N.A., Boveng, P. L., Breiwick, J.M., Brost, B. M., Cameron, M. F., Clapham, P. J., Crance, J. L., Dahle, S. P., Dahlheim, M.E., Fadely, B. S., Ferguson, M.C., Fritz, L.W., Goetz, K.T., Hobbs, R.C., Ivashchenko, Y.V., Kennedy, A. S., London, J.M., Mizroch, S.A., Ream, R.R., Richmond, E.L., Shelden, K.E.W., Sweeney, K.L., Towell, R.G., Wade, P.R., Waite, J.M., and Zerbini, A.N. 2020. Alaska marine mammal stock assessments, 2020. July, 2021. U.S. Dep. Commer., NOAATech. Memo. NMFS-AFSC-421, 407 p. https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region

NPFMC ,2020a Fishery Management Plan for Groundfish of the Gulf of Alaska. North Pacific Fishery Management Council, November 2020 152 p https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

NPFMC, 2020b. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. North Pacific Fishery Management Council, November 2020. 175 p. https://www.npfmc.org/bering-seaaleutian-islands-groundfish/.

Siddon, E. (Ed.) 2020. Ecosystem Status Report 2020 Eastern Bering Sea. December 2020. https://www.fisheries.noaa.gov/resource/data/ecosystem-status-report-2020-eastern-bering-sea

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):					

9.5.1.16 Supporting Clause 12.5.

12.5.	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).	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *The appropriate regulations have been implemented.*		☑
EVIDENCE: MARPOL 73/78 (the "International Convention for the Prevention of Pollution From Ships") is one of the most important treaties regulating pollution from ships[42]. Six Annexes of the Convention cover the various sources of pollution from ships and provide an overarching framework for international objectives. In the U.S., the Convention is implemented through the Act to Prevent Pollution from Ships (APPS). Under the provisions of the Convention, the United States can take direct enforcement action under U.S. laws against foreign-flagged ships when pollution discharge incidents occur within U.S. jurisdiction.		
Current status/Appropriateness/Effectiveness: *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).*		☑
EVIDENCE: MARPOL 73/78203,204(the "International Convention for the Prevention of Pollution from Ships") is one of the most important treaties regulating pollution from ships[43]. Six Annexes of the Convention cover the various sources of pollution from ships and provide an overarching framework for international objectives. In the U.S., the Convention is implemented through the Act to Prevent Pollution from Ships (APPS). Under the provisions of the Convention, the United States can take direct enforcement action under U.S. laws against foreign-flagged ships when pollution discharge incidents occur within U.S. jurisdiction. When incidents occur outside U.S. jurisdiction or jurisdiction cannot be determined, the United States refers cases to flag states, in accordance with MARPOL. These procedures require substantial coordination between the Coast Guard, the State Department, and other flag states, and the response rate from flag states has been poor. Different regulations apply to vessels, depending on the individual state.		
Evidence Basis: *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.*		☑
EVIDENCE: The U.S. has introduced and enforces laws and regulations based on MARPOL as evidenced by: - U.S. federal law (Act to Prevent Pollution from Ships, APPS; 33 U.S.C. §§1905-1915)[44]. - Established protocols between US EPA and USCG for managing enforcement of Annex VI of MARPOL[45]. - A public record of criminal prosecutions of vessel pollution cases by the U.S. Department of Justice (penalties exceeded $200 million over a recent 10-year period.		
References:		
Numerical score:	Starting score – Number of EPs <u>NOT</u> met x 3 = Overall score	

[42] https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx
[43] https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx
[44] https://uscode.house.gov/view.xhtml?path=/prelim@title33/chapter33&edition=prelim
[45] https://www.epa.gov/enforcement/marpol-annex-vi-and-act-prevent-pollution-ships-apps#:~:text=the%20United%20States.-,Annex%20VI%20Significant%20Provisions,1901%2D1905%20(APPS).

12.5.	**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).**					
		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):						

9.5.1.17 Supporting Clause 12.6.

12.6.	Research shall be promoted on the environmental and social impacts of fishing gear especially on the impact of such gear on biodiversity and coastal fishing communities.	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *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.*		☑

EVIDENCE:

Sablefish and Halibut

In general, the NPFMC has run into contentious difficulties during the management of groundfish resources process, including conflicting societal and economic aims for sustainable fishery management, including preservation of the resource's long-term health and yield optimization. The economic and socioeconomic aspects of Alaska's fisheries and communities are described in portions of their FMPs. The NPFMC, IPHC, and NMFS AKFSC also set catch levels for each species or group of species of groundfish based on the most up-to-date biological, ecological, and socioeconomic data. In accordance with the Regulatory Flexibility Act (RFA), the MSA, the NEPA, the Endangered Species Act, and other relevant regulations, socioeconomic data collecting, and economic analysis are frequently incorporated. An annual Economic Status Report of the Groundfish Fisheries in Alaska is produced by the AKFSC's Economic and Social Sciences Research Program**.** This program primary mission to provide economic and sociocultural information that will assist NMFS in meeting its stewardship responsibilities.

Current status/Appropriateness/Effectiveness: *There is evidence for this research, and is it considered appropriate for overall fisheries management purposes.*	☑

EVIDENCE:

Sablefish and Halibut

In general, during the management of groundfish resources process NPFMC, NMFS AKFSC and NOAA Alaska regional office have encountered controversial issues on marine resources conservation 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. On their FMPs there are sections describing the economic and socioeconomic characteristics of the fisheries and communities in Alaska(NPFMC 2020a; NPFMC 2020b). Catch levels for each groundfish species or species group that are set by NPFMC and IPHC are based on the best biological, ecological, and socioeconomic information available. Socio-economic data collection and economic analyses are often included under the Regulatory Flexibility Act (RFA), the MSA, the NEPA, the Endangered Species Act, and other applicable laws. AFSC's Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska (Fissel *et al.,* 2020). The primary mission of the Economic and Social Sciences Research Program is to provide economic and sociocultural information that will assist NMFS in meeting its stewardship responsibilities[46]. Activities in support of this mission include:

- Collecting economic and sociocultural data relevant for the conservation and management of living marine resources.
- Developing models to use that data both to monitor changes in economic and sociocultural indicators and to estimate the economic and sociocultural impacts of alternative management measures.
- Preparing reports and publications.
- Participating on NPFMC, NMFS, and inter-agency working groups.
- Preparing and reviewing research proposals and programs.
- Preparing analyses of proposed management measures.
- Assisting Alaska Regional Office and NPFMC staff in preparing regulatory analyses.
- Providing data summaries.

Many of these are cooperative activities conducted with other scientists at the Center, other NMFS sites, the NPFMC, other natural resource agencies, and universities. Currently, the research topics being addressed cooperatively by program staff and scientists at the University of Washington, the University of Alaska, and the University of California, Davis include regional economic impact

[46] https://www.fisheries.noaa.gov/contact/economic-and-social-sciences-research-program

12.6.	Research shall be promoted on the environmental and social impacts of fishing gear especially on the impact of such gear on biodiversity and coastal fishing communities.

models, behavioral models of fishing operations, indicators of economic performance, and the non-market valuation of living marine resources.

NOAA Auke Bay lab have been doing continuing research in collaboration with University of Alaska and ADFG on determining effects of fishing gear on benthic habitats[47]

Theses research individual projects fall into three major categories:

1) effects of specific gear on specific habitat,
2) linkage of fishing induced disturbance to population dynamics of commercial and non-commercial species,
3) mitigation-related studies.

Evidence Basis: *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.*	☑

EVIDENCE:

The body of published research on social and environmental impacts of fishing gear in Alaska is sufficient to substantiate that research, appropriate for overall fisheries management purposes, has been and continues to be actively promoted. See examples referenced above and in the literature cited therein.

References:	Fissel, B., M. Dalton, B. Garber-Yonts, A. Haynie, S. Kasperski, J. Lee, D. Lew, C. Seung, K. Sparks, M. Szymkowiak, and S. Wise. 2020. "Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, 2019", NPFMC, November, 2020. https://www.fisheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-bering-sea-aleutian-islands NPFMC, 2020a Fishery Management Plan for Groundfish of the Gulf of Alaska. North Pacific Fishery Management Council, November 2020 152 p. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf NPFMC, 2020b. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. North Pacific Fishery Management Council, November 2020. 175 p. https://www.npfmc.org/bering-seaaleutian-islands-groundfish/.

Numerical score:	**Starting score**			**Number of EPs NOT met**					**Overall score**
	10	**–**	**(**	**0**	**x**	**3**	**)**	**=**	**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):	

[47] https://www.fisheries.noaa.gov/about/auke-bay-laboratories

9.5.1.18 Supporting Clause 12.7.

12.7.	**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.**	
Relevance:	Relevant	
Evaluation Parameters		**Met?**
Process: *There is a process available for the consideration of MPAs as appropriate, as a tool for management.*		☑
EVIDENCE: The process for consideration of MPAs as a management tool is established at State,[48] Federal[49] and Council[50] levels.		
Current status/Appropriateness/Effectiveness: *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.*		☑
EVIDENCE: In Alaska, MPAs have been widely employed as management tools by state and federal management organizations as well as NPFMC. Brock (2015) reports that 95 MPAs have been established in Alaska, totaling 2,737,588 km^2 over 4 significant ecoregions. It is not unexpected that different MPAs have different specific conservation aims given the sheer number of MPAs. However, the majority of Alaska's MPAs were created with the intention of safeguarding fish stocks and fisheries and/or protecting marine biodiversity and sensitive or important habitats. To safeguard benthic invertebrates and lessen the possibility of damaging effects on sensitive habitat, the NPFMC, for instance, notes that large sections of the North Pacific have been permanently prohibited to groundfish trawling and scallop dredging. These marine protected zones operate in many ways as marine reserves and make up a sizable percentage of the continental shelf. Additionally, fisheries restrictions enforced in nearshore areas to lessen encounters with Steller sea lions have an additional benefit of lessening habitat damage as well.		
Evidence Basis: *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.*		☑
EVIDENCE: NOAA and the Department of the Interior have partnered to create the National Marine Protected Areas Center. On its website, the Center offers an interactive MPA Inventory that lists all MPAs in US waters, their locations, and their functions. This extensive geographic database combines information from state and federal MPA programs with data that is publicly available. A map of MPAs in Alaska[51]212 is shown in (Figure 19).		

[48] https://www.adfg.alaska.gov/index.cfm?adfg=conservationareas.marineprotected
[49] https://marineprotectedareas.noaa.gov/aboutmpas/mpacenter/
[50] https://www.npfmc.org/habitat-protections/
[51] http://seabank.org/unplug-and-connect-with-your-soul/

12.7.	**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.**

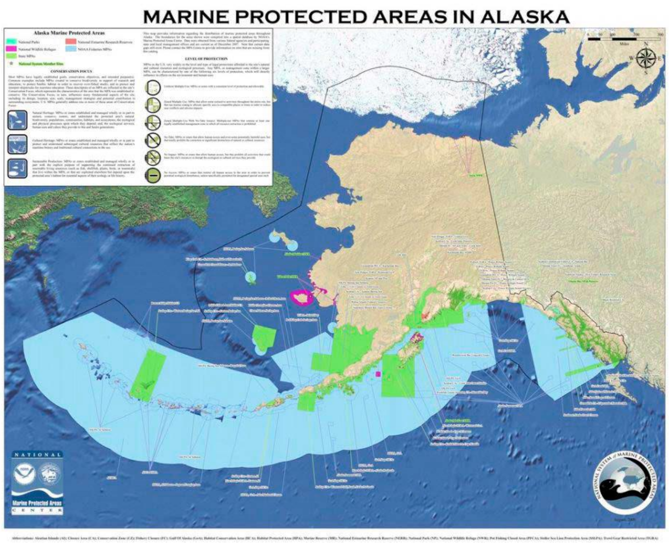

Figure 19. Marine Protected Areas in Alaska.

References:	Brock, R. 2015. Representativeness of Marine Protected Areas of the United States. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Protected Areas Center, Silver Spring, MD. 31 p. https://www.coris.noaa.gov/activities/mpa_us/							
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):								

9.6 Non-conformances and associated Corrective Actions

The Assessment Team have not identified any non-conformances.

9.7 Recommendations

There were no recommendations from the assessment team.

10 References

ADFG News Release: 2021 Northern Southeast Inside (NSEI) Subdistrict Sablefish Fishery Annual Harvest Objective Correction: https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1297213194.pdf

ADFG News Release: 2021 Southern Southeast Inside Subdistrict Sablefish Fishery: https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1261281340.pdf.

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IPHC Fishery Regulations 2022: https://www.iphc.int/uploads/pdf/regs/iphc-2022-regs.pdf.

IPHC Harvest Strategy Policy (2019): https://iphc.int/uploads/pdf/hsp/iphc-2019-hsp2019.pdf.

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IPHC Report of the 98th Session of the IPHC Annual Meeting (AM098): https://www.iphc.int/uploads/pdf/am/am098/iphc-2022-am098-r.pdf.

IPHC Rules of Procedure (2022): https://iphc.int/uploads/pdf/basic-texts/iphc-rop-current.pdf.

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11 Appendices

11.1 Appendix 1 – External Peer Review

The RFM program requires that reports be subjected to review by reviewers external to the Certification Body. Based on the technical expertise required, a team of Peer Reviewers was selected. Peer Reviewers were asked to focus on specific parts of the assessment depending on their particular areas of expertise but were also asked to provide comments elsewhere where they saw fit to do so. The team of Peer Reviewers for this assessment was made up of:

- Reviewer 1
- Reviewer 2

Note. Peer reviewer information has been removed and peer reviews are unattributed in this report.

11.1.1 Peer Reviewer 1

11.1.1.1 General comments

Peer Reviewer Comments	Assessment Team Response
General Comments	
Please provide a short summary of the key comments of the peer review and a statement on whether or not you are in broad agreement with the conclusions reached. Please refer to both positive and critical aspects discovered during the review (circa. 0.5 page). Thank you for the opportunity to have reviewed the report documenting the "AK RFM Halibut and Sablefish REASSESSMENT". The Assessment Team (AT) presented the material in a careful and comprehensive manner. Comprehensive information was provided on: the life history/fishery spatial area and fishing methods, management history and operational characteristics, overall stock assessment process, status determination and socio-economic value. This background material was integral to reviewing the report in the context of each of the RFM standard criteria. In nearly all of the sub-sections sufficient content was provided by the AT, thus making the determination of whether or not the evaluation parameters (Eps) were satisfied or not, very easy. There were only a very few situations (sub-clauses) where added content would have facilitated the review, however this did not alter any of the AT scores. The one case where added content would enhance the report relates to determining reference points- see AK halibut section. More recently, since the 2018 assessment, interim reference points have been set using recent biological conditions where observations of lower recruitment have been observed. This is considered precautionary and worth mentioning in the report; including content in section 7 on this would be appropriate. Additionally, the attention to detail both in developing the EPs and establishing the evidence of satisfaction (or not) is worth mentioning- the AT did an excellent job succinctly summarizing relevant documents that supported the sub-clauses and in nearly all cases, the needed references were provided. An overall excellent quality job of preparing the report. Thank you.	Thank you.

11.1.1.2 Non-conformances raised (if applicable) – Peer Reviewer 1

Peer Reviewer Comments	Assessment Team Response
Background Section	
Please provide a short commentary on any non-conformances raised and the appropriateness or otherwise of proposed corrective actions. Please refer to both positive and critical aspects discovered during the review (circa. 0.5 page). N/A No non-conformances were raised.	No comments.

11.1.1.3 Scoring element review – Peer Reviewer 1

Please provide comment as required on each clause or leave blank as appropriate—again here, please refer to both positives and negatives.

11.1.1.3.1 Section A: The Fisheries Management System

Clause	Peer Reviewer Comments	Assessment Team Response
1. Structured and legally mandated management system		
1.1.	The information provided supports that a strong and effective management system is in place for both sablefish and halibut. Adequate background was provided detailing the management sources (federal, state agencies and international convention), the changes in the system over time and how the system operates currently, including a detailed listing of recent regulatory provisions and changes in rules, including reasoning for such changes. The system is both relevant and appropriate for long term sustainability of the resources and evidence support it is effective. All Scoring agreed.	No comment.
1.2.	Reviewer agrees with Assessment team (AT)' supporting comments that management measures are taking into consideration the vital ingredients (stock trends in abundance, removals, biological inputs, etc.) in ensuring the resources will be sustainable long term. Also, sufficient input that the management system/process is proactive in considering how such biological process are working/changing temporally and spatially (e.g., migration) and how this will affect distributing exploitation in view of appropriate harvest strategy. All Scoring agreed. Two minor notes: This reviewer would like to see text added as to what current strategy is for sablefish (i.e., reference point of SPR40 or SPR35? Additionally, this reviewer would like the AT to expand on how the harvest strategy is balancing ecosystem needs as relates habitat; this additional support will provide even stronger support that the harvest strategy is in total considering all the important components needed to achieve its objectives.	No comment. This is still a bit of a moving target. Noted for future report.
1.2.1.	More information needed on how management system incorporates feedback from stakeholders. While reviewer feels there is reasonable support provided that the system does incorporate stakeholder input (i.e., reviews conducted every 3 years or annually) but more input needed on exactly how stakeholders' input is obtained (i.e., public comment periods, brochures, etc.) would enhance the score. The link provided for the ADFG board meeting is broken and the NPFMC link is to the full Council archive of meeting but not to the actual audit report. Score agreed.	Agreed. Hopefully more public information will be available in the near future. Link re-established.
1.3.	Sufficient information was provided supporting that the management system is collaborative among all the relevant groups and that as implemented is currently working. The strategy ensures a clearly delineated system is in place that takes into account all the relevant components needed to conduct the various reviews at each step and make necessary adjustments, with collaborative inputs. All Scoring agreed.	No comment.
1.3.1.	The long-term objectives are clear, and systems are in place that provision for objective review in a structured manner; such reviews evaluate the necessary components of the science (data inputs, etc.), evaluate assessment	No comment.

