

ENVIRONMENTAL ASSESSMENT AND REGULATORY IMPACT REVIEW
FOR
2018 PACIFIC HALIBUT CATCH LIMITS IN INTERNATIONAL PACIFIC HALIBUT
COMMISSION REGULATORY AREA 2A (WASHINGTON, OREGON, AND
CALIFORNIA)

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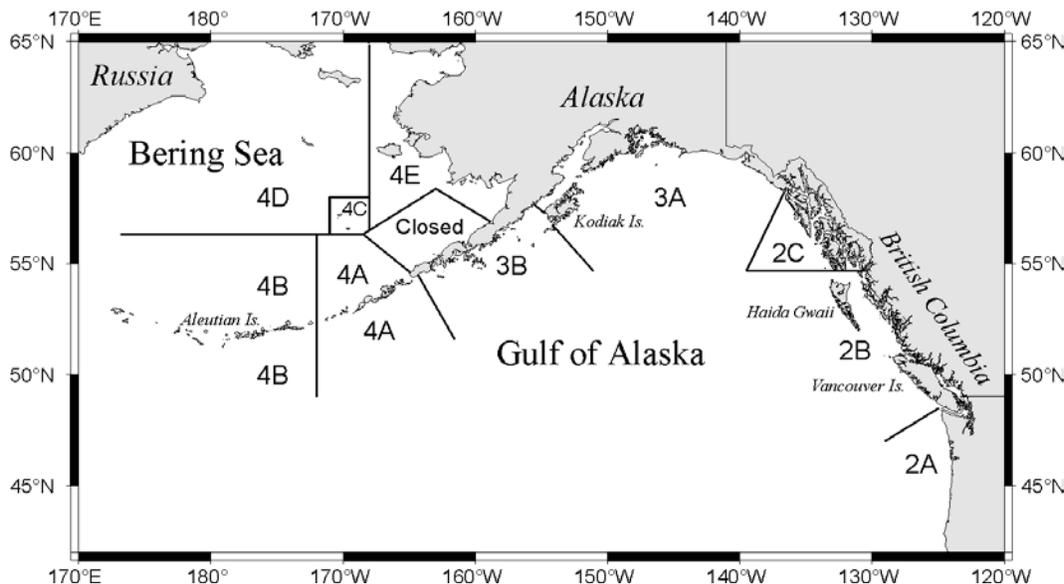
1.0 INTRODUCTION

1.1 How This Document is Organized

This document is an Environmental Assessment and Regulatory Impact Review (EA/RIR) for establishing 2018 Pacific halibut catch limits for International Pacific Halibut Commission (IPHC) Regulatory Area 2A (Figure 1) in U.S. waters off the coast of Washington, Oregon, and California. An EA/RIR provides assessments of the environmental impacts of an action and its reasonable alternatives (the EA), and the economic benefits and costs of the action alternatives, as well as their distribution (the RIR). This EA/RIR addresses the statutory requirements of the Northern Pacific Halibut Act of 1982 (Halibut Act), the National Environmental Policy Act (NEPA), and Presidential Executive Order 12866 to provide the analytical background for decision-making.

- Section 1 provides the “Purpose and Need” for this action and discusses the history of this action.
- Section 2 describes the alternatives.
- Section 3 describes the physical, biological, and socio-economic environment that could be affected by the alternatives.
- Section 4 is an analysis of the potential effects of the alternatives considered on the human environment.
- Section 5 presents the Finding of No Significant Impact (FONSI).
- Section 6 addresses consistency of the proposed action with the Northern Pacific Halibut Act.
- Section 7 provides the Regulatory Impact Review (RIR)
- Section 7 provides the list of preparers and persons consulted
- Section 8 provides a bibliographic reference for this document.

Figure 1. IPHC regulatory areas. Source: IPHC



1.2 Purpose and Need

The purpose of the proposed action is to set 2018 catch limits for Pacific halibut in IPHC Regulatory Area 2A. Pursuant to the purpose of Article III of the Convention between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea (Convention), Mar. 2, 1953, 5 U.S.T. 5, and the Protocol Amending the Convention Between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea (Protocol), Mar. 29, 1979, 32 U.S.T. 2483, this action is needed to set “levels which will permit the optimum yield from [the Pacific halibut] fishery, and maintain the stocks at those levels.”