Clause	Peer Reviewer Comments	Assessment Team Response
	results and act accordingly to make amendments as needed. The strategy allows for flexibility and considerations of the multi diverse group of stakeholders involved. All Scoring agreed.	
1.4.	N/A	
1.4.1	Review agrees with score noting demonstrable support provided.	No comment.
1.5.	Score agreed. Sufficient evidence exists supporting that the management system strategy is collaborative with respect to the critical components leading to a healthy resource. These collaborations have been ongoing over many years and are continuously improved and relate to a diverse set of topics relating to data quality and research needs, concordance on rules and regulatory needs to ensure equity to stakeholders amongst other fishery aspects. The collaborations and various initiatives are diverse spanning state and federal agencies and international as well as at the community level. All Scoring agreed	No comment.
1.6.	Clear and sufficient information was provided documenting how the management activities amongst the different agencies are financed presently and also that management fiscal needs relating to data/research needs are supported additionally through cost recovery systems enacted through regulation. All Scoring agreed.	No comment.
1.6.1.	N/A	
1.7.	The management system has checks and balances in place to ensure continual updating of the process; that all the parts are consistently reviewed to produce the best science and quantify impacts on target stock and also non-target species and other parts of the ecosystem (e.g., habitat, ETP species). The system is proactive seeking to identify appropriate harvest levels for the target species while mitigating any negative impacts on other ecosystem components and activities towards these goals are carried out in a timely manner. All Scoring agreed.	No comment.
1.8.	The different parts of the management system including all players (stakeholders/management agencies), information considered, reviewed and the endpoints are all well documented by all agencies and readily available to all involved. Materials to be reviewed are available in a timely manner. Multiple meetings are held annually across the 3 agencies for reviewing, proposing new/modified rules and decision making. This transparency is well documented giving the overall management system a high level of credibility as relates information content and how decisions are made and impacts of such decisions. Stakeholders are routinely consulted using a diverse array of outreach methods (written minutes of meetings, flyers, publications, websites, newsletters, press releases, blogs and social media feeds, etc.) regarding research needs and rulemaking, and objections or challenges are considered and dealt with; a system exist for handing objections which is clear and detailed. All Scoring agreed.	No comment.
1.9.	N/A	
2. Coastal area management frameworks		
2.1.	Sufficient support that an appropriate strategy exists ensuring coastal area management concerns are in place was provided; it is relevant, current and fully developed. Relevant federal, state, and tribal, and other groups participate consistently. All scoring agreed.	No comment.
2.1.1.	Adequate support that a mechanism exists for carrying out the required coordination among primary stakeholders (management agencies) to ensure that the coastal management systems are successful exist.	No comment.

Clause	Peer Reviewer Comments	Assessment Team Response
	Checkpoints exist to identify bottlenecks and issues. Although all EPs components were met the box for evidence basis was not checked. All scoring agreed.	
2.1.2.	As with the basic management framework a system is in place provisioning for required levels of resources (management, assessments, research) backing the management infrastructure relating to 'coastal fisheries management', a significant portion of the resources are covered through well-established cost recovery systems that have a lengthy period of coverage. The level of support was sufficient to demonstrate this. All scoring agreed.	No comment.
2.2.	The federal agencies are the primary entity responsible for ensuring information is shared/available and a process for involving and consulting with relevant stakeholders (fishery/communities) involving coastal resources. It is current and appropriate; a high level of documentation exists to support the system is working/efficient and involves the primary resource users. All scoring greed.	No comment.
2.3.	There is a process in place to deal with user conflicts- this is relevant; most conflicts are handled through the NEPA process; the process is open and evidence that it is working was provided. Both federal and state managers are involved and participate in coordinating conflict issues. The process is open and transparent, well documented and flexible. All scoring agreed.	No comment.
2.4.	All scoring agreed.	No comment.
2.5.	Evidence that the economic, social, and cultural value of coastal resources are considered by federal and state managers was sufficient, both relevant and the level of evaluation is appropriate. Evidence that these analyses exist are well documented. All scoring agreed.	No comment.
2.6.	Process/evidence and status/appropriateness/effectiveness evaluation parameters shown and supported; however, boxes not checked. All scoring agreed.	No comment.
2.7.	There are systems and current working plans in place that provision for alerting stakeholders of major environmental impacts (e.g., oil spills, introductions of invasive species) ahead of time. These are relevant and sufficient evidence was provided to support the effectiveness of such systems/plans to date. Such planning includes strategic plan that incorporate short/medium term initiatives towards informing stakeholders and mitigating impacts. All scoring agreed.	No comment.
3. Management objectives and plan		
3.1.	The team provided sufficient information supporting that long term management is guided through a formal plan, the content which is based on the best scientific available advice. The plan has been developed collaboratively by relevant federal, state, and other groups (tribal, etc..); is current and routinely adapted as needed. Within the plan appropriate guidance criteria (guideposts) facilitate objectives that aim to ensure long-term sustainable resources according to precautionary principles. All scoring agreed.	No comment.
3.1.1.	Processes are in place to ensure adverse impacts to ETP species are minimized; rules/guidance objectives work to achieve the process goals. Documentation and support on the process exists and supports the relevance/performance goals. The process is comprehensive and mechanisms towards long term protection of ETP species include: research activities, harvest caps, fishery incentive programs to minimize/reduce bycatch, gear technological initiatives, identifying/quantifying critical habitats, etc. All scoring agreed.	No comment.

Clause	Peer Reviewer Comments	Assessment Team Response
3.1.2.	The AT provided ample support that management objectives exist that consider the need to quantify EFH of the target species and also identify critical habitat of other species impacted by the target fishery (e.g., vulnerable species). The objectives are reviewed periodically; the mechanisms employed to reach plan objectives include regulatory measures, quantifying status of ETP species, as well as research to improve early life history needs (habitat) for ETP and all groundfish species. Both federal and state agencies are involved. All scoring agreed.	No comment.
3.1.3.	For the AK sablefish/halibut fisheries there are management objectives that seek/aim to prevent adverse impacts on ecosystem structure which would be irreversible long term; these are governed by a comprehensive set of multiple ecosystem plans including: federal/stakeholder developed ecosystem plan, Bering Sea/Aleutian plans. Within the plans, considerations towards understanding impact on users/communities are included. Scoring agreed.	No comment.
3.2.	N/A	
3.2.1.	Support showing that a system is in place by managers (federal and state) which quantifies/assesses fleet capacity and exploitation levels such to ensure such levels are not producing an overfished stock nor leading to long-term unsustainable resources is in place. Documentation of such systems is sufficient and relevant, and compliance is effected through the multiple FMPs and their objectives. All scoring agreed.	No comment.
3.2.2.	Support is evidence that fishery capacity (and thus economic capacities) is controlled through multiple mechanisms all implemented/effected through the management plans. The goals are relevant towards ensuring long-term sustainable fisheries and provision for flexibilities, in implementation of timing (i.e., in-season controls). All scoring is agreed.	No comment.
3.2.3.	All stakeholders, including small scale artisanal fisheries have the opportunity to be part of the management process. Federal/state manager's involve small sale fishers during the consultative process and in a transparent way. All scoring agreed.	No comment.
3.2.4.	Management objectives through the multiple ecosystem plans, provision for a plan/process which aims towards ensuring that biodiversity of the ecosystem is maintained. These plans address 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 speciesAll scoring agreed.	No comment.

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

Clause	Peer Reviewer Comments	Assessment Team Response
4. Fishery data		
4.1.	More than adequate support that relevant critical inputs needed to inform removal of target stock is available for stock condition evaluation and additionally to evaluate impact of directed fisheries on non-target species. Systems exists that indicate data are also of good quality and sufficient in establishing enough time period with which to estimate stock dynamics over time and space. Further, good documentation was provided to base this reasoning on and in addition, the appropriate aggregation of data in time / space was made. All Scoring supported	No comment.
4.1.1.	The data collection methods/protocols for establishing time series of catch and fishing effort are sufficient for these stocks; procedures allow for continuous updates and reviews thus leading to best available science for use in assessment, monitoring and evaluation of management objectives. Ample evidence exists to support that the various data needed for stock evaluation are both timely and of good quality. This evidence includes a diverse set of assessment documents routinely updated and made available for review. All Scoring supported	No comment.
4.1.2.	N/A	
4.2.	Clear and detailed support that an observer system exists is provided including provisions that support high quality of the data and its relevance towards supporting research needs and ability to use in tracking compliance. All Scoring supported.	No comment.
4.2.1.	Adequate evidence was provided supporting that a quality system exists that provides estimates of catch for these resources, and recent time series of discards that can be used to estimate recent discard mortality. The system is regularly reviewed and modified as necessary and has good spatial and fleet (gear) coverages. As such- this component of mortality (discards) is adequately sampled and well documented at least for recent years- mid to late 1990's; levels of discards before the observer programs were implemented are unknown. Although a logbook program exists where self-reported catch data are available, information on discarding from this record or condition of discards was not discussed in the report and validation of these data is unknown. However, because the full history of discards cannot be quantified, there is uncertainty in the time series of discard mortality. However, the information that is available is considered sufficient to characterize the recent status of discard trends thus the confidence in recent status of the evaluation parameter (discard mortality) is not affected. Overall score agreed.	No comment.
4.3.	Sufficient support was provided indicating a system for data distribution exists is appropriate as relates management objectives and ensures considerations for confidentiality. All Scoring agreed.	No comment.
4.4.	All Scoring agreed.	No comment.
4.5.	Sufficient details were provided supporting that data on social, marketing and institutional aspects of these resources' fisheries is being collected and is document and available. The information is being used currently to monitor and recommend polices regarding these aspects of the fisheries. Scoring agreed.	No comment.

Clause	Peer Reviewer Comments	Assessment Team Response
4.6.	Adequate input was provided to support that management includes information content from traditional fisher knowledge and small scale (recreational/subsistence) fishery components in the assessment; it is relevant current and supported through documentation. Scoring agreed.	No comment.
4.7.	Evidence to support that research activities that are being conducted on these resources are in compliance with laws within each state exist and are documented as well as international laws. Scoring agreed.	No comment.
4.8.	N/A	
4.9.	N/A	
4.10.	N/A	
4.11.	N/A	
5. Stock assessment		
5.1.	A succinct summary of the institutional framework used to identify appropriate research and how it is used (i.e., for assessment use and status determination) including identification of main players (agencies) coordinating this research. Additionally, relevant procedures taking to update the research models, including reasoning for modifications and steps taken to reduce uncertainties and improve advice provided. All scoring agreed.	No comment.
5.1.1.	N/A	
5.1.2.	Research is conducted (collaboratively across all agencies and researchers) that provides BASI for stock assessment, monitoring and management. Research topics address primary stock assessment inputs (an uncertainties) as well as more recently other ecosystem considerations and considerations on resource impacts as relates climate changes. Outputs are clearly documented and made available to all stakeholders. As needed updates to research activities/plans are made and implemented. All research is implemented using standardized methodologies adopted through consultative processes and implemented by highly skilled field research teams. Scoring agreed.	No comment.
5.2.	Scoring agreed.	No comment.
5.3.	Adequate documentation was provided that supports a good and consistent stream of collaboration between the various groups (nations/agencies) as relates assessment and management and the collaborations are detailed in documents that are available. The projected new research aims to focus on better understanding of larger areas of uncertainty in the stocks (e.g., sablefish migration patterns) which if reduce will lead to more effective management and increase efficiencies in attaining optimum utilization of the resource, and lower overall risk. Scoring agreed.	No comment.
5.4.	Ample evidence exists that shows the 3 agencies are collaborating on research that aims to "*improve understanding of the biology, environment, and status of transboundary aquatic stocks".* The various projects/surveys are well documented and well supported by manager's agencies and resources exist that indicate they will be ongoing. Scoring agreed.	No comment.
5.5.	Here is good evidence showing that all data collected with regards to management objectives of these resources: is analysed/summarized and made available (with considerations for confidentiality conformance) and public	No comment.

Clause	Peer Reviewer Comments	Assessment Team Response
	through a variety of channels (documents describing assessment results/web portals/newsletters, etc.). Scoring agreed.	
6. Biological reference points and harvest control rule		
6.1.	Management reference point are in place that aim to achieve MSY or a proxy; these take into account the need to consider a lower exploitation rate as needed (e.g., to avoid negative consequences on other species (i.e., other groundfish and/or interacts with dependent predators). Managers have ability to modify TACs as needed where concerns for adverse impacts to stock health occur. Strong support given that both stocks are well above the limit reference points and that probability of recruitment overfishing is not occurring. All scoring agreed.	No comment.
6.2.	Reference points exist and are consistent with aim to avoid overfishing and are based on BASI; systems are in place to adjust to ensure overfishing does not occurred. Model outputs are well described and based upon sound statistical procedures, and peer reviewed and documentation is sufficient. All scoring agreed.	No comment.
6.3.	Support for data and analytical outputs supporting the current reference points was made. Scoring agreed.	No comment.
6.4.	A system and agreed response procedure is in place if reference points are exceeded as evidence by data availability, data quality, model outputs, and perceived (and supported) changes from environmental considerations. Scoring agreed.	No comment.
6.5.	Support given that there is a system/procedure in place to identify depleted resources, negative impacts on ecosystem healthy and that interventions can be made via an agreed recovery plan and in a timely manner. This plan includes both targeted stocks and their EFH as well as non-targeted resources. Scoring agreed.	No comment.
7. Precautionary approach		
7.1.	Adequate support that the two stocks are managed using a precautionary approach is provided; for sablefish this includes relevant guidance harvest levels for the inside fisheries all contributing to use of caution when setting harvest limits. The management and development of reference points includes relevant and sufficient data and assessment uncertainties and the methods used reflect international well tested standards. There is some disconnect between the discussion in section 6 (reference points) and section 7 as to stock status with respect to reference points; section 7 uses projection ssb; this reviewer feels the two sections should be aligned. The AT provided sufficient support that inside stocks of sablefish also are managed using a set of guidance harvest levels developed using science-based analyses of abundance. Also a bit of content on how the PA approach is applied by the NPFMC in setting ABC (see Dorn and Zadar DOI: 10.1080/20964129.2020.1813634) would be helpful. Scoring agreed.	Noted, we will align these sections.
7.1.1.	More than adequate support was given demonstrating the management plan in geared towards the PA approach and takes into account the major uncertainties in the systems (data, models, environment for target and non-target species and other components- habitats). Inclusion of the background reference document (Dorn and Zadar, on application of the risk table by managers in setting harvest levels would enhance the document. All scoring agreed.	Noted.
7.1.2.	N/A	
7.2.	N/A	

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

Clause	Peer Reviewer Comments	Assessment Team Response
8. Management measures		
8.1.	AT provided sufficient support that the two stocks are being managed through a framework that provisions for long term sustainability and optimum yield for the community this framework employs appropriate measures to ensure the objectives are carried out and successful. The management is collaborative across multiple agencies/user groups and is based on the BASI; Precautionary principles are applied consistently, and methods/procedures are consistently reviewed and adjusted as needed. All scoring agreed.	No comment.
8.1.1.	The management plan/strategies by law must incorporate cost implementation/impacts into evaluations of alternative/changing management practices, including impacts on communities/user groups and the ecosystem. Checkpoints are in place to ensure these requirements are carried out and documentation evidence is available. Scoring agreed.	No comment.
8.1.2.	The AT provided sufficient support that management objectives for this resource include and employ measures towards minimizing bycatch with the aim of application of PA and in accordance with international agreements (UN Fish Stocks) and engagement of best science and input from fishers' expert opinion. Scoring agreed.	No comment.
8.2.	The relevant FMPs and other regulations governing these fisheries ensure that destructive practices are not allowed in these fisheries and are not being used. Rules exist and enforcement data support this. All scoring agreed.	No comment.
8.3.	AT provided sufficient information supporting that a process (multi-collaborative) across the various management groups, federal/state/other - that ensure all relevant stakeholder to these fisheries are identified and have opportunity to participate. The modes of participation are variable, and the process is documented and transparent. The relevant parties having interest to these fisheries have official input and some a lengthy history of participation, many participate in research efforts/provide input into the rule making process and other critical topics involving the fisheries. Scoring agreed.	No comment.
8.4.	AT provided sufficient support documenting a process exist whereby fishing capacity (effort/exploitation) is both quantified (monitored) and a process whereby if needed adjustments are made to reduce capacity is in place and documented. Many of the adjustments are made using Plan amendments and also with the aim often to reduce mortality on a specific stock assessment (ex.- IFQ program which reduced total mortality as well as mortality on immature sablefish). Both federal and state agencies collect and maintain relevant vessel data in order to monitor capacity. Scoring agreed.	No comment.
8.4.1.	AT provided information documenting the management framework provisions for evaluation of relevant alternative management options that are based on BASI and such that consider socio-economic impacts on various user groups and communities. These are mandated at the federal level, conducted mainly through the NEPA process, and are transparent and well documented. At the international level (IPHC), there are official programs that examine the biological/socio-economic importance for the halibut stocks and any indicative changes in management. Scoring agreed.	No comment.

Clause	Peer Reviewer Comments	Assessment Team Response
8.5.	For both resources, halibut and sablefish, specific measures considered and agreed to technically for use in ensuring healthy long term sustainable stocks are well documented. These measures consider a wide-array of commonly used methods to achieve management goals- The FMPs provide sufficient information to gauge relevance and appropriateness for each stock; are well documented and the decisions to use one or more of these measures undergoes exhaustive evaluations, these deliberations are documented and available for all stakeholders to review and provide input. Scoring agreed.	No comment.
8.5.1.	Scoring agreed.	No comment.
8.6.	Scoring agreed.	No comment.
8.7.	Scoring agreed.	No comment.
8.8.	Scoring agreed.	No comment.
8.9.	Scoring agreed.	No comment.
8.10.	Scoring agreed.	No comment.
8.11.	Scoring agreed.	No comment.
8.12.	Scoring agreed.	No comment.
8.13.	Scoring agreed.	No comment.
9. Appropriate standards of fishers' competence		
9.1.	AT provided sufficient details supporting that in order to enter the QS and/or IFQ fisheries fishers must document high level of competence on the rules/regulations/fishing operation/practices including those skills and knowledge necessary to conduct good business practices and responsible fishing. All scoring agreed.	No comment.
9.2.	AT provided support of programs existing such that fishers involved in the halibut / sablefish fisheries have opportunities to become knowledgeable as relates the FAO's Code of Conduct for Responsible fisheries through information provided in the FMPs and other agency management documents. A link to the FAO CCR would be helpful. Scoring agreed.	No comment.
9.3.	AT provided sufficient evidence to support that record keeping is ongoing and such that it ensures fisher competence exists in accordance with national regulations. Scoring agreed.	No comment.
10. Effective legal and administrative framework		
10.1.	There are systems in place (national /state/ federal) for MCS, and evidence that the systems/rules/practice are working for these fisheries exist (and documentation). The strategies also are collaborative and have lengthy period of existence; approaches used are variable including: observer programs, boarding's, e-monitoring, season/trip limits/closures, size limits, VMS, etc. Scoring agreed.	No comment.
10.2.	At provided adequate information documenting systems are in place the regulate fishing vessels on these resources including various permitting systems, both fishing and processors. Scoring agreed	No comment.
10.3.	N/A	
10.3.1.	N/A	
10.4.	N/A	

Clause	Peer Reviewer Comments	Assessment Team Response
10.4.1.	N/A	
11. Framework for sanctions		
11.1.	At both federal and state level there are systems in place provision for sanctions as needed- the system is flexible/transparent and support that it is implemented fairly and expeditiously exists. Scoring agreed.	No comment.
11.2.	Sufficient support that the sanctioning system in place are in alignment with severity of violation was provided; the system uses flexibility in determining level of sanctions with the overall aim to promote compliance. Scoring agreed.	No comment.
11.3.	Reviewer notes that the available information suggests IUU is not a large concern with these fisheries, however the available sanction system should contribute to discouraging IUU. The systems in place for handling regular violations would carry over to IUU and in effect remove any economic benefits if made. Scoring agreed.	No comment.
11.4.	Reviewer notes this should not be scored as there are no foreign vessels licensed to fish in the US EEZ and the US does not fish in the high seas, thus an "N/A" is appropriate.	Agreed.

11.1.1.3.4 Section D: Serious Impacts of the Fishery on the Ecosystem

Clause	Peer Reviewer Comments	Assessment Team Response
12. Impacts of the fishery on the ecosystem		
12.1.	AT provided more than adequate support that impacts of environmental conditions (climatic, oceanographic, and ecological factors) are accounted for in the management of these fisheries. Numerous long term research initiatives exist that evaluate these impacts and these products/outputs are used in stock evaluations and in rule making; all are well documented and available to all stakeholders. These initiatives are at the International/state/federal level. Scoring agreed.	No comments.
12.2.	N/A	
12.2.1.	There are mechanisms for quantifying potential adverse impacts on the fisheries and on main associated (non-target) species; these are multiple in form (catch monitoring, observer programs, biological samples) and aim for ensuring impacts do not lead to irreversible trends (e.g., *with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible)* in these species. There are response mechanisms in place to mitigate potential effects if needed. The AT provide adequate summary information relating to bycatch to quantify main/minor non-target species within both fisheries. Scoring agreed.	No comments.
12.2.2.	There are mechanisms for quantifying potential adverse impacts on the fisheries and on minor associated (non-target) species; these are multiple in form (catch monitoring, observer programs, biological samples) and aim for ensuring impacts do not lead to irreversible trends (e.g., *with serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible)* in these species. There are response mechanisms in place to mitigate potential effects if needed. The AT provide adequate summary information	No comments.

Clause	Peer Reviewer Comments	Assessment Team Response
	relating to bycatch to quantify main/minor non-target species within both fisheries. Scoring agreed. Scoring agreed.	
12.2.3.	Adequate support 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, was provided. This includes summary data from catch monitoring and observer programs, fishery independent surveys and multipole stock status determinations of non-target/associated species. The information is ongoing and available for review. Scoring agreed.	No comments.
12.2.4.	Adequate support that there is a framework in place that functions to identify most probably adverse impacts on ETP species; this includes marine mammals and seabirds. The process is open/transparent. Rules and guidelines exist for ensuring protection of these species and are carried out at the federal level through multiple acts (ESA/Marine Mammal) with also input from state (ADF&G); recovery plans are developed where needed. For these fisheries, analyses are undertaken using observer data. Scoring agreed.	No comments.
12.2.5.	There are adequate methods in place to limit catch of ETP species in these fisheries. The systems are in place at federal and state level and enacted through FMPs or other regulations. Additionally, assessments conducted under the MMPA for some ETP species (e.g., stocks identified as strategic) provide quantitative evidence of status and mortality from various fisheries. Ecosystem status reports also supplement the FMPs and assessments. Scoring Agreed.	No comments.
12.2.6.	Sufficient information exists to support that systems are in place (federal, state, Council) that work with the aim to consider impact of the fisheries on habitat. The primary mechanism for identifying such impacts is through implementation of the EFH and HAPC acts. The AT also considered analytical outputs, from a fishing effects model, addressing habitat impacts for three habitat elements as required under RFM Standard (v 2.1). The information for sablefish was stronger than for halibut. The new information from ADFG (2023 letter) provided more quantification of the overall spatial footprint of the halibut fishery and support that this fishery is not producing an adverse impact on HAPCs. Scoring agreed.	No comments.
12.2.7.	Adequate support that critical information on the EFH for the halibut and sablefish stocks exist was provided; this mainly developed through FMPs (sablefish) and Councils (both species). Additionally, management objectives exist that aim to minimize adverse impacts on EFH and on HAPCs and to mitigate where necessary. Well-structured research initiatives are ongoing towards continuously updating EFH for these fisheries and adjusting/revising HAPC designations. Scoring agreed.	
12.2.8.	Scoring agreed.	No comments.
12.2.9.	Sufficient support exists documenting that the management system considers the most probable adverse impacts of the fisheries on the overall ecosystem, including the bait species which are not classified as an ETP. There are rules and guidelines in place and performance indicators for quantifying if objectives are being met or where issues/adverse impacts need addressing. Documentation exists through the annual ecosystem reports. Scoring agreed.	No comments.

Clause	Peer Reviewer Comments	Assessment Team Response
12.2.10.	There are available output indicators for quantifying whether management is considering the most probable impacts from these fisheries on the ecosystem. The support is derived from multiple reports including ecosystem status reports and annual stock assessment outputs/updates and is available. Scoring agreed.	No comments.
12.2.11.	Adequate information was provided to support that systems are in place to identify and consider most probably human adverse impacts on the fisheries. The systems/processes are well structured, and rules/guidance exists to deal with modifications as required to minimize/mitigate impacts. Scoring agreed.	No comments.
12.3.	The AT provided sufficient support that the role of these stocks in the food web is considered. Documentation exists (stock assessments/ecosystem reports) the analyses and data are based on the BASI and outputs are available to all. Scoring agreed.	No comments.
12.4.	These stocks are not considered key prey species in the region (mainly owing to their physical size and bottom habitat dwelling characteristics); however, there are mechanisms in place by which indicators are developed that would allow for quantifying the likelihood that adverse impacts on these stocks are occurring and could result in adverse impacts on any dependent predators Scoring agreed.	No comments.
12.5.	Evidence that states have implemented laws/rules whereby pollution from ships is prevented exists. Procedures/a process also exists for carrying out enforcement against violators. These laws/regulations are implemented by the US EPA, Coast Guard and follow the guidance of the MARPOL Convention. Evidence exists that documents how the process is working towards minimizing pollution via US DOJ documents. Scoring agreed.	No comments.
12.6.	AT provided more than sufficient input to document research is planned/ongoing/developed continually on social and environmental impacts of fishing gear in Alaska. The research is relevant/integral to advancing knowledge in these areas, collaborative and involves highly skilled groups of scientists/managers/stakeholders Scoring agreed.	No comments.
12.7.	Within the region, the use of MPAs has a lengthy background, and is well documented and spans across the multiple management agencies (federal/state/Council. That some 95 MPAs exist in the region also support the use of these as tools towards the aim of maintaining long-term healthy fisheries resources and their communities. Scoring agreed.	No comments.
13. Fisheries enhancement activities (remove if not applicable)		
13.1.	N/A	
13.1.1.	N/A	
13.2.	N/A	
13.2.1.	N/A	
13.3.	N/A	
13.4.	N/A	
13.5.	N/A	
13.6.	N/A	
13.7.	N/A	

Clause	Peer Reviewer Comments	Assessment Team Response
13.7.1.	N/A	
13.7.2	N/A	
13.7.3.	N/A	
13.8.	N/A	
13.9.	N/A	
13.10.	N/A	
13.11.	N/A	
13.12.	N/A	
13.13.	N/A	

11.1.1.4 Conclusion

<table>
<tr><th>Peer Reviewer 1</th><th>Assessment Team Response</th></tr>
<tr><td colspan="2">General Comments</td></tr>
<tr><td>Please provide an overall conclusion including:
▪ An indication of whether or not you believe the conclusion of the Assessment Team is appropriate conclusion based on the evidence presented in the assessment report.

This reviewer is in concordance with the Assessment team (AT) that the Alaska Pacific halibut and sablefish (black cod) commercial fishery “be certified against RFM Certification Program Fisheries Standard Version 2.1.”.

For each major section (A. Fishery management system; B. Science, stock assessment, and precautionary Approach; C. Management measures, implementation, and monitoring and control; and D. Serious impacts on the fishery and ecosystem) the team provided comprehensive details on the evaluation parameters being evaluated and the evidence supporting the parameter was being considered and addressed; or in a very few cases where minor concerns exited. Under each clause- the evaluation parameters were all relevant to the fisheries and the selected evidence types allowed determination if the parameters were being met or not.

Where non-conformances requiring corrective actions on behalf of the fishery have been raised, for each such non-conformance, please provide:
▪ An indication of whether or not you believe the non-conformances are appropriate.

There were no non-conformances raised by the AT; additionally the possible non-conformance relating to adverse impacts on the stocks and/or associated species due to lost traps was removed by the AT and support given included written comment from the applicant and also from management agency (ADFG).

▪ An indication of whether or not you believe the Corrective Action Plan is appropriate and likely to address the non-conformance within the specified timeframe.

N/A</td><td>No comments.</td></tr>
</table>

11.1.2 Peer Reviewer 2

11.1.2.1 General comments

Peer Reviewer 2	Assessment Team Response
General Comments	
There's very limited information in the preamble to show the management structures or describe the role of the federal and state organizations and how they work together, e.g., there's mention of the IPHC, NMFS and NPFMC having responsibility for managing the halibut fishery but little mention of how this is coordinated.	Information was added to show the management structures and description of role of federal and state organizations and how they work together on the
In many instances the EP "Evidence Basis" repeats part or in full the text that is provided in the description of what constitutes evidence basis but fails to elaborate on what the evidence is.	The EP evidence basis was checked again in the new version of the report
With respect to EP "Evidence Basis", rather than requiring the reader to look for examples of evidence in the hyperlinked references, could the Team actually cite some examples, and/or provide a description of what the hyperlinks take the reader to? This comment is applicable for many of the clauses throughout the report and should be corrected.	On the EP evidence basis. Examples were cited and the hyperlinks were provided with a description .
Also, it would help the reader if the references were written in the conventional way along with the hyperlink. In many instances, only the hyperlink is included, and these provide limited or no description of what they relate to.	On this version of the report references were written in the conventional way along with the hyperlink
It is not explicitly stated that either stock is transboundary, shared, straddling, highly migratory or high seas. These definitions usually relate to stocks that span or move between neighbouring coastal states EEZs. With respect to sablefish, the federal/state management component appears to have been used as the rationale for meeting one or a number of these stock definitions.	In the revised report it is explicitly stated that the halibut stock and sablefish are transboundary .
Editorial consistency throughout the report needs to be checked, e.g., referencing is inconsistent (sometimes there's a foot note, in many instances just a hyperlink, in other cases it is done in the conventional fashion and hyperlinks are included), in some instances Pacific halibut is the first species to be discussed in others it is sablefish, sometimes Sablefish and Halibut are capitalized in other instances they are not.	References were revised in a conventional fashion. References to sablefish and halibut was mentioned in order on this version of the report
In some instances, the text associated with the EP does not include the full supporting evidence. However, in combination, the text associated with all the EPS provides adequate evidence. Ideally, this requires some editorial changes with text from different EPs being moved to fit more appropriately with the respective EP and evidence requirements.	We disagree. This is primarily the result of how the SCs are defined. There is admittedly frequent duplication of the evidence that is needed across several SCs.
I think the differences between the management of the two stocks is different enough to have been better served by producing two separate reports.	We disagree. Both fisheries operate together targeting sablefish and halibut
Some additional information/evidence is required in order to fully justify some of the scoring.	The Peer reviewer 2 is not referring to which specific FCs/SCs

11.1.2.2 Non-conformances raised (if applicable) – Peer Reviewer 2

Peer Reviewer 2	Assessment Team Response
Background Section	
No NCs were raised by the Assessment team. I identify a clause (3.1) that I do not believe is met at this time but, with the formal adoption by the BOF of a new regulation will be met later this year. This should be checked with the client and/or ADFG.	No comments We did not agree with the peer reviewer 2 because his rationale is inmaterial.

11.1.2.3 Scoring element review – Peer Reviewer 2

Please provide comment as required on each clause or leave blank as appropriate—again here, please refer to both positives and negatives.

11.1.2.3.1 Section A: The Fisheries Management System

Clause	Peer Reviewer Comments	Assessment Team Response
1. Structured and legally mandated management system		
1.1.	EP "Process" states, "*Management agencies are physically and legally established at international, State and local levels.*" There is no mention in the rationale of where the agencies are located, i.e., physically established. With respect to EP "Evidence Basis", rather than requiring the reader to look for examples of evidence in the hyperlinked references, could the Team actually cite some examples, and/or provide a description of what the hyperlinks take the reader to? This comment is applicable for many of the clauses throughout the report and should be corrected. Also, it would help the reader if the references were written in the conventional way along with the hyperlink. In many instances, only the hyperlink is included, and these provide limited or no description of what they relate to. I would have expected to see the Groundfish FMPs included in the references as they appear to be key documents particularly for sablefish.	The team's interpretation of physicality is not related to an agency's geographical location but rather to its governance systems within its physical structures. More information related to the hyperlinks were used in this version of the report. References were written in a conventional way with the hyperlink. Groundfish FMP were included in the references.
1.2.	EP "Effectiveness" refers the reader back to the section above, but the section does not cover the demographic independence of the halibut stock. The halibut section does not mention the stock distribution or clarify why the halibut stock is considered or managed as a single stock in the Alaska EEZ. The references refer to the 5th surveillance reports, rather than research/information on stock distribution, migration, other biological characteristics of the stocks. So, the evidence does not support the requirements of the sub-clause.	The background information that appears in the report was sourced from the latest published information that the team considers sufficient for the purpose of the supporting clause Information was provided on the 5th surveillance. Thus the team is referring to this document rather than repeat the same text again
1.2.1.	The text related to EP "Process" refers the reader to the 5th surveillance audit reports. It would be helpful to have a hyperlink to take the reader to the reports and/or have them included in the references. The rationale for the "Evidence basis" is just a repeat of the requirement. There needs to be substantive evidence which, presumably is confirmed by the references.	A link to the 5th surveillance audit was included in this version of the report. The team respectively maintains that the information represents substantive

Clause	Peer Reviewer Comments	Assessment Team Response
	The table formatting appears to be awry in the numerical score row.	evidence sufficient to evaluate this component. Table formatting was fixed
1.3.	This clause relates to transboundary, shared, straddling, highly migratory or high seas stocks. These definitions usually relate to stocks that span or move between neighbouring coastal states EEZs. There is no mention or rationale in either this or clause 1.2 as to whether or how the Pacific halibut or sablefish stocks fit any of these descriptions. Given this clause is scored, the Assessment Team has concluded the stock meets some of these definitions, presumably the transboundary shared definition. With respect to Pacific halibut, from the information provided in the report, the stock is managed at the state, federal and international level (US and Canada). However, the focus in these sections seems to be primarily at the federal and state level. With respect to sablefish, the rationale only refers to Alaskan waters so this suggests it is not a transboundary stock, if so, it should not be scored against any of the transboundary related clauses. It appears that the Assessment Team have chosen to opt to score this and associated clauses 1.3.1, 1.4, 1.4.1, 1.5 as the stocks cross federal (US) and state (Alaska) jurisdictions, whereas, in my opinion, these clauses require the international management aspects to be considered.	The characteristics of the stocks are noted in the background and FCs sections. Correct. Correct. The state's role in limited. It is transboundary and scored appropriately. The team has given this matter due consideration throughout the assessment process, and is satisfied that the interpretation assigned to these clauses is appropriate and relevant.
1.3.1.	In the absence of clarity on whether the stocks are transboundary, shared, straddling, highly migratory or high seas stocks then it is difficult to know if the rationale is appropriate. With respect to Pacific halibut there is no mention of the IPHC or Canada which, given its international context, seems like an obvious place where overarching, common objectives would be established for a transboundary, shared stock. As written, this section only refers to the common objectives for the management unit in Alaskan waters, which further brings into question whether this is being considered as a transboundary, shared, straddling, highly migratory or high seas stock. Under EP "Current Status/Appropriateness/Effectiveness" "Sablefish", there's only mention of the state management of the fishery.	Please refer to comment above. The information is linked to the nature and score of both fisheries. While Canada is and remains an important bilateral partner within the IPHC, its domestic management systems are not particularly relevant as a contributor to the assessment of the fisheries in US waters.

Clause	Peer Reviewer Comments	Assessment Team Response
		The report recognizes both federal and state jurisdictional responsibilities.
1.4.	This clause is stated as "not relevant" which is counter-intuitive as clause 1.3 and sub clause 1.3.1, 1.4.1 and 1.5 are scored presumably owing to the stocks being transboundary, shared? If both Pacific halibut and sablefish are transboundary, shared stocks then I would have expected text to describe the on-going cooperation in stock assessment and data sharing between the US and Canada.	The conclusion is consistent with previous assessment/audit reports of the fisheries. This is described (albeit sparingly) in the mandates of the IPHC and its member organizations.
1.4.1	Given the Pacific halibut stock appears to be a transboundary, shared stock I would have expected text to describe how the US and Canada work together either within the auspicious of the IPHC or elsewhere to meet the respective EPs.	The information is consistent with the nature, scope and longstanding practices within the management authorities themselves.
1.5.	Given the stocks appear to be transboundary, shared stocks I would have expected text to describe how the US and Canada work together either within the auspicious of the IPHC or elsewhere to meet the respective EPs.	See above.
1.6.	There is no evidence in the evidence section, just a broad statement.	Statement is sufficient for scoring purpose.
1.6.1.	Not relevant.	No comments.
1.7.	The final bullet point in the "Evidence" section related to EP "Process", is referring to Pacific cod and Guideline Harvest Levels (GHL). The relationship this has to sablefish is not clear. The evidence under EP "Current status/Appropriateness/Effectiveness" does not provide examples to show that if management measures are not achieving the specific management objectives they are designed to achieve, they are revised and updated as appropriate. With respect to EP "Evidence Basis" rather than requiring the reader to look for examples of evidence in the hyperlinked references, could the Team actually cite examples, e.g., data showing recent regulation or management plan revisions?	The information was drawn from published documents and/or responses from authorities. The report acknowledges that management plans/measures for both fisheries are adjusted as/when necessary to meet evolving scientific and policy advice and other imperatives. There are examples listed (albeit sparingly) that speak to recent historical adjustments to the plans' provisions.
1.8.	The office of Law Enforcement (OLE), US Coastguard (USCG) and Alaskan Wildlife Troopers (AWT) are mentioned for the first time. There is nothing about them or their role in the preamble. The IPHC is under the heading "Federal management decision-making". According the IPHC website, it is an international organization.	The roles are described in the main report. There is no requirement that they be included in the preamble. This was corrected in the report.
1.9.	Not relevant.	
2. Coastal area management frameworks		

Clause	Peer Reviewer Comments	Assessment Team Response
2.1.	Under EP "Process", there is mention of the National Coastal Zone Management Program, however, Alaska withdrew from the voluntary program in 2011. Therefore, it is not clear what relevance this now has.	Purely background.
2.1.1.	This clause is about cooperation with neighbouring states. In this instance, that would mean Canada. The text only refers to cooperation between state and federal agencies.	The focus is necessarily U.S state-to-state and State-Federal consistent with the scope and intensity of the fisheries.
2.1.2.	No comment.	No comments.
2.2.	No comment.	No comments.
2.3.	No comment.	No comments.
2.4.	No comment.	No comments.
2.5.	No comment.	No comments.
2.6.	No comment.	No comments.
2.7.	No comment.	No comments.
3. Management objectives and plan		
3.1.	The SSEI and NNEI subdistrict do not set out management objectives. The peer reviewer is aware that ADFG will be adopting a proposal (RC055) in June 2023 for a revised regulation setting out clear objectives for groundfish FMPs. https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2022-2023/state/rcs/RC055_Member_Jensen_Substitute_Language_Proposal_161.pdf Hannah Wilson at AFDF should be able to confirm.	The team is aware and pleased that it is proceeding; we will report on the outcome during a forthcoming audit after the revised regulation has been promulgated.
3.1.1.	No comment.	No comments.
3.1.2.	No comment.	No comments.
3.1.3.	No comment.	No comments.
3.2.	Nothing to review.	No comments.
3.2.1.	No comment.	No comments.
3.2.2.	No comment.	No comments.
3.2.3.	No comment.	No comments.
3.2.4.	No comment.	No comments.