1.3 History of this Action

The federal governments of Canada and the United States (U.S.) adopt domestic regulations to manage the portions of the fishery in their respective waters. In the United States, the Northern Pacific Halibut Act of 1982 at [16 U.S.C. § 773c](#) provides that the Secretary of Commerce (Secretary) shall have general responsibility to carry out the Halibut Convention between the U.S. and Canada and that the Secretary shall adopt such regulations as may be necessary to carry out the purposes and objectives of the Convention and the Halibut Act. The International Pacific Halibut Commission (IPHC) is responsible for drafting annual regulations, conducting the annual halibut survey, and producing stock assessments. The stock assessment produces a range of total allowable catch (TAC) amounts, which are presented to the U.S. and Canadian Commissioners, who in consultation with members of the public, decide on the final TAC for each management area. In some cases, the U.S. and Canada may set catch limits through domestic rulemaking processes that are more restrictive than those put forth by the IPHC.

The respective federal governments may set domestic subarea allocations and consequent management measures. For the U.S. in Area 2A, NMFS West Coast Region is responsible for allocation and management with close coordination with the Pacific Fishery Management Council (Council) and the Washington, Oregon, and California state agencies (Washington Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, and California Department of Fish and Wildlife). The allocation of Pacific halibut within Area 2A is described in the Catch Sharing Plan (Plan) developed by the Council and adopted by NMFS.

In 1995, NMFS implemented a Council-recommended long-term Plan ([60 FR 14651](#), March 20, 1995). In each of the intervening years between 1995 and the present, minor revisions to the Plan have been made to adjust for the changing needs of the fisheries.

At the 2018 IPHC annual meeting, the United States and Canadian Commissioners did not reach an agreement on specific catch limit recommendations for 2018, although the United States and Canada voiced consensus that some reduction in catch limits relative to 2017 in all Areas was appropriate. Therefore, the IPHC did not make a recommendation to the Secretary of State to revise the catch limits that were recommended and implemented in 2017. The U.S. and Canadian Commissioners did endorse season dates, specific catch limits, Catch Sharing Plans, and management measures that would apply to their respective waters. All of the catch limits and Plan allocations that were considered for recommendation by the IPHC in 2018 were intended to

reduce the harvest of halibut compared to 2017 because the biological information presented by the IPHC scientists indicated that the spawning biomass, and the biomass available to the halibut fisheries, is projected to decline and the rate of fishing mortality is projected to substantially increase over the next several years if harvests are not reduced relative to 2017.

This analysis examines alternative catch limits in Area 2A. NMFS is considering alternative catch limits for Areas 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E under a separate environmental assessment. These actions are independent due to the distinct differences in geography, fishery management plan, and regulatory regime.

1.4 Public Participation

The management of Pacific halibut has many stages where stakeholders can participate. Fishery participants may suggest changes to the catch sharing plan annually, which are considered by the Council, but are not considered in this action because this action pertains only to catch limits for 2018 and the 2018 catch sharing plan changes were approved by the Council and IPHC under a separate action. Both actions are independent of each other. The [IPHC annual interim meeting](#) occurs in November, where the stock assessment for the year is released and the IPHC makes a recommendation of catch limits for the following year. At the annual IPHC meeting in January, catch limits are discussed and public comment solicited. After the IPHC annual meeting concluded without agreement on 2018 catch limits, NMFS took action to prepare interim final rules for IPHC Regulatory areas off of Alaska and the West Coast (Area 2A). The public was informed through a listserve notice and website posting that comments received under 83 FR 4175 regarding catch limits for Area 2A would be accepted and considered as relevant to a potential rule setting 2018 Area 2A catch limits. Oregon Department of Fish and Wildlife and California Department of Fish and Wildlife commented in support of the U.S. Commissioner-suggested catch limit of 1,190,000 pounds (Alternative 2). The Northwest Indian Fisheries Commission commented in support of a catch limit of 1,340,000 pounds, which was the 2017 Area 2A catch limit (Alternative 1/Status quo). This catch limit was also supported by the IPHC conference and processor advisory boards. Washington Department of Fish and Wildlife initially supported the U.S. Commissioner-suggested catch limit of 1,190,000 pounds, but submitted a letter to NMFS on March 6, 2018 that concurs with the treaty tribes for a catch limit of 1,330,000 pounds.