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

Clause	Peer Reviewer Comments	Assessment Team Response
4. Fishery data		
4.1.	Some formatting issues highlighted.	No comments.
4.1.1.	No comment.	No comments.
4.1.2.	Based on the information presented in the report I agree that this clause is not relevant.	No comments.
4.2.	No comment.	No comments.

Clause	Peer Reviewer Comments	Assessment Team Response
4.2.1.	No comment.	No comments.
4.3.	No comment.	No comments.
4.4.	No comment.	No comments.
4.5.	There appears to be an incomplete sentence regarding sablefish under EP Current Status / Appropriateness/Effectiveness.	Noted, and thanks very much for providing this input on the formatting.
4.6.	With respect Pacific halibut, the text under EP "Process" describes ceremonial and subsistence fishing but does not provide evidence of traditional fisher knowledge being investigated. Table 17 has been cropped.	Noted, and thanks very much for this – the evaluation of subsistence fishing that we report is the information available to the team regarding traditional fishing knowledge. The work by Boas (1910) informs the regulations imposed on subsistence fisheries. Similarly, traditional knowledge informs, through treaty, subsistence takes in Washington, Alaska, and BC, Canada. The Northwest Indian Fisheries Commission (https://nwifc.org/, located in the US northwest Pacific) was created following the 1974 U.S. v. Washington ruling (Boldt Decision) that re-affirmed the tribes' treaty-reserved fishing rights and works to provide monitoring, employment, and engagement of traditional and subsistence fishing of their member involved in northwest Pacific marine and Salmon fisheries. It is though organizations like this that traditional knowledge ins incorporated into the fishery. Boas, F. 1910. Tsimshian Mythology. Bureau of American Ethnology, Annual Report 1909-1910, U.S. Government Printing Office, Washington, D.C., pp. 27-1037.
4.7.	No comment.	No comments.
4.8.	Based on the information presented in the report I agree that this clause is not relevant.	No comments.
4.9.	Based on the information presented in the report I agree that this clause is not relevant.	No comments.
4.10.	Based on the information presented in the report I agree that this clause is not relevant.	No comments.
4.11.	Based on the information presented in the report I agree that this clause is not relevant.	No comments.

Clause	Peer Reviewer Comments	Assessment Team Response
5. Stock assessment		
5.1.	Some formatting errors were identified. See attached report with track changes.	Noted, and thanks very much for providing this input on the formatting.
5.1.1.	Not relevant.	No comments.
5.1.2.	No comment.	No comments.
5.2.	No comment.	No comments.
5.3.	No comment.	No comments.
5.4.	The Pacific halibut stock assessment should be included in the references.	Noted.
5.5.	No comment.	No comments.
6. Biological reference points and harvest control rule		
6.1.	No comment.	No comments.
6.2.	No comment.	No comments.
6.3.	No comment.	No comments.
6.4.	EP "Process" subheading should read "Alaska Pacific Sablefish". Also, a description or reference back to previous clauses as to what, "managed under Tier 3 of NPFMC HCRs" means, should be included.	Noted, we will make the formatting change in future iterations of this assessment.
6.5.	No comment.	
7. Precautionary approach		
7.1.	EP "Process" – there is no evidence of an explicit commitment or evidence of an overarching approach to applying the PA, e.g management measures, regulations or laws that explicitly require the use of the PA within the international, federal or state management regimes. The NPFMC tier system establishes precautionary reference points. It is not clear within the text how the State management measures, regulations and laws for sablefish apply the precautionary approach. The same comment applies for Pacific halibut.	The regional management approaches for sablefish and Halibut in Alaskan waters are described in detail in this section and the evidence is provided. For sablefish we provided relevant guidance harvest levels, and these are science-based.
7.1.1.	No comment.	No comments.
7.1.2.	Not relevant.	No comments.
7.2.	Not relevant.	No comments.

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

Clause	Peer Reviewer Comments	Assessment Team Response
8. Management measures		
8.1.	References should be inserted in the reference section.	Noted.
8.1.1.	No comment.	No comments

Clause	Peer Reviewer Comments	Assessment Team Response
8.1.2.	No mention in EP "Process" to show that management organisations have adopted and implemented effective measures necessary to manage bycatch and reduced discards in the sablefish or halibut fisheries. EP "Current status / Appropriateness/Effectiveness" there is no mention of non-target species. Further information on this point is needed to justify the score awarded.	Noted.
8.2.	No comment.	No comments.
8.3.	No comment.	No comments.
8.4.	No comment.	No comments.
8.4.1.	No comment.	No comments.
8.5.	No comment.	No comments.
8.5.1.	No comment.	No comments.
8.6.	No comment.	No comments.
8.7.	No comment.	No comments.
8.8.	Reference is made to Appendix 1 when it should be Appendix 5.	Agreed.
8.9.	Links to the websites of the principal federal and state fisheries management organisations showing the regulations that are in place for both halibut and sablefish fisheries should be provided otherwise evidence is not adequate to support the score.	Information is appropriate to score the SC.
8.10.	Based on the information presented in the report I agree that this clause is not relevant.	No comments.
8.11.	There is no mention of sablefish. Therefore, there is inadequate text to support a score of 10 for the sablefish UoA.	Noted.
8.12.	No comment.	No comments.
8.13.	Based on the information presented in the report I agree that this clause is not relevant.	No comments.
9. Appropriate standards of fishers' competence		
9.1.	No comment.	No comments.
9.2.	No comment.	No comments.
9.3.	The text indicates that information of fishers is published annually, however, the reference used is from 2015, (Fissel et al., 2015). Recommend a more recent reference is used. EP "Evidence Basis", the evidence provided are the references that should appear in the reference section.	A reference from Fissel *et al*. (2020) was used instead. References were added.
10. Effective legal and administrative framework		
10.1.	No comment.	No comment.
10.2.	No comment.	No comment.
10.3.	Based on the information presented in the report I agree that this clause is not relevant.	No comment.
10.3.1.	Based on the information presented in the report I agree that this clause is not relevant.	No comment.
10.4.	Based on the information presented in the report I agree that this clause is not relevant.	No comment.

Clause	Peer Reviewer Comments	Assessment Team Response
10.4.1.	Based on the information presented in the report I agree that this clause is not relevant.	No comment.
11. Framework for sanctions		
11.1.	No comment.	No comment.
11.2.	No comment.	No comment.
11.3.	Additional information/evidence could include examples of the regular reports by the OLE and USCG 17th Coast Guard District enforcement reports to NPFMC: USCG. 2022. Illegal, Unreported and Unregulated Fishing. https://www.uscg.mil/iuufishing/; NOAA. 2022. Enforcement Efforts to Combat illegal, Unreported and Unregulated Fishing. https://www.fisheries.noaa.gov/enforcement-efforts-combat-illegal-unreported-and-unregulated-fishing. OLE. 2021. Office of Law Enforcement Alaska Enforcement Division December Report to North Pacific Fisheries Management Council. October 2020 to September 2021. https://meetings.npfmc.org/CommentReview/DownloadFile?p=188b9834-6bd4-4281-b950-37581d7f6580.pdf&fileName=B4%202021%20December%20OLE%20Report.pdf.	Noted but information in report is sufficient to score the SC. Typically, the USCG violations are handed over to NOAA-OLE for follow-up.
11.4.	Based on the information presented in the report I agree that this clause is not relevant.	No comment.

11.1.2.3.4 Section D: Serious Impacts of the Fishery on the Ecosystem

Clause	Peer Reviewer Comments	Assessment Team Response
12. Impacts of the fishery on the ecosystem		
12.1.	No comment.	No comments.
12.2.	Based on the information presented in the report I agree that this clause is not relevant.	No comments.
12.2.1.	Under "EP Process", it says "Processes for the detection of possibly harmful effects to nontarget catch/associated species taken in BSAI and GOA groundfish fisheries have been established by the Council, NMFS, and NOAA". However, these are not described, or examples given. Reference is made to "linked species" under EP "Process". It is not clear what that means. It is possible it is referring to ETP species.	New text was added under Process. Term "linked" species was deleted and use of term non-target species was used.
12.2.2.	The references in the text are not included in full in the reference section.	References were included in this new version.
12.2.3.	No comment.	No comments.
12.2.4.	Under "EP Process", it says, "*There is a process that accounts for the most probable adverse impacts of the unit of certification on ETP species.*". While legislation is cited the processes or examples of processes are not described.	Examples of processes were included on this version.
12.2.5.	No comment.	No comments

Clause	Peer Reviewer Comments	Assessment Team Response
12.2.6.	Under "EP Process", it says, "*There is a process that accounts for the most probable adverse impacts of the unit of certification on habitats.*". The text does not refer to a process or substantiate why the fishery gear types do not cause risk to habitats. Rather, the process is set out in EP "Current status/Appropriateness/Effectiveness". An explanation as to why the "Response letter from AFDF April 7 2023" was needed would be helpful. Under EP "Evidence basis" There is no mention of GoA.	Text was added that included process under EP Process. An explanation was added to Response letter from AFDF April 7, 2023. GOA fisheries were added on the sentence.
12.2.7.	There is mention of "major research programs [that] aim to identify habitats that contribute to the survival, growth and productivity of sablefish…" however, they are not referenced. A list of HAPCs is provided. However, it is not clear if these have been designated for sablefish. There is a lot of unnecessary text in relation to management measures that have been developed to achieve the objectives of protecting halibut habitat. Reference is made to, "The Fishery Management Plan (FMP) for Groundfish Fisheries in the EEZ off Alaska". There are two groundfish FMPs, one for the BSAI and one or the GoA. Neither are referenced. No references are provided in the reference section.	On this revised report, the work by the MESA group on sablefish life history is mentioned. References to GOA, and BSAI FMP are mentioned on this revision. We disagree with the peer reviewer in removing text in relation to management measures that have been developed to achieve the objectives of protecting halibut habitat. The HAPC have been designed for groundfish not just only sablefish. Information was obtained from the hyperlinks.
12.2.8.	EP "Process" – no description of the mechanism, is provided, i.e., MSA requires Councils to identify EFH and give special attention to HAPCs.	Text added to include mechanisms on the EP Process.
12.2.9.	Only mention of BSAI under EP "Process".	There is no fishery ecosystem plan for the Gulf of Alaska.
12.2.10.	Some references are missing from the reference section and GoA is not referenced in the text, i.e., the full geographic extent of the UoAs.	References were added and GOA was referenced in the text.
12.2.11.	Some references are missing from the reference section and GoA is not referenced in the text, i.e., the full geographic extent of the UoAs.	References were added and GOA was referenced in the text.
12.3.	The cited references should appear in the "Reference" section, in full, with hyperlinks, where available. This should include GoA related references in order to give full geographic coverage of the UoAs.	References were added including GOA references.
12.4.	Recommend inclusion of GoA Ecosystem Status Report, and BSAI and GoA Groundfish FMPs in the cited references.	GOA ecosystem status report, BSAI and GOA FMP were added in the cited references.
12.5.	No references are included in the reference section.	Information was based on hyperlinks.

Clause	Peer Reviewer Comments	Assessment Team Response
12.6.	No references are included as evidence, and so the score of 10 cannot be substantiated.	References were included on the Evidence plus some hyperlinks.
12.7.	No Comment.	No comments.

11.1.2.4 Conclusion

Peer Reviewer Comments	Assessment Team Response
General Comments	
Please provide an overall conclusion including: ▪ An indication of whether or not you believe the conclusion of the Assessment Team is appropriate conclusion based on the evidence presented in the assessment report. *Subject to addressing the points raised above, the Assessment Team has set out a generally well justified report. Overall the decision to re-certify this fishery against the RFM standard is justified.* . Where non-conformances requiring corrective actions on behalf of the fishery have been raised, for each such non-conformance, please provide: ▪ An indication of whether or not you believe the non-conformances are appropriate. ▪ An indication of whether or not you believe the Corrective Action Plan is appropriate and likely to address the non-conformance within the specified timeframe. *No non-conformances were raised by the Assessment Team, however, EP 3.1 should be checked to see whether clear management objectives for the ADFG groundfish fisheries have now been adopted within regulation*	No comments.

11.2 Appendix 2 – Stakeholder submissions and Assessment Team Responses

There were no stakeholder submissions.

11.3 Appendix 3 – Data Deficient Framework (if applicable)

Both fisheries have comprehensive information. Thus, there is no need to use the Data Deficient Framework.

11.4 Appendix 4 – Assessment Team and Peer Reviewer Bios

11.4.1 Assessment Team Bios

Based on the technical expertise required to carry out this assessment, an Assessment Team was selected as follows.

Dr. Ivan Mateo, Lead Assessor

Dr. Ivan Mateo has over 25 years' experience working with natural resources population dynamic modelling. His specialization is in fish and crustacean population dynamics, stock assessment, evaluation of management strategies for exploited populations, bioenergetics, ecosystem-based assessment, and ecological statistical analysis. Dr. Mateo received a Ph.D. in Environmental Sciences with Fisheries specialization from the University of Rhode Island. He has studied population dynamics of economically important species as well as candidate species for endangered species listing from many different regions of the world such as the Caribbean, the Northeast US Coast, Gulf of California, and Alaska. He has done research with NMFS Northeast Fisheries Science Center Ecosystem Based Fishery Management on bio-energetic modelling for Atlantic cod He also has been working as environmental consultant in the Caribbean doing field work and looking at the effects of industrialization on essential fish habitats and for the Environmental Defense Fund developing population dynamics models for data poor stocks in the Gulf of California. Recently Dr. Mateo worked as National Research Council postdoc research associate at the NOAA National Marine Fisheries Services Ted Stevens Marine Research Institute on population dynamic modelling of Alaska sablefish.

Dr. Robert Leaf, Assessor 1

Dr. Robert Leaf has 20 years of experience working in the field of natural resource management of fin and shellfish. He specializes in the evaluation of management strategies of harvested species and the identification of environmental drivers that impact their population dynamics. Dr. Leaf received his master's degree in Marine Science at Moss Landing Marine Laboratories and his PhD in Fisheries and Wildlife Sciences from Virginia Polytechnic and State Institute. His last professional post was as a post-doc under Dr. Kevin Friedland at the Northeast Fishery Science Center's Narragansett Laboratory. There, he worked on understanding the impact of environmental conditions on fish stock productivity and recruitment. He has worked in the Gulf of Mexico for the last three years working on fish stock assessment of commercially and recreationally important species in that area. Dr. Leaf is a member of the Gulf of Mexico Fishery Management Council's Red Drum working group and NOAA's Marine Fisheries and Climate Taskforce. He currently supervises four masters level students working on various state and federally managed fish stocks.

Mr. Robert Allain, Assessor 2

Mr. Allain is a graduate of Saint Mary's University in Halifax, Nova Scotia with undergraduate degrees in Commerce (Business Administration) and Science (Chemistry). In 1977, he joined the then Federal Department of Fisheries and Environment as a Fishery Officer (International Surveillance) and carried out inspections of foreign and domestic fishing vessels within and beyond Canada's EEZ. During his 32-year career with the now Department of Fisheries and Oceans (DFO), Mr. Allain served in a variety of fisheries management, strategic planning and policy positions in Nova Scotia, New Brunswick, Prince Edward Island, Newfoundland, and Labrador, and at Departmental Headquarters in Ottawa. He served as a senior executive from 1991 to 2008.

Currently, Mr. Allain is the president of the consulting firm OceanIQ Management Services in Dieppe, New Brunswick. He is a Marine Stewardship Council-certified P3 assessor who has participated in approximately 25 assessments and surveillance audits in Canada and the U.S. in respect of demersal, pelagic, invertebrate, and crustacean fisheries. He is also fully conversant with the Alaska Responsible Fisheries Management (AK RFM) model through his participation as a technical expert to the ASMI's Fisheries Standard Committee that developed the certification scheme.

11.4.2 Peer Reviewer Bios

Based on the technical expertise required to carry out this assessment, a team of external Peer Reviewers was selected as follows.

Mr. Paul Knapman

Mr. 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 Program Manager, responsible for establishing and developing an extensive program 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 organization in England, with responsibility for managing an extensive area of inshore fisheries on the North Sea coast. The organizations 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 for MSC and RFM assessments/audits He returned to fisheries consultancy in 2015

Ms. Nancie Cummings

Ms. Nancie Cummings has over 35 years' experience working in marine and estuarine fisheries science in the US and Caribbean. She has been actively involved in conducting marine fish stock assessments, in the optimal design of fisheries data collections, and in providing inputs required for management of US federally managed species As a lead stock assessment analyst she has been involved for more than 30 years with analyses of highly migratory species (albacore and Bluefin tuna), coastal migratory species (king and Spanish mackerels, cobia, and dolphin fish), and reef fish stocks (amberjacks, groupers and shallow and deep-water snappers) in the US Gulf of Mexico and South Atlantic and Caribbean. Ms. Cummings has conducted primary fishery stock evaluations for status determinations required by US fishery management councils and has conducted stock rebuilding projections of US federally managed marine resources including reef fish, mackerels, tunas, and shellfish. Ms. Cummings also has experience conducting analyses of salmonid resources off Washington State, including in-season run-size forecasting, escapement estimations, and developing creel census estimations Ms. Cummings has extensive experience working with commercial and recreational fisheries constituent groups, tribal groups, national and international advisory groups, and academic institutions. Ms. Cummings has experience in application of data poor stock assessment techniques and experience developing and leading Data Limited Stock Assessment Workshops in the US and in an International forum. Ms. Cummings received her M.S. degree in Fisheries from the

College of Fisheries, University of Washington working on a stock assessment of Pacific Cod in the North Pacific Bering Sea. She holds a Bachelor of Science degree in Biology from Erskine College (South Carolina).

11.5 Appendix 5 - Response letter from AFDF regarding the NCs found.

Geraldine Criquet, Ph.D
Fisheries Team Leader
Global Trust Certification Ltd.
Quayside Business Park, Mill Street
Dundalk, County Louth, Ireland

April 7th, 2023

Dear Dr. Criquet,

On behalf of the Alaska Fisheries Development Foundation (AFDF), thank you for alerting us to two non-conformances in the Alaska halibut and sablefish fishery relative to the Responsible Fisheries Management (RFM) Standard Version 2.1. AFDF takes these non-conformances seriously and looks forward to working with the assessment team to resolve them.

Below, we provide information on Supporting Clauses 8.8 and 12.2.6 (erroneously listed as 12.26) that we believe resolve the non-conformances and thus negate the necessity of action plans. Supporting Clause 12.13 was also included in the letter, however, we determined that it was an error. If this is not true, please correct us.

Non-Conformance #1 (Supporting Clause 8.8)

The assessment team states that impacts of ghost fishing in the Pacific Halibut and Sablefish commercial fisheries, as well as pollution and waste related to lost or abandoned fishing gear, have not been adequately evaluated through peer-reviewed environmental assessments or studies. As a result, the assessment team determined that there is "insufficient information to conclude that operational measures are effective in minimizing, to the extent practical, pollution and waste," and more specifically, "that the availability and adequacy of evidence is insufficient to substantiate that measures are applied to minimize loss of fishing gear."

Below, we provide a summary of fishery regulations and voluntary measures in the halibut and sablefish commercial fisheries to minimize gear loss and prevent ghost fishing. We also summarize information on gear loss collected by the relevant management bodies for both Pacific halibut and sablefish. We have found, however, that while information regarding efforts to minimize gear loss is available from the relevant management bodies and the fishing industry, "peer-reviewed environmental assessments or studies" focusing on gear loss or ghost fishing are not available for these particular fisheries. AFDF also notes that the availability of peer-reviewed environmental assessments or studies is not listed as a requirement under RFM Standard Version 2.1 for determining that existing technologies, materials, and operational methods or measures used in the fishery are effective at minimizing gear loss, ghost fishing, pollution, and waste.

We hope the information provided below is sufficient to demonstrate that effective measures are in place to minimize gear loss, and to resolve the major non-conformance identified under Supporting Clause 8.8. We look forward to providing any further information needed to address the assessment team's concerns.

Regulatory Measures to Prevent Gear Loss

Harvesters in the commercial halibut and sablefish fishery have advocated for management measures and adopted voluntary efforts to minimize the loss of fishing gear. Addressing gear loss driven by open-access management was a key objective of the halibut and sablefish IFQ program adopted in 1996, which shifted halibut and sablefish management to a framework that relies on individual fishing quotas (IFQ) allocated to harvesters.[1] Gear loss rates in the Pacific halibut fishery are quantified annually across management areas through logbook data collected by the International Pacific Halibut Commission (IPHC). Gear loss rates in the Pacific halibut fishery declined significantly after the implementation of the IFQ program, which allowed the fishery to proceed more slowly and resulted in fewer instances of lost gear and associated halibut mortality. As the IPHC notes in its 2022 Annual Report, "The advent of quota-share fishery management in [British Columbia and Alaska] has greatly reduced the mortality from lost or abandoned gear."[2]

Since the implementation of IFQ, managers have continued to develop and implement measures to minimize gear loss in the halibut and sablefish fisheries. Amendment 101 to the Fishery Management Plan (FMP) for groundfish in the Gulf of Alaska (GOA), implemented in 2017, authorized the use of longline pot gear to harvest sablefish. In developing Amendment 101, the North Pacific Fishery Management Council's (NPFMC) preferred alternative included numerous provisions to prevent or minimize the potential for increased gear conflicts, including pot limits, pot tag and gear marking requirements, and gear tending requirements.[3] The NPFMC did not recommend authorizing the use of single pots due to concerns that this would result in higher rates of gear loss in the fishery relative to longline pot gear. Additionally, pot gear used in the sablefish fishery is required to have a biodegradable escape panel that will prevent lost pots from continuing to actively fish.

In addition to management measures approved through the NPFMC that require both pot longline gear and traditional longline gear to be clearly marked using visible buoys[4], harvesters have taken initiative to voluntarily deploy electronic automatic identification system (AIS) beacons on their fishing gear that allow gear to be tracked through onboard navigation software. U.S. policymakers are working to expand use of AIS beacons for this purpose: Section 11320 of the 2022 Coast Guard Authorization Act suspended federal enforcement of penalties against commercial harvesters using AIS beacons to track and retrieve gear until the Federal Communications Commission (FCC) can promulgate a final rule authorizing fishing equipment to be marked with such beacons.[5] As adoption of this technology becomes more widespread, AIS tracking of commercial fishing gear in Alaska's Pacific halibut and sablefish fisheries provides a promising new approach to continue minimizing gear loss in both the pot and longline fisheries.

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1 "Halibut Sablefish IFQ Program Review, December 2016" North Pacific Fishery Management Council.
2 IPHC (2023) International Pacific Halibut Commission Annual Report 2022. IPHC-2023-AR2022-R. 64 p.
3 "Environmental Assessment / Final Regulatory Impact Review for Amendment 101 to the Fishery Management Plan for Groundfish of the Gulf of Alaska, October 2016" North Pacific Fishery Management Council.
4 50 CFR § 679.24
5 James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 (P.L. 117-263)

Available Information on Gear Loss and Ghost Fishing

In order to fish effectively, longline gear requires the use of bait on the hooks. Typically, the bait is fish (herring, salmon, etc) that will soon deteriorate enough to fall off the hook and prevent the gear from fishing. The hooks are also believed to dissolve and become dull from the interaction with the bottom. Anecdotal reports from the Alaska Longline Fishermen's Association (ALFA) note that in most cases, longline gear only actively fishes for a couple days after loss, as bait falls off and gear tends to ball up. This anecdotal information from members of the longline fishery is supported by publicly available, peer-reviewed estimates of the risks of abandoned, lost and discarded fishing gear, which state that demersal longline gear presents lower risks than most other gear types.[6]

ALFA has also developd a bathymetric mapping program that allows for higher-resolution mapping of benthic habitats in commercial fishing areas. Fishermen utilize these maps to avoid sensitive and complex habitat areas where their gear may be at risk of loss or could cause harmful impacts to sensitive benthic and epibenthic habitat types like corals and sponges. Benthic mapping data collected from fishing vessels is made available back to fishermen so that they can incorporate these maps into their navigation software and utilize high-resolution benthic imagery as they deploy and retrieve gear.[7]

Some information regarding gear loss in the sablefish fishery can be gleaned from data collected by fishery observers, as well as Prior Notice of Landing (PNOL) reports submitted by vessel operators making sablefish landings. Observer data includes a performance code, where one code notes gear loss. This means that the set is flagged for having gear loss, but there is no record of the amount of gear loss. The quantity of gear lost (i.e., number of pots, skates, or hooks) is not recorded at-sea and so it is not in the observer database. As a result, data provided by NMFS shows percent of sets flagged for some gear loss, but does not reflect the total amount of gear lost in the fishery. For the sablefish pot fishery, PNOL reports submitted by vessel operators for their sablefish landings must include the number of pots fished and number of pots lost. In its January 2023 analysis of alternatives for amendments to the IFQ program, the NPFMC noted that 2,741 pots were reported lost out of 532,770 pots set in the GOA between 2017 and 2021, or 0.51%.[8]

We note that the assessment team, in their Evidence section, relied heavily on NOAA's ghost fishing narrative. In this narrative, NOAA recognizes longline gear as the least destructive of the various gears – this is also supported by publicly available, peer-reviewed information on the risks posed by loss of, and ghost fishing by, demersal longline gear relative to other commercial gear types.[9] The assessment team also mentions that derelict fishing gear (DFG) gear can harm underwater habitats but does not discuss the areas that the NPFMC has closed for protecting these habitats which we will discuss in our response for supporting clause 12.2.6.

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[6] Gilman, Eric, et al. "Highest risk abandoned, lost and discarded fishing gear." Scientific reports 11.1 (2021): 7195.
[7] More information on this program is available at https://www.alfafish.org/bathymetry.
[8] "Final Environmental Assessment / Regulatory Impact Review for Amendment 124 to the BSAI FMP for Groundfish and Amendment 112 to the GOA FMP for Groundfish to revise IFQ Program Regulations, January 2023" North Pacific Fishery Management Council.
[9] Gilman, et al. (2021)

Finally, we have attached a letter from the Alaska Department of Fish and Game (ADF&G), the agency that manages sablefish fisheries in state waters, stating that they do not believe that loss of longline gear or pots affects the populations of either the target or non-target species. This letter aligns with emailed comments from staff at NMFS, which state that gear loss in the halibut and sablefish IFQ fisheries is not a substantive conservation concern because NMFS has considered the potential impacts of lost gear in the IFQ fisheries in numerous recent (and historical) analyses (A. Miller, personal communication, March 30, 2023).

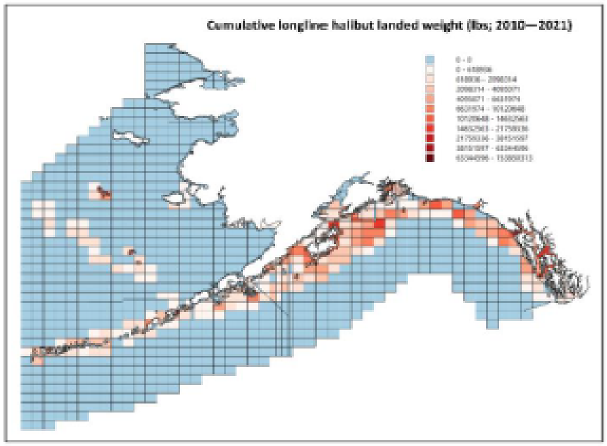
In summary, we believe that the information provided above demonstrates that there is sufficient evidence that measures are in place to minimize the loss of pot and longline gear in the halibut and sablefish fisheries, and that gear loss in these fisheries does not present a significant conservation concern for fishery managers. We believe that this is likely why there is a lack of peer-reviewed information concerning loss of gear for these fisheries. To conclude, we believe the attached comments from ADF&G and statement from NMFS regarding gear loss in the Pacific halibut and sablefish fisheries should allow the assessment team to conclude that it is not a non-conformance.

Non-Conformance #2 (Supporting Clause 12.2.6)

The assessment team determined that "there was not enough evidence to substantiate that the Alaska Pacific Halibut Unit of Certification fulfills Habitat Assessment Element 1 of Supporting 12.2.6." The assessment team was unable to substantiate the spatial footprint of the fishery relative to sensitive habitats, the range of sensitive habitats affected and unaffected by the fishery, and the percentage of overlap with known sensitive habitats rich in structural epifauna or biota in habitat areas of particular concern. As a result, the assessment team concluded that they information it received was "not sufficient to confirm that the effects of the Alaska Pacific Halibut fishery on sensitive habitats is reduced to a minimum percentage of the total area."

AFDF has prepared maps showing the spatial footprint of the halibut fishery across the Gulf of Alaska and into the Bering Sea and Aleutian Islands. Fishing intensity is quantified by cumulative landed weight from 2010—2021 and binned by ADF&G groundfish statistical areas. We compared fishing activity to sensitive habitat areas in maps provided by the National Marine Fisheries Service (NMFS) showing coral and sponge habitat[10] and Habitat Areas of Particular Concern (HAPCs) [11].

[10] NOAA Deep-Sea Coral and Sponge Map Portal https://www.ncei.noaa.gov/maps/deep-sea-corals/mapSites.htm
[11] NOAA Habitat Areas of Particular Concern North Pacific Annotated map.



The areas of greatest fishing activity for halibut in Alaska occur within Prince William Sound, around Kodiak Island, inside waters of Southeast Alaska, and outside of Unalaska in the Aleutian Islands. Prince William Sound contains relatively little coral and sponge habitat. Southeast Alaska does contain coral gardens, but these are predominantly in outside waters where less fishing activity occurs. At Cape Ommaney and the Fairweather grounds in Southeast, five HAPCs have been designated, banning all bottom contact gear in an area of 14 nm^2. HAPCs have also been designated around coral-rich seamounts in the Gulf of Alaska and Bower's Ridge in the Aleutian Islands, restricting a combined 10,639 nm^2 from all bottom-contact gear. In the Bering Sea, the Pribilof Habitat Conservation Area restricts an additional 7,000 nm^2 from hook and line gear[12].

Outside of these closed waters, overlap of the halibut longline fishery and coral habitat occurs in Beaver Inlet outside Unalaska, the North end of St. Matthew's Island, areas around Kodiak, and outside of Kachemak Bay. Collectively these areas make up 1,647 nm^2 of a total of the 177,155 nm^2 of statistical areas with halibut fishing activity, or 0.9%. Given this small fraction and the extensive habitat conservation areas where no fishing occurs, we believe that the benthic footprint of the Alaskan halibut fishery is minimal. With the bathymetric mapping discussed above, the Alaskan halibut longline fleet is proactively working to reduce its habitat impact beyond what is legally mandated.

In conclusion, we believe the above information should allow the assessment team to conclude that it is not a non-conformance.

We appreciate the opportunity to provide this additional information demonstrating the sustainability of Alaska's commercial fisheries targeting halibut and sablefish, and we look forward to your response.

[12] Western Pacific Regional Fishery Management Council. 2010 Marine Protected Areas.

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In conclusion, we believe the above information should allow the assessment team to conclude that it is not a non-conformance.

We appreciate the opportunity to provide this additional information demonstrating the sustainability of Alaska's commercial fisheries targeting halibut and sablefish, and we look forward to your response.

Sincerely,

Julie Decker

Julie Decker, Executive Director
Alaska Fisheries Development Foundation
P.O. Box 2223
Wrangell, AK 99929-2223

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Fish and Game

DIVISION OF COMMERCIAL FISHERIES
Headquarters Office

1255 West 8th Street
P.O. Box 115526
Juneau, Alaska 99811-5526
Main: 907.465.4210
Fax: 907.465.2604

March 24, 2023

Julie Decker
Executive Director
Alaska Fisheries Development Foundation
P. O. Box 2223
Wrangell, Alaska 99929

Alaska Pacific Halibut and Sablefish Commercial Fisheries Reassessment

Ms. Decker,

I am submitting this letter to provide additional information related to Non-Conformance #1 of the Alaska Pacific Halibut and Sablefish Commercial Fisheries Reassessment. The Alaska Department of Fish and Game (department) manages commercial sablefish fisheries in state waters of Southeast Alaska, Prince William Sound, Cook Inlet, and the Aleutian Islands. The department does not track gear loss in all these fisheries but does ask fishery participants to record gear loss in a mandatory logbook issued for Prince William Sound, Cook Inlet, and the two Southeast Alaska fisheries. Reported longline gear loss rate in these fisheries is usually less than 1% annually and is relatively constant across years. Reported pot gear loss rate shows greater interannual variability but is usually less than 5% per year (Tables 1-3).

Because gear loss is minimal the department does not account for impacts of ghost fishing by lost gear during the annual stock assessment process. It is important to note that pot gear must be equipped with a biodegradable escape mechanism allowing captured organisms to escape and rendering lost pots eventually inactive. Lost longline gear becomes inactive relatively quickly once bait degrades from hooks.

Please feel free to contact me if you require additional information on this matter.

Forrest R. Bowers
Alaska Department of Fish and Game
Deputy Director, Division of Commercial Fisheries

Table 1. Southeast Alaska sablefish fishery lost gear summary, 2013-2022.

NSEI	Total Skates Set	Skates Lost	Total Pots Set	Total Pots Lost	% Lost LL Skates	% Lost Pots
2013	5,727	2	Not legal	Not legal	0.03%	NA
2014	4,607	1	Not legal	Not legal	0.02%	NA
2015	5,202	2	Not legal	Not legal	0.04%	NA
2016	3,809	0	Not legal	Not legal	0.00%	NA
2017	4,373	37	Not legal	Not legal	0.85%	NA
2018	4,296	17	Not legal	Not legal	0.40%	NA
2019	5,628	9	Not legal	Not legal	0.16%	NA
2020	7,245	32	Not legal	Not legal	0.44%	NA
2021	6,918	25	Not legal	Not legal	0.36%	NA
2022	5,815	15	5,540	6	0.26%	0.11%
SSEI						
2013	5,550	0	1,872	0	0.00%	0.00%
2014	5,840	0	1,638	0	0.00%	0.00%
2015	6,186	0	1,872	0	0.00%	0.00%
2016	6,245	0	1,274	0	0.00%	0.00%
2017	5,630	0	1,211	0	0.00%	0.00%
2018	3,527	0	2,496	0	0.00%	0.00%
2019	4,670	0	1,319	0	0.00%	0.00%
2020	3,723	0	4,011	0	0.00%	0.00%
2021	2,510	0	9,288	0	0.00%	0.00%
2022	839	0	18,445	11	0.00%	0.06%

Table 2. Prince William Sound sablefish fishery lost gear summary, 2013-2022.

PWSI	Total Skates Set	Skates Lost	Total Pots Set	Total Pots Lost	% Lost LL Skates	% Lost Pots
2013	3,285	2	43	2	0.06%	4.65%
2014	2,670	63	10	0	2.36%	0.00%
2015	1,328	0	73	0	0.00%	0.00%
2016	1,575	1	0	0	0.06%	0.00%
2017	1,210	9	0	0	0.74%	0.00%
2018	1,706	2	0	0	0.12%	0.00%
2019	777	0	30	2	0.00%	6.67%
2020	977	0	1349	46	0.00%	3.41%
2021	1,411	0	2442	1	0.00%	0.04%
2022	583	3	2476	1	0.51%	0.04%

Table 3. Cook Inlet sablefish fishery lost gear summary, 2013-2022.