1.5 Definitions and Explanations

1.5.1 Definitions

- *Total allowable catch (TAC)*: the amount of halibut allocated under the Plan. It is equivalent to “catch limit” used in this document, and Fishery Constant Exploitation Yield (FCEY) (used in the IPHC reference documents).
- *Total constant exploitation yield (TCEY)*: the mortality of halibut over 26 inches associated with directed harvests from commercial discards, bycatch, and the total allowable catch (TAC) allocated in the Plan. For Area 2A TCEY is greater than FCEY, and FCEY is equivalent to the catch limits established under this proposed action.

- *Spawning potential ratio (SPR) and spawning biomass (SB):* An $F_{46\%}$ SPR is a reference point is a level of fishing intensity in a fish achieving 46% of its spawning potential over the course of its lifetime relative to what it would have achieved as part of an unfished stock. Lower values indicate higher fishing intensity. The current level of female spawning biomass (SB) for halibut is estimated to be approximately 40 percent of the equilibrium condition in the absence of fishing ($SB_{40\%}$), with a 6 out of 100 chance that the stock is below $SB_{30\%}$. The IPHC's harvest policy sets a threshold reference point of $SB_{30\%}$ and the limit reference point of $SB_{20\%}$ as triggers of reductions in halibut harvest rates.
- *IPHC Interim management procedure:* The IPHC has used an $F_{46\%}$ SPR as an interim management procedure, or “handrail” to guide management decisions, in the absence of an approved harvest policy based on reference limits or targets.

1.5.2 Explanations of Key Concepts

How was the setline survey adjusted to account for concerns in 2017?

Separate from the IPHC stock calculations, the 2016 weight-per-unit-effort (WPUE) for Area 2A was applied to the 2017 stock assessment, which resulted in a TCEY of 1.06 million pounds. The TCEY of 1.06 million pounds was used to mitigate uncertainty in the 2017 survey, which occurred months later than in previous years, and coincided with a hypoxic area and reduced landings at survey stations with previously consistent catch. See section 3.2.1.1 on Pacific halibut biomass and abundance.

What is apportionment?

IPHC uses an apportionment structure that is based on the WPUE of the setline survey that estimates the distribution of the stock among management areas. Generally, the IPHC and NMFS have relied on these methods to help reduce the risk that harvests in a specific Area could cause localized depletion of that resource.

How are halibut fishery catch limits determined?

Halibut fishery catch limits are the result of a multi-step process by the IPHC, with allocative input from U.S. and Canadian fishery management organizations, with the objective of determining how much can be harvested by the commercial halibut fishery, given the IPHC's goals for stock conservation. The current harvest policy for Pacific halibut is based on two harvest targets: the distribution of harvest rates among Areas, and scale of that harvest at the coastwide level. The process starts with IPHC staff determining the scale or size of the coastwide removals (generally, halibut greater than 26 inches in length (O26), based on the stock assessment and target SPR) and then estimating its distribution or apportionment among each of eight Areas: 2A, 2B, 2C, 3A, 3B, 4A, 4B, and 4CDE (IPHC 2018c) using the setline survey weight per unit effort adjusted for gear saturation and survey timing differences among areas and the relative target harvest rates: 1.0 for Areas 2A-3A, and 0.75 for Areas 3B-4CDE.

The IPHC does not currently have an approved harvest policy based on reference limits or targets. The IPHC has used an $F_{46\%}$ SPR as an interim management procedure, or “handrail” to guide management decisions. Using the stock distribution by area, the IPHC's staff provide a

target distribution of the total amount of coastwide yield available for harvest, referred to as the Total Constant Exploitation Yield, or TCEY. U26 mortality is accounted for in the SPR calculation, but not in the area-specific removals, as these fish are capable of redistributing to other Areas prior to becoming accessible to the directed halibut fisheries.

The third step in the allocation of harvest is to subtract all other removals of O26 halibut from the TCEY, in order to determine the Fishery Constant Exploitation Yield or FCEY (IPHC 2018a, IPHC 2018c). The FCEY is calculated such that all O26 removals sum to the TCEY target within each Area, and at the coastwide level. The FCEY includes commercial fishery limits in all areas, and recreational, tribal, and incidental fisheries in Area 2A. Non-FCEY removals in 2A include wastage and bycatch in the trawl and hook-and-line fisheries and are assumed to remain constant at the previous year's level (e.g., unguided recreational landings) or rate (e.g., discard mortality).