CI	Total Skates Set	Skates Lost	Total Pots Set	Total Pots Lost	% Lost LL Skates	% Lost Pots
2013	1,433	0	0	0	0.00%	0.00%
2014	1,385	0	0	0	0.00%	0.00%
2015	1,539	0	0	0	0.00%	0.00%
2016	1,864	13	0	0	0.70%	0.00%
2017	1,373	0	0	0	0.00%	0.00%
2018	1,180	0	15	3	0.00%	20.00%
2019	538	0	0	0	0.00%	0.00%
2020	0	0	0	0	0.00%	0.00%
2021	319	0	0	0	0.00%	0.00%
2022	92	0	0	0	0.00%	0.00%

(t = net lb * 0.000453592)

Original mortality values in millions of pounds to three decimal places converted to the values below in tonnes

Effective skate = standardised unit (548.64 m skate with 100 hooks at 5.49 m spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	landed net wt (t), incl IPHC research	commercial discard mortality (t)
2021	2A	3,757.2	5.2	0.0014	343.75	0.48
2021	2B	18,834.3	115.4	0.0061	2,400.31	14.64
2021	2C	11,932.5	48.2	0.0040	1,568.64	6.27
2021	3A	30,611.7	67.1	0.0022	4,117.88	9.06
2021	3B	11,778.5	34.2	0.0029	1,122.53	3.26
2021	4A	10,645.7	59.8	0.0056	662.10	3.71
2021	4B	4,195.2	6.4	0.0015	352.61	0.53
2021	4C	1,198.2	11.3	0.0094	91.96	0.86
2021	4D	5,608.2	8.4	0.0015	520.41	0.78
2021	4E	13.5	0.0	0.0000	18.75	0.00
2020	2A	3,860.7	0.0	0.0000	360.80	0.00
2020	2B	23,953.0	62.5	0.0026	2,311.94	6.01
2020	2C	11,088.8	15.5	0.0014	1,549.37	2.17
2020	3A	24,074.3	30.1	0.0013	3,297.58	4.29
2020	3B	11,597.6	17.8	0.0015	1,039.84	1.56
2020	4A	9,614.8	51.3	0.0053	521.21	2.76
2020	4B	4,277.0	19.3	0.0045	407.88	1.84
2020	4C	795.3	0.0	0.0000	47.08	0.00
2020	4D	5,178.1	8.5	0.0016	640.39	1.02
2020	4E	218.9	0.0	0.0000	42.22	0.00
2019	2A	3,805.3	4.8	0.0013	380.67	0.49
2019	2B	25,737.6	38.6	0.0015	2,341.84	3.51
2019	2C	12,252.0	29.5	0.0024	1,670.21	4.01
2019	3A	22,995.8	29.0	0.0013	3,725.27	4.84
2019	3B	13,216.4	30.8	0.0023	1,046.48	2.41
2019	4A	11,982.6	91.7	0.0077	632.58	4.87
2019	4B	5,011.1	36.8	0.0073	462.17	3.37
2019	4C	5,868.9	9.7	0.0017	221.69	0.38
2019	4D	5,633.5	2.3	0.0004	475.87	0.19
2019	4E	13.2	0.0	0.0000	54.37	0.00
2018	2A	4,135.2	22.7	0.0055	308.99	1.70
2018	2B	16,756.2	54.1	0.0032	2,466.52	7.89
2018	2C	12,810.0	40.3	0.0031	1,646.80	5.11
2018	3A	26,208.1	58.9	0.0022	3,399.82	7.48
2018	3B	18,579.8	56.5	0.0030	1,134.30	3.40
2018	4A	9,296.9	46.8	0.0050	566.03	2.83
2018	4B	4,608.0	24.4	0.0053	484.02	2.57
2018	4C	4,245.1	16.1	0.0038	229.31	0.87
2018	4D	4,733.8	1.5	0.0003	380.81	0.11
2018	4E	351.0	0.0	0.0000	43.10	0.00
2017	2A	4,745.9	27.7	0.0058	336.03	1.95
2017	2B	34,507.5	38.3	0.0011	2,831.22	3.11

IPHC-2023-TSD-024

Time-series of directed commercial O32 discard mortality (tonnes, net weight) due to lost gear
PREPARED BY: IPHC SECRETARIAT (POSTED 20 JANUARY 2023)

(t = net lb * 0.000453592)

Original mortality values in millions of pounds to three decimal places converted to the values below in tonnes

Effective skate = standardised unit (548.64 m skate with 100 hooks at 5.49 m spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	landed net wt (t), incl IPHC research	commercial discard mortality (t)
2017	2C	15,047.9	40.4	0.0027	1,915.40	5.17
2017	3A	22,714.8	28.9	0.0013	3,555.61	4.62
2017	3B	16,902.0	24.7	0.0015	1,407.44	2.11
2017	4A	8,467.5	30.2	0.0036	584.92	2.11
2017	4B	4,522.4	6.8	0.0015	497.34	0.75
2017	4C	4,858.2	7.3	0.0015	242.44	0.36
2017	4D	3,486.5	0.9	0.0003	428.74	0.13
2016	2A	3,361.0	14.2	0.0042	295.91	1.24
2016	2B	19,215.6	78.1	0.0041	2,782.90	11.41
2016	2C	15,328.0	24.2	0.0016	1,813.53	2.90
2016	3A	23,589.1	27.3	0.0012	3,435.27	4.12
2016	3B	14,223.6	3.8	0.0003	1,233.00	0.37
2016	4A	6,870.8	24.9	0.0036	625.45	2.25
2016	4B	4,753.0	8.5	0.0018	504.26	0.91
2016	4C	5,864.2	3.5	0.0006	185.55	0.11
2016	4D	5,708.9	32.1	0.0056	432.74	2.42
2016	4E	572.5	25.8	0.0451	54.36	2.45
2015	2A	2,469.0	15.8	0.0064	259.39	1.66
2015	2B	17,779.1	57.0	0.0032	2,716.80	8.69
2015	2C	14,543.5	31.2	0.0021	1,710.32	3.59
2015	3A	24,165.4	46.3	0.0019	3,613.73	6.87
2015	3B	15,454.7	11.7	0.0008	1,223.65	0.98
2015	4A	7,367.0	43.7	0.0059	622.37	3.67
2015	4B	5,134.3	6.4	0.0012	504.01	0.60
2015	4C	4,235.6	7.7	0.0018	187.33	0.34
2015	4D	3,725.5	17.5	0.0047	310.50	1.46
2015	4E	303.1	0.0	0.0000	43.39	0.00
2014	2A	2,669.2	17.8	0.0067	240.69	1.61
2014	2B	19,234.7	62.7	0.0033	2,668.16	8.80
2014	2C	13,984.8	24.5	0.0018	1,552.27	2.79
2014	3A	27,166.5	43.9	0.0016	3,474.78	5.56
2014	3B	22,104.3	18.9	0.0009	1,322.71	1.19
2014	4A	4,971.2	21.9	0.0044	411.10	1.81
2014	4B	5,988.9	47.4	0.0079	507.52	4.01
2014	4C	4,768.1	0.2	0.0000	180.08	0.00
2014	4D	3,313.0	9.3	0.0028	321.75	0.90
2013	2A	3,285.7	17.6	0.0054	245.69	1.33
2013	2B	21,540.8	51.3	0.0024	2,741.15	6.58
2013	2C	12,061.2	104.4	0.0087	1,375.90	11.97
2013	3A	37,370.0	110.3	0.0030	5,024.61	15.07
2013	3B	26,120.9	30.7	0.0012	1,855.54	2.23
2013	4A	7,114.7	75.6	0.0106	559.09	5.93

Time-series of directed commercial O32 discard mortality (tonnes, net weight) due to lost gear

PREPARED BY: IPHC SECRETARIAT (POSTED 20 JANUARY 2023)

(t = net lb * 0.000453592)

Original mortality values in millions of pounds to three decimal places converted to the values below in tonnes

Effective skate = standardised unit (548.64 m skate with 100 hooks at 5.49 m spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	landed net wt (t), incl IPHC research	commercial discard mortality (t)
2013	4B	7,192.0	25.6	0.0036	568.41	2.05
2013	4C	7,214.0	25.6	0.0035	232.37	0.81
2013	4D	5,167.2	6.0	0.0012	443.97	0.53
2013	4E	0.0	0.0	0.0000	126.90	0.00
2012	2A	4,048.6	34.6	0.0085	260.12	2.21
2012	2B	22,474.3	69.6	0.0031	2,713.86	8.41
2012	2C	9,850.1	49.5	0.0050	1,222.05	6.11
2012	3A	35,055.7	66.1	0.0019	5,457.38	10.37
2012	3B	31,078.0	64.5	0.0021	2,288.32	4.81
2012	4A	6,951.6	23.4	0.0034	717.90	2.44
2012	4B	7,703.3	35.2	0.0046	788.45	3.63
2012	4C	8,775.1	8.2	0.0009	255.26	0.23
2012	4D	7,246.5	15.5	0.0021	649.17	1.36
2012	4E	272.0	0.0	0.0000	157.48	0.00
2011	2A	3,733.3	27.2	0.0073	245.52	1.79
2011	2B	26,755.2	140.3	0.0052	3,035.33	15.78
2011	2C	11,147.4	21.1	0.0019	1,113.13	2.11
2011	3A	38,276.8	97.1	0.0025	6,653.87	16.63
2011	3B	39,694.8	48.3	0.0012	3,320.67	3.98
2011	4A	9,384.9	109.7	0.0117	1,066.14	12.47
2011	4B	7,099.9	71.2	0.0100	931.61	9.32
2011	4C	10,308.3	29.5	0.0029	358.53	1.04
2011	4D	9,243.9	26.9	0.0029	989.86	2.87
2010	2A	1,545.0	5.0	0.0032	189.93	0.61
2010	2B	31,138.0	137.0	0.0044	3,052.01	13.43
2010	2C	21,594.0	50.0	0.0023	2,034.73	4.68
2010	3A	55,097.0	97.0	0.0018	9,299.79	16.74
2010	3B	48,157.0	95.0	0.0020	4,587.50	9.18
2010	4A	8,589.5	44.0	0.0051	1,054.48	5.38
2010	4B	7,792.0	59.0	0.0076	829.73	6.31
2010	4C	9,486.0	8.0	0.0008	358.06	0.29
2010	4D	6,705.0	33.0	0.0049	959.60	4.70
2010	4E	4.0	0.0	0.0000	186.03	0.00
2009	2A	2,575.3	16.0	0.0062	222.23	1.38
2009	2B	38,305.0	129.0	0.0034	3,010.47	10.24
2009	2C	23,797.0	62.0	0.0026	2,247.35	5.84
2009	3A	54,262.8	134.0	0.0025	9,867.89	24.67
2009	3B	40,122.6	72.0	0.0018	4,889.33	8.80
2009	4A	7,996.0	43.0	0.0054	1,146.63	6.19
2009	4B	5,486.0	118.0	0.0215	722.65	15.54
2009	4C	6,158.0	21.0	0.0034	292.33	0.99
2009	4D	6,138.0	29.0	0.0047	1,002.61	4.71

Time-series of directed commercial O32 discard mortality (tonnes, net weight) due to lost gear
IPHC-2023-TSD-024 PREPARED BY: IPHC SECRETARIAT (POSTED 20 JANUARY 2023)

(t = net lb * 0.000453592)

Original mortality values in millions of pounds to three decimal places converted to the values below in tonnes

Effective skate = standardised unit (548.64 m skate with 100 hooks at 5.49 m spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	landed net wt (t), incl IPHC research	commercial discard mortality (t)
2009	4E	38.0	0.0	0.0000	206.56	0.00
2008	2A	4,550.0	2.0	0.0004	309.48	0.12
2008	2B	49,149.4	198.0	0.0040	3,517.59	14.07
2008	2C	29,314.0	75.0	0.0026	2,815.14	7.32
2008	3A	51,510.0	160.0	0.0031	11,122.67	34.48
2008	3B	34,572.0	13.0	0.0004	4,875.05	1.95
2008	4A	10,603.0	53.0	0.0050	1,367.77	6.84
2008	4B	5,973.0	82.0	0.0137	799.66	10.96
2008	4C	7,353.0	15.0	0.0020	328.27	0.66
2008	4D	6,503.0	24.0	0.0037	1,157.52	4.28
2008	4E	35.0	0.0	0.0000	271.97	0.00
2007	2A	3,631.0	16.0	0.0044	357.72	1.57
2007	2B	54,983.0	270.0	0.0049	4,432.50	21.72
2007	2C	38,262.0	120.0	0.0031	3,843.34	11.91
2007	3A	52,569.0	172.0	0.0033	12,016.98	39.66
2007	3B	26,277.0	63.0	0.0024	4,195.25	10.07
2007	4A	10,193.0	70.0	0.0069	1,282.94	8.85
2007	4B	4,017.0	34.0	0.0085	642.34	5.46
2007	4C	7,158.0	5.0	0.0007	249.88	0.17
2007	4D	6,420.0	4.0	0.0006	1,233.78	0.74
2007	4E	124.0	0.0	0.0000	262.37	0.00
2006	2A	2,080.0	4.0	0.0019	376.29	0.71
2006	2B	66,765.0	301.0	0.0045	5,445.25	24.50
2006	2C	46,144.0	126.0	0.0027	4,759.27	12.85
2006	3A	47,116.0	96.0	0.0020	11,663.71	23.33
2006	3B	27,901.0	43.0	0.0015	4,894.91	7.34
2006	4A	10,049.0	63.0	0.0063	1,511.51	9.52
2006	4B	2,430.0	11.0	0.0045	721.38	3.25
2006	4C	5,785.0	16.0	0.0028	223.56	0.63
2006	4D	3,803.0	1.0	0.0003	1,074.09	0.32
2006	4E	153.0	0.0	0.0000	165.87	0.00
2005	2A	2,870.0	24.0	0.0084	364.35	3.06
2005	2B	74,301.0	256.0	0.0034	5,593.45	19.02
2005	2C	40,681.0	180.0	0.0044	4,819.46	21.21
2005	3A	46,834.0	173.0	0.0037	11,808.43	43.69
2005	3B	33,174.0	81.0	0.0024	5,974.24	14.34
2005	4A	10,096.0	97.0	0.0096	1,543.94	14.82
2005	4B	5,742.0	39.0	0.0068	895.79	6.09
2005	4C	6,172.0	19.0	0.0031	242.00	0.75
2005	4D	4,746.0	0.0	0.0000	1,169.30	0.00
2004	2A	2,414.0	0.0	0.0000	400.98	0.00
2004	2B	72,856.0	326.0	0.0045	5,516.72	24.83

4 of 16

IPHC-2023-TSD-024

Time-series of directed commercial O32 discard mortality (tonnes, net weight) due to lost gear

PREPARED BY: IPHC SECRETARIAT (POSTED 20 JANUARY 2023)

(t = net lb * 0.000453592)

Original mortality values in millions of pounds to three decimal places converted to the values below in tonnes

Effective skate = standardised unit (548.64 m skate with 100 hooks at 5.49 m spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	landed net wt (t), incl IPHC research	commercial discard mortality (t)
2004	2C	31,636.0	97.0	0.0031	4,642.21	14.39
2004	3A	41,267.0	153.0	0.0037	11,415.53	42.24
2004	3B	34,103.0	52.0	0.0015	7,012.54	10.52
2004	4A	9,320.0	120.0	0.0129	1,615.38	20.84
2004	4B	9,927.0	68.0	0.0069	1,233.35	8.51
2004	4C	6,840.0	27.0	0.0039	432.84	1.69
2004	4D	2,615.0	8.0	0.0031	750.73	2.33
2004	4E	10.0	0.0	0.0000	142.39	0.00
2003	2A	2,175.0	6.0	0.0028	371.33	1.04
2003	2B	65,672.0	242.0	0.0037	5,347.32	19.79
2003	2C	26,286.0	91.0	0.0035	3,815.60	13.35
2003	3A	37,873.0	227.0	0.0060	10,321.22	61.93
2003	3B	37,588.0	104.0	0.0028	7,812.40	21.87
2003	4A	14,335.0	145.0	0.0101	2,278.68	23.01
2003	4B	13,606.0	66.0	0.0049	1,752.20	8.59
2003	4C	6,943.0	20.0	0.0029	401.94	1.17
2003	4D	3,399.0	2.0	0.0006	887.19	0.53
2003	4E	20.0	0.0	0.0000	188.09	0.00
2002	2A	2,658.0	16.0	0.0060	386.06	2.32
2002	2B	64,871.0	187.0	0.0029	5,476.41	15.88
2002	2C	25,597.0	113.0	0.0044	3,901.81	17.17
2002	3A	37,032.0	279.0	0.0075	10,492.25	78.69
2002	3B	34,186.0	108.0	0.0032	7,853.05	25.13
2002	4A	13,017.0	116.0	0.0089	2,309.19	20.55
2002	4B	12,881.0	132.0	0.0102	1,850.60	18.88
2002	4C	8,960.0	31.0	0.0035	549.02	1.92
2002	4D	2,855.0	2.0	0.0007	794.93	0.56
2002	4E	24.0	0.0	0.0000	251.96	0.00
2001	2A	2,509.0	12.0	0.0048	308.59	1.48
2001	2B	50,519.0	176.0	0.0035	4,666.38	16.33
2001	2C	32,704.0	154.0	0.0047	3,811.56	17.91
2001	3A	35,797.0	143.0	0.0040	9,769.85	39.08
2001	3B	28,022.0	75.0	0.0027	7,409.94	20.01
2001	4A	10,816.0	127.0	0.0117	2,274.57	26.61
2001	4B	11,122.0	105.0	0.0094	2,026.86	19.05
2001	4C	7,094.0	34.0	0.0048	747.21	3.59
2001	4D	1,985.0	12.0	0.0060	836.26	5.02
2001	4E	36.0	0.0	0.0000	217.13	0.00
2000	2A	643.0	9.0	0.0140	218.89	3.06
2000	2B	57,894.0	214.0	0.0037	4,903.85	18.14
2000	2C	32,618.0	213.0	0.0065	3,830.46	24.90
2000	3A	33,884.0	215.0	0.0063	8,742.00	55.07

Time-series of directed commercial O32 discard mortality (tonnes, net weight) due to lost gear

PREPARED BY: IPHC SECRETARIAT (POSTED 20 JANUARY 2023)

(t = net lb * 0.000453592)

Original mortality values in millions of pounds to three decimal places converted to the values below in tonnes

Effective skate = standardised unit (548.64 m skate with 100 hooks at 5.49 m spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	landed net wt (t), incl IPHC research	commercial discard mortality (t)
2000	3B	20,286.0	104.0	0.0051	6,991.16	35.65
2000	4A	8,494.0	39.0	0.0046	2,338.15	10.76
2000	4B	10,697.0	120.0	0.0112	2,128.12	23.83
2000	4C	6,929.0	26.0	0.0038	787.48	2.99
2000	4D	2,057.0	0.0	0.0000	875.84	0.00
1999	2A	1,114.0	22.0	0.0197	204.09	4.02
1999	2B	72,818.0	295.0	0.0041	5,762.80	23.63
1999	2C	33,412.0	325.0	0.0097	4,600.62	44.63
1999	3A	44,768.0	263.0	0.0059	11,483.33	67.75
1999	3B	18,561.0	113.0	0.0061	6,275.39	38.28
1999	4A	6,556.0	81.0	0.0124	1,981.67	24.57
1999	4B	10,162.0	112.0	0.0110	1,619.89	17.82
1999	4C	5,323.0	46.0	0.0086	798.20	6.86
1999	4D	1,653.0	11.0	0.0067	858.74	5.75
1999	4E	92.0	0.0	0.0000	119.69	0.00
1998	2A	1,733.0	5.0	0.0029	208.68	0.61
1998	2B	70,809.0	340.0	0.0048	5,974.82	28.68
1998	2C	25,127.0	154.0	0.0061	4,624.97	28.21
1998	3A	42,320.0	357.0	0.0084	11,656.25	97.91
1998	3B	13,569.0	82.0	0.0060	5,062.60	30.38
1998	4A	5,098.0	47.0	0.0092	1,550.08	14.26
1998	4B	6,870.0	40.0	0.0058	1,315.99	7.63
1998	4C	1,854.0	9.0	0.0049	569.57	2.79
1998	4D	1,180.0	15.0	0.0127	593.48	7.54
1997	2A	1,154.0	16.0	0.0139	187.30	2.60
1997	2B	62,965.0	243.0	0.0039	5,635.03	21.98
1997	2C	26,944.0	185.0	0.0069	4,497.96	31.04
1997	3A	41,389.0	233.0	0.0056	11,175.07	62.58
1997	3B	11,932.0	104.0	0.0087	4,110.61	35.76
1997	4A	4,999.0	66.0	0.0132	1,318.83	17.41
1997	4B	7,309.0	87.0	0.0119	1,505.03	17.91
1997	4C	1,804.0	14.0	0.0078	506.85	3.95
1997	4D	1,209.0	1.0	0.0008	522.74	0.42
1996	2A	1,472.0	28.0	0.0190	134.06	2.55
1996	2B	50,862.0	188.0	0.0037	4,330.08	16.02
1996	2C	23,737.0	188.0	0.0079	4,023.64	31.79
1996	3A	32,984.0	324.0	0.0098	8,932.66	87.54
1996	3B	4,742.0	26.0	0.0055	1,661.33	9.14
1996	4A	2,314.0	58.0	0.0251	770.88	19.35
1996	4B	2,688.0	41.0	0.0153	938.27	14.36
1996	4C	383.0	5.0	0.0131	308.45	4.04
1996	4D	408.0	0.0	0.0000	320.39	0.00

(t = net lb * 0.000453592)

Original mortality values in millions of pounds to three decimal places converted to the values below in tonnes

Effective skate = standardised unit (548.64 m skate with 100 hooks at 5.49 m spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	landed net wt (t), incl IPHC research	commercial discard mortality (t)
1995	2A	2,009.0	25.0	0.0124	134.84	1.67
1995	2B	51,200.0	274.0	0.0054	4,365.05	23.57
1995	2C	17,479.0	123.0	0.0070	3,522.43	24.66
1995	3A	31,574.0	293.0	0.0093	8,317.10	77.35
1995	3B	3,843.0	10.0	0.0026	1,417.31	3.69
1995	4A	2,033.0	48.0	0.0236	733.46	17.31
1995	4B	3,688.0	37.0	0.0100	762.17	7.62
1995	4C	495.0	0.0	0.0000	302.83	0.00
1995	4D	578.0	0.0	0.0000	291.59	0.00
1994	2A	3,330.0	8.0	0.0024	167.75	0.40
1994	2B	53,335.0	363.0	0.0068	4,495.48	30.57
1994	2C	23,702.0	433.0	0.0183	4,707.62	86.15
1994	3A	41,769.0	1,435.0	0.0344	11,268.96	387.65
1994	3B	6,201.0	81.0	0.0131	1,750.97	22.94
1994	4A	2,969.0	90.0	0.0303	818.04	24.79
1994	4B	4,996.0	91.0	0.0182	914.94	16.65
1994	4C	2,418.0	10.0	0.0041	324.26	1.33
1994	4D	811.0	31.0	0.0382	322.46	12.32
1993	2A	2,355.0	32.0	0.0136	228.77	3.11
1993	2B	57,072.0	537.0	0.0094	4,820.49	45.31
1993	2C	25,976.0	386.0	0.0149	5,120.83	76.30
1993	3A	42,572.0	598.0	0.0140	10,313.55	144.39
1993	3B	11,564.0	102.0	0.0088	3,563.13	31.36
1993	4A	5,105.0	113.0	0.0221	1,161.53	25.67
1993	4B	5,478.0	92.0	0.0168	890.11	14.95
1993	4C	1,948.0	12.0	0.0062	376.94	2.34
1993	4D	650.0	14.0	0.0215	379.28	8.15
1992	2A	2,269.0	53.0	0.0234	197.25	4.62
1992	2B	51,913.0	450.0	0.0087	3,458.94	30.09
1992	2C	23,667.0	497.0	0.0210	4,453.91	93.53
1992	3A	53,814.0	1,276.0	0.0237	12,148.04	287.91
1992	3B	13,628.0	304.0	0.0223	3,911.00	87.22
1992	4A	4,085.0	91.0	0.0223	1,224.26	27.30
1992	4B	5,275.0	104.0	0.0197	1,051.14	20.71
1992	4C	1,777.0	31.0	0.0174	359.66	6.26
1992	4D	1,130.0	28.0	0.0248	329.95	8.18
1992	4E	267.0	0.0	0.0000	32.54	0.00
1991	2A	1,385.0	34.0	0.0245	160.80	3.94
1991	2B	55,814.0	649.0	0.0116	3,261.76	37.84
1991	2C	19,227.0	903.0	0.0470	3,940.32	185.20
1991	3A	53,349.0	2,385.0	0.0447	10,399.25	464.85
1991	3B	20,652.0	687.0	0.0333	5,413.31	180.26

Time-series of directed commercial O32 discard mortality (tonnes, net weight) due to lost gear

IPHC-2023-TSD-024

PREPARED BY: IPHC SECRETARIAT (POSTED 20 JANUARY 2023)

(t = net lb * 0.000453592)

Original mortality values in millions of pounds to three decimal places converted to the values below in tonnes

Effective skate = standardised unit (548.64 m skate with 100 hooks at 5.49 m spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	landed net wt (t), incl IPHC research	commercial discard mortality (t)
1991	4A	3,488.0	197.0	0.0565	1,022.85	57.79
1991	4B	1,807.0	94.0	0.0520	686.48	35.70
1991	4C	1,677.0	21.0	0.0125	307.58	3.84
1991	4D	1,849.0	48.0	0.0260	651.60	16.94
1991	4E	176.0	0.0	0.0000	47.31	0.00

Effective skate = standardised unit (1,800 ft skate with 100 hooks at 18 ft spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	Commercial landed net wt (lb), incl IPHC research	Directed commercial discard mortality (Mlb)
2021	2A	3,757.2	5.2	0.0014	757,838	0.001
2021	2B	18,834.3	115.4	0.0061	5,291,773	0.032
2021	2C	11,932.5	48.2	0.0040	3,458,266	0.014
2021	3A	30,611.7	67.1	0.0022	9,078,388	0.02
2021	3B	11,778.5	34.2	0.0029	2,474,762	0.007
2021	4A	10,645.7	59.8	0.0056	1,459,676	0.008
2021	4B	4,195.2	6.4	0.0015	777,376	0.001
2021	4C	1,198.2	11.3	0.0094	202,742	0.002
2021	4D	5,608.2	8.4	0.0015	1,147,309	0.002
2021	4E	13.5	0.0	0.0000	41,335	0
2020	2A	3,860.7	0.0	0.0000	795,418	0
2020	2B	23,953.0	62.5	0.0026	5,096,970	0.013
2020	2C	11,088.8	15.5	0.0014	3,415,788	0.005
2020	3A	24,074.3	30.1	0.0013	7,269,919	0.009
2020	3B	11,597.6	17.8	0.0015	2,292,462	0.003
2020	4A	9,614.8	51.3	0.0053	1,149,081	0.006
2020	4B	4,277.0	19.3	0.0045	899,232	0.004
2020	4C	795.3	0.0	0.0000	103,803	0
2020	4D	5,178.1	8.5	0.0016	1,411,823	0.002
2020	4E	218.9	0.0	0.0000	93,085	0
2019	2A	3,805.3	4.8	0.0013	839,233	0.001
2019	2B	25,737.6	38.6	0.0015	5,162,883	0.008
2019	2C	12,252.0	29.5	0.0024	3,682,188	0.009
2019	3A	22,995.8	29.0	0.0013	8,212,826	0.011
2019	3B	13,216.4	30.8	0.0023	2,307,089	0.005
2019	4A	11,982.6	91.7	0.0077	1,394,597	0.011
2019	4B	5,011.1	36.8	0.0073	1,018,908	0.007
2019	4C	5,868.9	9.7	0.0017	488,744	0.001
2019	4D	5,633.5	2.3	0.0004	1,049,110	0
2019	4E	13.2	0.0	0.0000	119,862	0
2018	2A	4,135.2	22.7	0.0055	681,205	0.004
2018	2B	16,756.2	54.1	0.0032	5,437,744	0.017
2018	2C	12,810.0	40.3	0.0031	3,630,579	0.011
2018	3A	26,208.1	58.9	0.0022	7,495,321	0.016
2018	3B	18,579.8	56.5	0.0030	2,500,709	0.008
2018	4A	9,296.9	46.8	0.0050	1,247,890	0.006
2018	4B	4,608.0	24.4	0.0053	1,067,086	0.006
2018	4C	4,245.1	16.1	0.0038	505,532	0.002
2018	4D	4,733.8	1.5	0.0003	839,534	0
2018	4E	351.0	0.0	0.0000	95,017	0
2017	2A	4,745.9	27.7	0.0058	740,818	0.004
2017	2B	34,507.5	38.3	0.0011	6,241,777	0.007

Effective skate = standardised unit (1,800 ft skate with 100 hooks at 18 ft spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	Commercial landed net wt (lb), incl IPHC research	Directed commercial discard mortality (Mlb)
2017	2C	15,047.9	40.4	0.0027	4,222,741	0.011
2017	3A	22,714.8	28.9	0.0013	7,838,786	0.01
2017	3B	16,902.0	24.7	0.0015	3,102,870	0.005
2017	4A	8,467.5	30.2	0.0036	1,289,522	0.005
2017	4B	4,522.4	6.8	0.0015	1,096,442	0.002
2017	4C	4,858.2	7.3	0.0015	534,479	0.001
2017	4D	3,486.5	0.9	0.0003	945,214	0
2016	2A	3,361.0	14.2	0.0042	652,379	0.003
2016	2B	19,215.6	78.1	0.0041	6,135,249	0.025
2016	2C	15,328.0	24.2	0.0016	3,998,151	0.006
2016	3A	23,589.1	27.3	0.0012	7,573,486	0.009
2016	3B	14,223.6	3.8	0.0003	2,718,302	0.001
2016	4A	6,870.8	24.9	0.0036	1,378,877	0.005
2016	4B	4,753.0	8.5	0.0018	1,111,714	0.002
2016	4C	5,864.2	3.5	0.0006	409,078	0
2016	4D	5,708.9	32.1	0.0056	954,025	0.005
2016	4E	572.5	25.8	0.0451	119,849	0.005
2015	2A	2,469.0	15.8	0.0064	571,868	0.004
2015	2B	17,779.1	57.0	0.0032	5,989,530	0.019
2015	2C	14,543.5	31.2	0.0021	3,770,610	0.008
2015	3A	24,165.4	46.3	0.0019	7,966,909	0.015
2015	3B	15,454.7	11.7	0.0008	2,697,682	0.002
2015	4A	7,367.0	43.7	0.0059	1,372,092	0.008
2015	4B	5,134.3	6.4	0.0012	1,111,163	0.001
2015	4C	4,235.6	7.7	0.0018	412,984	0.001
2015	4D	3,725.5	17.5	0.0047	684,525	0.003
2015	4E	303.1	0.0	0.0000	95,660	0
2014	2A	2,669.2	17.8	0.0067	530,632	0.004
2014	2B	19,234.7	62.7	0.0033	5,882,280	0.019
2014	2C	13,984.8	24.5	0.0018	3,422,179	0.006
2014	3A	27,166.5	43.9	0.0016	7,660,589	0.012
2014	3B	22,104.3	18.9	0.0009	2,916,083	0.003
2014	4A	4,971.2	21.9	0.0044	906,318	0.004
2014	4B	5,988.9	47.4	0.0079	1,118,895	0.009
2014	4C	4,768.1	0.2	0.0000	397,017	0
2014	4D	3,313.0	9.3	0.0028	709,339	0.002
2013	2A	3,285.7	17.6	0.0054	541,648	0.003
2013	2B	21,540.8	51.3	0.0024	6,043,209	0.015
2013	2C	12,061.2	104.4	0.0087	3,033,343	0.026
2013	3A	37,370.0	110.3	0.0030	11,077,374	0.033
2013	3B	26,120.9	30.7	0.0012	4,090,778	0.005
2013	4A	7,114.7	75.6	0.0106	1,232,583	0.013

Effective skate = standardised unit (1,800 ft skate with 100 hooks at 18 ft spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	Commercial landed net wt (lb), incl IPHC research	Directed commercial discard mortality (Mlb)
2013	4B	7,192.0	25.6	0.0036	1,253,134	0.005
2013	4C	7,214.0	25.6	0.0035	512,281	0.002
2013	4D	5,167.2	6.0	0.0012	978,793	0.001
2013	4E	0.0	0.0	0.0000	279,769	0
2012	2A	4,048.6	34.6	0.0085	573,456	0.005
2012	2B	22,474.3	69.6	0.0031	5,983,051	0.019
2012	2C	9,850.1	49.5	0.0050	2,694,160	0.013
2012	3A	35,055.7	66.1	0.0019	12,031,483	0.023
2012	3B	31,078.0	64.5	0.0021	5,044,884	0.011
2012	4A	6,951.6	23.4	0.0034	1,582,697	0.005
2012	4B	7,703.3	35.2	0.0046	1,738,232	0.008
2012	4C	8,775.1	8.2	0.0009	562,763	0.001
2012	4D	7,246.5	15.5	0.0021	1,431,182	0.003
2012	4E	272.0	0.0	0.0000	347,192	0
2011	2A	3,733.3	27.2	0.0073	541,289	0.004
2011	2B	26,755.2	140.3	0.0052	6,691,770	0.035
2011	2C	11,147.4	21.1	0.0019	2,454,033	0.005
2011	3A	38,276.8	97.1	0.0025	14,669,279	0.037
2011	3B	39,694.8	48.3	0.0012	7,320,827	0.009
2011	4A	9,384.9	109.7	0.0117	2,350,429	0.028
2011	4B	7,099.9	71.2	0.0100	2,053,840	0.021
2011	4C	10,308.3	29.5	0.0029	790,426	0.002
2011	4D	9,243.9	26.9	0.0029	2,182,280	0.006
2010	2A	1,545.0	5.0	0.0032	418,719	0.001
2010	2B	31,138.0	137.0	0.0044	6,728,539	0.03
2010	2C	21,594.0	50.0	0.0023	4,485,822	0.01
2010	3A	55,097.0	97.0	0.0018	20,502,543	0.037
2010	3B	48,157.0	95.0	0.0020	10,113,724	0.02
2010	4A	8,589.5	44.0	0.0051	2,324,725	0.012
2010	4B	7,792.0	59.0	0.0076	1,829,249	0.014
2010	4C	9,486.0	8.0	0.0008	789,394	0.001
2010	4D	6,705.0	33.0	0.0049	2,115,556	0.01
2010	4E	4.0	0.0	0.0000	410,123	0
2009	2A	2,575.3	16.0	0.0062	489,932	0.003
2009	2B	38,305.0	129.0	0.0034	6,636,962	0.023
2009	2C	23,797.0	62.0	0.0026	4,954,560	0.013
2009	3A	54,262.8	134.0	0.0025	21,754,990	0.054
2009	3B	40,122.6	72.0	0.0018	10,779,145	0.019
2009	4A	7,996.0	43.0	0.0054	2,527,883	0.014
2009	4B	5,486.0	118.0	0.0215	1,593,181	0.034
2009	4C	6,158.0	21.0	0.0034	644,469	0.002
2009	4D	6,138.0	29.0	0.0047	2,210,383	0.01