The IPHC staff provides catch limit calculations in advance of the IPHC Annual Meeting in January, which are distributed to allow the halibut stakeholders to discuss and provide comment to the IPHC. Once the Annual Meeting commences, the IPHC considers all of the input—public comment, recommendations from its advisory bodies, and the catch limit calculations—and then adopts fishery catch limits and other measures that seek to balance the advice it has received, with stock conservation being the primary consideration.

Since 2013, alternative harvest levels representing lower and higher levels of removals have also been presented, and evaluated with respect to risk against stock and fishery metrics, in a decision table (IPHC 2018c).

The IPHC's harvest policy represents a target level of removals from the application of the IPHC's interim management procedure, but the policy is not binding on the Commissioners. As illustrated by the IPHC decision table, the staff provides a broad suite of options to inform the Commission's decisions. Unlike the Magnuson-Stevens Act, the Halibut Act does not include specific provisions that require Commissioners to allocate quotas within, for example, an overfishing threshold; their broad mandate is the conservation of the halibut stock at levels that will permit the optimum yield from that fishery, and maintain the stocks at those levels.

In the last decade, the IPHC coastwide catch limit recommendation has exceeded either staff recommendations (from 2006 through 2012), formal IPHC harvest policies commonly known as the "blue line" (2013–15, when they were in place) or the current interim management procedure (since 2016), in nine of twelve years, and the area-specific catch limit recommendations have exceeded either formal IPHC harvest policies (when they were in place) or the current interim management procedure in all areas at least once, and for some areas in most years (see IPHC 2018b).

2.0 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This analysis examines three alternative Pacific halibut catch limits in Area 2A for 2018. NEPA requires that an EA analyze a reasonable range of alternatives consistent with the purpose and need for the proposed action. The alternatives in this chapter were designed to accomplish the

stated purpose and need for the action. All of the alternatives are either required for consideration under NEPA (Alternative 1—status quo), or are directly responsive to the purpose and need (Alternatives 2 and 3), to set catch limits that, in the absence of action by the IPHC.

Alternative 1 (No Action/Status Quo)

Alternative 1 would maintain the 2017 Total Constant Exploitation Yield (TCEY) of 1.47 million pounds and resulting Area 2A Total Allowable Catch (TAC) of 1.34 million pounds. 2017 Pacific halibut catch limits and regulations will remain in effect until superseded by regulations implemented by the IPHC (83 FR 10390), or through domestic regulations implemented by Canada or the U.S. *See* 2017 final rule for Area 2A (82 FR 18581).

Alternative 2 (Preferred Alternative)

Alternative 2 sets a TCEY of 1.32 million pounds and resulting Area 2A TAC of 1.19 million pounds. This limit was suggested by the U.S. Commissioners but not recommended by the IPHC.

Alternative 3 (IPHC interim management procedure)

Under Alternative 3, the TCEY for Area 2A would be reduced to 0.59 million pounds under the IPHC’s interim management procedure ($F_{46\%}$ SPR), resulting in a TAC of 0.47 million pounds for Area 2A.

Figure 2. Catch limit suballocations under proposed 2018 Catch Sharing Plan.

	Alt 1 (pounds)	Alt 2 (pounds)	Alt 3 (pounds)
TCEY	1,470,000	1,320,000	590,000
TAC	1,340,000	1,190,000	470,000
Percent less than Alt 1	-	11%	65%
Tribal (including ceremonial and subsistence)	469,000	416,500	164,500
Commercial Directed	227,287	201,845	79,720
Commercial Incidental Salmon	40,110	35,620	14,068
Commercial Incidental Sablefish	50,000	50,000	0
WA	260,076	225,366	108,758
OR	258,687	229,730	90,734
CA	34,840	30,940	12,220

For purposes of this analysis we provide the following clarifications:

First, under all of these alternatives, NMFS assumes if catch limits were established for Area 2A, that similar catch limits would apply in the other Areas that are not directly regulated by this action—Areas 2C, 3A, 3B, 4A, 4B, 4C, 4D and 4E (Alaska), and Area 2B (British Columbia, Canada). For example, under Alternative 1, this analysis assumes that if status quo catch limits (2017 catch limits) are applied in Area 2A, the same catch limits (2017 catch limits) would also apply in Alaska’s and Canada’s Areas; Alternative 3 assumes that all Areas would apply the IPHC interim management procedure. This assumption is made for purposes of reducing

complexity that could occur if there are multiple alternative catch limits selected for those Areas as compared to the catch limits selected for Area 2A.