Effective skate = standardised unit (1,800 ft skate with 100 hooks at 18 ft spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	Commercial landed net wt (lb), incl IPHC research	Directed commercial discard mortality (Mlb)
2009	4E	38.0	0.0	0.0000	455,380	0
2008	2A	4,550.0	2.0	0.0004	682,277	0
2008	2B	49,149.4	198.0	0.0040	7,754,960	0.031
2008	2C	29,314.0	75.0	0.0026	6,206,332	0.016
2008	3A	51,510.0	160.0	0.0031	24,521,312	0.076
2008	3B	34,572.0	13.0	0.0004	10,747,652	0.004
2008	4A	10,603.0	53.0	0.0050	3,015,426	0.015
2008	4B	5,973.0	82.0	0.0137	1,762,950	0.024
2008	4C	7,353.0	15.0	0.0020	723,707	0.001
2008	4D	6,503.0	24.0	0.0037	2,551,898	0.009
2008	4E	35.0	0.0	0.0000	599,596	0
2007	2A	3,631.0	16.0	0.0044	788,636	0.003
2007	2B	54,983.0	270.0	0.0049	9,772,004	0.048
2007	2C	38,262.0	120.0	0.0031	8,473,113	0.026
2007	3A	52,569.0	172.0	0.0033	26,492,931	0.087
2007	3B	26,277.0	63.0	0.0024	9,248,956	0.022
2007	4A	10,193.0	70.0	0.0069	2,828,402	0.02
2007	4B	4,017.0	34.0	0.0085	1,416,121	0.012
2007	4C	7,158.0	5.0	0.0007	550,884	0
2007	4D	6,420.0	4.0	0.0006	2,720,028	0.002
2007	4E	124.0	0.0	0.0000	578,425	0
2006	2A	2,080.0	4.0	0.0019	829,578	0.002
2006	2B	66,765.0	301.0	0.0045	12,004,728	0.054
2006	2C	46,144.0	126.0	0.0027	10,492,400	0.028
2006	3A	47,116.0	96.0	0.0020	25,714,105	0.051
2006	3B	27,901.0	43.0	0.0015	10,791,439	0.016
2006	4A	10,049.0	63.0	0.0063	3,332,313	0.021
2006	4B	2,430.0	11.0	0.0045	1,590,367	0.007
2006	4C	5,785.0	16.0	0.0028	492,874	0.001
2006	4D	3,803.0	1.0	0.0003	2,367,966	0.001
2006	4E	153.0	0.0	0.0000	365,692	0
2005	2A	2,870.0	24.0	0.0084	803,253	0.007
2005	2B	74,301.0	256.0	0.0034	12,331,452	0.042
2005	2C	40,681.0	180.0	0.0044	10,625,098	0.047
2005	3A	46,834.0	173.0	0.0037	26,033,147	0.096
2005	3B	33,174.0	81.0	0.0024	13,170,957	0.032
2005	4A	10,096.0	97.0	0.0096	3,403,798	0.033
2005	4B	5,742.0	39.0	0.0068	1,974,870	0.013
2005	4C	6,172.0	19.0	0.0031	533,530	0.002
2005	4D	4,746.0	0.0	0.0000	2,577,874	0
2004	2A	2,414.0	0.0	0.0000	884,010	0
2004	2B	72,856.0	326.0	0.0045	12,162,297	0.055

Effective skate = standardised unit (1,800 ft skate with 100 hooks at 18 ft spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	Commercial landed net wt (lb), incl IPHC research	Directed commercial discard mortality (Mlb)
2004	2C	31,636.0	97.0	0.0031	10,234,319	0.032
2004	3A	41,267.0	153.0	0.0037	25,166,962	0.093
2004	3B	34,103.0	52.0	0.0015	15,460,009	0.023
2004	4A	9,320.0	120.0	0.0129	3,561,298	0.046
2004	4B	9,927.0	68.0	0.0069	2,719,072	0.019
2004	4C	6,840.0	27.0	0.0039	954,256	0.004
2004	4D	2,615.0	8.0	0.0031	1,655,073	0.005
2004	4E	10.0	0.0	0.0000	313,911	0
2003	2A	2,175.0	6.0	0.0028	818,638	0.002
2003	2B	65,672.0	242.0	0.0037	11,788,829	0.044
2003	2C	26,286.0	91.0	0.0035	8,411,961	0.029
2003	3A	37,873.0	227.0	0.0060	22,754,421	0.137
2003	3B	37,588.0	104.0	0.0028	17,223,398	0.048
2003	4A	14,335.0	145.0	0.0101	5,023,643	0.051
2003	4B	13,606.0	66.0	0.0049	3,862,941	0.019
2003	4C	6,943.0	20.0	0.0029	886,136	0.003
2003	4D	3,399.0	2.0	0.0006	1,955,919	0.001
2003	4E	20.0	0.0	0.0000	414,660	0
2002	2A	2,658.0	16.0	0.0060	851,120	0.005
2002	2B	64,871.0	187.0	0.0029	12,073,423	0.035
2002	2C	25,597.0	113.0	0.0044	8,602,034	0.038
2002	3A	37,032.0	279.0	0.0075	23,131,461	0.173
2002	3B	34,186.0	108.0	0.0032	17,313,026	0.055
2002	4A	13,017.0	116.0	0.0089	5,090,894	0.045
2002	4B	12,881.0	132.0	0.0102	4,079,884	0.042
2002	4C	8,960.0	31.0	0.0035	1,210,391	0.004
2002	4D	2,855.0	2.0	0.0007	1,752,533	0.001
2002	4E	24.0	0.0	0.0000	555,481	0
2001	2A	2,509.0	12.0	0.0048	680,322	0.003
2001	2B	50,519.0	176.0	0.0035	10,287,622	0.036
2001	2C	32,704.0	154.0	0.0047	8,403,052	0.039
2001	3A	35,797.0	143.0	0.0040	21,538,851	0.086
2001	3B	28,022.0	75.0	0.0027	16,336,127	0.044
2001	4A	10,816.0	127.0	0.0117	5,014,581	0.059
2001	4B	11,122.0	105.0	0.0094	4,468,475	0.042
2001	4C	7,094.0	34.0	0.0048	1,647,326	0.008
2001	4D	1,985.0	12.0	0.0060	1,843,635	0.011
2001	4E	36.0	0.0	0.0000	478,682	0
2000	2A	643.0	9.0	0.0140	482,576	0.007
2000	2B	57,894.0	214.0	0.0037	10,811,150	0.04
2000	2C	32,618.0	213.0	0.0065	8,444,720	0.055
2000	3A	33,884.0	215.0	0.0063	19,272,825	0.121

Effective skate = standardised unit (1,800 ft skate with 100 hooks at 18 ft spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	Commercial landed net wt (lb), incl IPHC research	Directed commercial discard mortality (Mlb)
2000	3B	20,286.0	104.0	0.0051	15,412,893	0.079
2000	4A	8,494.0	39.0	0.0046	5,154,735	0.024
2000	4B	10,697.0	120.0	0.0112	4,691,710	0.053
2000	4C	6,929.0	26.0	0.0038	1,736,087	0.007
2000	4D	2,057.0	0.0	0.0000	1,930,907	0
1999	2A	1,114.0	22.0	0.0197	449,936	0.009
1999	2B	72,818.0	295.0	0.0041	12,704,807	0.052
1999	2C	33,412.0	325.0	0.0097	10,142,649	0.098
1999	3A	44,768.0	263.0	0.0059	25,316,422	0.149
1999	3B	18,561.0	113.0	0.0061	13,834,874	0.084
1999	4A	6,556.0	81.0	0.0124	4,368,841	0.054
1999	4B	10,162.0	112.0	0.0110	3,571,257	0.039
1999	4C	5,323.0	46.0	0.0086	1,759,728	0.015
1999	4D	1,653.0	11.0	0.0067	1,893,200	0.013
1999	4E	92.0	0.0	0.0000	263,868	0
1998	2A	1,733.0	5.0	0.0029	460,064	0.001
1998	2B	70,809.0	340.0	0.0048	13,172,239	0.063
1998	2C	25,127.0	154.0	0.0061	10,196,312	0.062
1998	3A	42,320.0	357.0	0.0084	25,697,664	0.216
1998	3B	13,569.0	82.0	0.0060	11,161,132	0.067
1998	4A	5,098.0	47.0	0.0092	3,417,344	0.031
1998	4B	6,870.0	40.0	0.0058	2,901,259	0.017
1998	4C	1,854.0	9.0	0.0049	1,255,688	0.006
1998	4D	1,180.0	15.0	0.0127	1,308,404	0.017
1997	2A	1,154.0	16.0	0.0139	412,925	0.006
1997	2B	62,965.0	243.0	0.0039	12,423,122	0.048
1997	2C	26,944.0	185.0	0.0069	9,916,304	0.068
1997	3A	41,389.0	233.0	0.0056	24,636,823	0.138
1997	3B	11,932.0	104.0	0.0087	9,062,353	0.079
1997	4A	4,999.0	66.0	0.0132	2,907,532	0.038
1997	4B	7,309.0	87.0	0.0119	3,318,032	0.039
1997	4C	1,804.0	14.0	0.0078	1,117,419	0.009
1997	4D	1,209.0	1.0	0.0008	1,152,440	0.001
1996	2A	1,472.0	28.0	0.0190	295,554	0.006
1996	2B	50,862.0	188.0	0.0037	9,546,203	0.035
1996	2C	23,737.0	188.0	0.0079	8,870,618	0.07
1996	3A	32,984.0	324.0	0.0098	19,693,163	0.193
1996	3B	4,742.0	26.0	0.0055	3,662,598	0.02
1996	4A	2,314.0	58.0	0.0251	1,699,500	0.043
1996	4B	2,688.0	41.0	0.0153	2,068,522	0.032
1996	4C	383.0	5.0	0.0131	680,007	0.009
1996	4D	408.0	0.0	0.0000	706,332	0

Effective skate = standardised unit (1,800 ft skate with 100 hooks at 18 ft spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	Commercial landed net wt (lb), incl IPHC research	Directed commercial discard mortality (Mlb)
1995	2A	2,009.0	25.0	0.0124	297,273	0.004
1995	2B	51,200.0	274.0	0.0054	9,623,303	0.052
1995	2C	17,479.0	123.0	0.0070	7,765,636	0.054
1995	3A	31,574.0	293.0	0.0093	18,336,081	0.171
1995	3B	3,843.0	10.0	0.0026	3,124,632	0.008
1995	4A	2,033.0	48.0	0.0236	1,617,002	0.038
1995	4B	3,688.0	37.0	0.0100	1,680,293	0.017
1995	4C	495.0	0.0	0.0000	667,636	0
1995	4D	578.0	0.0	0.0000	642,857	0
1994	2A	3,330.0	8.0	0.0024	369,817	0.001
1994	2B	53,335.0	363.0	0.0068	9,910,844	0.067
1994	2C	23,702.0	433.0	0.0183	10,378,542	0.19
1994	3A	41,769.0	1,435.0	0.0344	24,843,824	0.855
1994	3B	6,201.0	81.0	0.0131	3,860,240	0.051
1994	4A	2,969.0	90.0	0.0303	1,803,462	0.055
1994	4B	4,996.0	91.0	0.0182	2,017,108	0.037
1994	4C	2,418.0	10.0	0.0041	714,882	0.003
1994	4D	811.0	31.0	0.0382	710,901	0.027
1993	2A	2,355.0	32.0	0.0136	504,343	0.007
1993	2B	57,072.0	537.0	0.0094	10,627,363	0.1
1993	2C	25,976.0	386.0	0.0149	11,289,516	0.168
1993	3A	42,572.0	598.0	0.0140	22,737,512	0.318
1993	3B	11,564.0	102.0	0.0088	7,855,357	0.069
1993	4A	5,105.0	113.0	0.0221	2,560,741	0.057
1993	4B	5,478.0	92.0	0.0168	1,962,364	0.033
1993	4C	1,948.0	12.0	0.0062	831,018	0.005
1993	4D	650.0	14.0	0.0215	836,160	0.018
1992	2A	2,269.0	53.0	0.0234	434,860	0.01
1992	2B	51,913.0	450.0	0.0087	7,625,673	0.066
1992	2C	23,667.0	497.0	0.0210	9,819,188	0.206
1992	3A	53,814.0	1,276.0	0.0237	26,781,876	0.635
1992	3B	13,628.0	304.0	0.0223	8,622,283	0.192
1992	4A	4,085.0	91.0	0.0223	2,699,027	0.06
1992	4B	5,275.0	104.0	0.0197	2,317,361	0.046
1992	4C	1,777.0	31.0	0.0174	792,925	0.014
1992	4D	1,130.0	28.0	0.0248	727,423	0.018
1992	4E	267.0	0.0	0.0000	71,735	0
1991	2A	1,385.0	34.0	0.0245	354,510	0.009
1991	2B	55,814.0	649.0	0.0116	7,190,950	0.083
1991	2C	19,227.0	903.0	0.0470	8,686,934	0.408
1991	3A	53,349.0	2,385.0	0.0447	22,926,430	1.025
1991	3B	20,652.0	687.0	0.0333	11,934,312	0.397

IPHC-2023-TSD-024

Time-series of directed commercial O32 discard mortality (millions of pounds, net weight) due to lost gear
PREPARED BY: IPHC SECRETARIAT (POSTED 20 JANUARY 2023)

Effective skate = standardised unit (1,800 ft skate with 100 hooks at 18 ft spacing)

Year	IPHC Regulatory Area	Effective Skates Hauled	Effective Skates Lost	Lost ratio (lost/hauled)	Commercial landed net wt (lb), incl IPHC research	Directed commercial discard mortality (Mlb)
1991	4A	3,488.0	197.0	0.0565	2,254,990	0.127
1991	4B	1,807.0	94.0	0.0520	1,513,422	0.079
1991	4C	1,677.0	21.0	0.0125	678,093	0.008
1991	4D	1,849.0	48.0	0.0260	1,436,533	0.037
1991	4E	176.0	0.0	0.0000	104,297	0

IFQ = Y
Target = Sablefish
Loss = sets with an unknown quantity of gear loss

	By year and NPFMC area	LL sets with gear loss/total longline sets	Pot sets with gear loss/total longline sets	(LL sets with gear loss + pot sets with gear loss)/total sets
	Year	% lost LL	% lost pots	% lost all
AI	2006	2%	15%	6%
	2007	3%	0%	2%
	2008	2%	0%	2%
	2009	1%	20%	5%
	2010	3%	27%	4%
	2011	2%	6%	3%
	2012	2%	13%	4%
	2013	1%		1%
	2014	4%		4%
	2015	1%	0%	1%
	2016	1%	0%	1%
	2017	0%	10%	9%
	2018	0%	4%	3%
	2019	0%	0%	0%
	2020	0%	12%	11%
	2021	0%	4%	3%
	2022	0%	8%	8%
AI Total		2%	7%	3%
BS	2006	5%	6%	6%
	2007	0%	13%	11%
	2008	0%	5%	4%
	2009	0%	7%	7%
	2010	0%	1%	1%
	2011	0%	4%	4%
	2012		12%	12%
	2013	4%	3%	3%
	2014	0%	2%	1%
	2015	0%	17%	13%
	2016	0%	2%	2%
	2017	0%	2%	1%
	2018	0%	2%	1%
	2019	0%	2%	2%
	2020	0%	3%	3%
	2021	0%	2%	2%
	2022	0%	2%	2%
BS Total		1%	5%	5%
CG	2006	1%		1%
	2007	1%		1%
	2008	1%		1%

	2009	2%		2%
	2010	1%		1%
	2011	0%		0%
	2012	1%		1%
	2013	1%		1%
	2014	1%		1%
	2015	1%		1%
	2016	2%		2%
	2017	2%	0%	2%
	2018	1%	1%	1%
	2019	0%	1%	0%
	2020	2%	5%	4%
	2021	3%	4%	4%
	2022	3%	3%	3%
CG Total		1%	3%	2%
EY	2006	0%		0%
	2007	3%		3%
	2008	2%		2%
	2009	0%		0%
	2010	1%		1%
	2011	5%		5%
	2012	3%		3%
	2013	1%		1%
	2014	3%		3%
	2015	1%		1%
	2016	3%		3%
	2017	2%	2%	2%
	2018	0%	0%	0%
	2019	2%	2%	2%
	2020	1%	5%	2%
	2021	1%	4%	2%
	2022	3%	3%	3%
EY Total		2%	3%	2%
WG	2006	0%		0%
	2007	0%		0%
	2008	0%		0%
	2009	0%		0%
	2010	1%		1%
	2011	2%		2%
	2012	4%		4%
	2013	1%		1%
	2014	1%		1%
	2015	3%		3%
	2016	1%		1%
	2017	0%	0%	0%
	2018	0%	11%	3%
	2019	1%	0%	1%
	2020	0%	6%	5%

	2021	0%	3%	3%
	2022	0%	5%	4%
WG Total		1%	5%	2%
WY	2006	2%		2%
	2007	0%		0%
	2008	2%		2%
	2009	1%		1%
	2010	1%		1%
	2011	0%		0%
	2012	0%		0%
	2013	0%		0%
	2014	2%		2%
	2015	1%		1%
	2016	1%		1%
	2017	0%	0%	0%
	2018	1%	3%	1%
	2019	0%	0%	0%
	2020	0%	0%	0%
	2021	0%	3%	3%
	2022	0%	3%	3%
WY Total		1%	3%	1%
Grand Total		1%	5%	2%

All Areas

Year	% lost LL	% lost pots	% lost all
2006	1%	8%	3%
2007	1%	8%	2%
2008	1%	4%	2%
2009	1%	10%	3%
2010	2%	3%	2%
2011	1%	5%	3%
2012	2%	12%	4%
2013	1%	3%	1%
2014	2%	2%	2%
2015	1%	10%	1%
2016	2%	1%	2%
2017	2%	3%	2%
2018	1%	3%	1%
2019	1%	1%	1%
2020	1%	5%	4%
2021	1%	4%	3%
2022	2%	4%	3%
Grand Total	1%	5%	2%

FMP Areas

FMP	Year	% lost LL	% lost pots	% lost all
BSAI	2006	3%	8%	6%
	2007	2%	8%	5%
	2008	2%	4%	3%
	2009	1%	10%	6%
	2010	3%	3%	3%
	2011	2%	5%	4%
	2012	2%	12%	7%
	2013	1%	3%	1%
	2014	4%	2%	3%
	2015	1%	10%	2%
	2016	1%	1%	1%
	2017	0%	5%	4%
	2018	0%	2%	2%

	2019	0%	2%	1%
	2020	0%	6%	6%
	2021	0%	4%	3%
	2022	0%	4%	4%
BSAI Total		2%	6%	4%
GOA	2006	1%		1%
	2007	1%		1%
	2008	1%		1%
	2009	1%		1%
	2010	1%		1%
	2011	1%		1%
	2012	1%		1%
	2013	1%		1%
	2014	2%		2%
	2015	1%		1%
	2016	2%		2%
	2017	2%	1%	1%
	2018	1%	3%	1%
	2019	1%	1%	1%
	2020	1%	5%	3%
	2021	1%	4%	3%
	2022	2%	3%	3%
GOA Total		1%	3%	2%
Grand Total		1%	5%	2%

Notes

Observer data has a performance code, where one code is gear loss. This means that the set is flagge
there is no record of the amount of gear loss. The quantity of gear lost (i.e., # of pots or skates or ho
and so it is not in the observer database.

Here I have summarized the % of sets with some gear loss by gear type and in some cases by area.

These are sets where the AKRO determined that they were targeting sablefish (based on the weight
other potential targets) and there was available IFQ on the fishing trip.

Note - pot gear in GOA was legalized in 2017.

Data source, AKFIN.org

cara.rodgveller@noaa.gov