Second, this analysis also assumes that all other sources of mortality not affected by catch limits remain at the same level as those observed in 2017. This assumption is supported by data from IPHC (IPHC 2018b) that shows that interannual variability of these other sources of mortality is not expected to change substantially.

Third, the reader is reminded that the scope of this action is limited. These alternatives analyze the effects of establishing different catch limits for Area 2A and only for one year—2018. While this analysis notes that catch limits established in 2018 could have longer term impacts on the halibut resources over the reasonably foreseeable future (until 2021 based on the best available information from IPHC scientists—*see* IPHC 2018a, IPHC 2018c), the alternatives considered under this action are intended to be of limited duration. Under the provisions of the Convention and Halibut Act, the IPHC has authority to recommend catch limits for 2019 and future years. Therefore, this analysis assumes that the impact of this action is limited to only the effects of modifying catch limits for 2018, and that the annual process used by the IPHC to recommend catch limits for adoption by the U.S. and Canada will be used in future years. This assumption is reasonable given the long history of the IPHC recommending, and NMFS implementing, annual catch limits and management measure regulations. NMFS has documented only two instances, once in 1990 (55 FR 11929, March 30, 1990), and now in 2018, when the IPHC has been unable to come to agreement on catch limits applicable to the U.S.

Alternatives Considered but not Analyzed Further

In 2018, IPHC scientists provided information on the implications of a broad range of potential catch limits, and their potential impact on the halibut resource (IPHC 2018a and 2018c). The potential implications of these alternative catch limits are best summarized in the assessment and harvest decision tables provided by IPHC staff (IPHC 2018c; IPHC 2018a and 2018d respectively). The harvest decision table prepared by the IPHC describes the implications of catch limits greater than those implemented in 2017, and a range of other catch limits, including no fishing.

Catch limits that are greater than those implemented in 2017 (Alternative 1) are not analyzed further because under the provisions of the Convention, the U.S. could not implement catch limits that are more permissive (i.e., less restrictive than) those implemented through the IPHC. Similarly, this analysis did not consider alternatives that would implement catch limits that would constrain catch more than the IPHC's interim management procedure, considered here as Alternative 3. More constraining alternatives would be inconsistent with the IPHC's interim management procedure of managing to optimum yield in the Convention, and would be more restrictive than catch limits adopted by the IPHC based on scientific information it has received in past years. More constraining limits would run counter to the provisions of the purpose and need statement that clarifies that this action should set "levels which will permit the optimum yield from [the Pacific halibut] fishery, and maintain the stocks at those levels".

3.0 AFFECTED ENVIRONMENT

This section of the document describes the existing fishery and the resources that would be affected by the alternatives. The physical environment is discussed in Section 3.1, the biological characteristics of Pacific halibut and species interacting with the Area 2A halibut fishery are discussed in Section 3.2, and the socio-economic or human environment is discussed in Section 3.3. This information is primarily drawn from Section 3.0 of the 2014 Pacific halibut EA (NMFS 2014),

3.1 Physical Environment

Pacific halibut in Area 2A reside off the coasts of Washington, Oregon, and California. In the North Pacific Ocean, the large, clockwise-moving North Pacific Gyre circulates cold, sub-arctic surface water eastward across the North Pacific, splitting at the North American continent into the northward-moving Alaska Current and the southward-moving California Current. Along the U.S. West Coast, the surface California Current flows southward through the U.S. West Coast Exclusive Economic Zone (EEZ), management Area 2A for Pacific halibut. The productivity in this area comes from major nutrient upwelling, due to the southward moving California Current and northward-moving California Undercurrent, and coastal winds. Physical topography off the U.S. West Coast is characterized by a relatively narrow continental shelf. The 200 meter (m) depth contour represents a shelf break closest to the shoreline off Cape Mendocino, Point Sur, and in the Southern California Bight and widest from central Oregon north to the Canadian border as well as off Monterey Bay. Deep submarine canyons pocket the EEZ, with depths greater than 4,000 m common south of Cape Mendocino. Habitat in Area 2A has been categorized in the Pacific Coast Groundfish Fishery Management Plan (FMP) into seven major habitat types (Estuarine, Rocky Shelf, Nonrocky Shelf, Canyon, Continental Slope/Basin, Neritic Zone, Oceanic Zone). These habitat categories include all waters from the mean higher high water line, and the upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon, and California seaward to the boundary of the U.S. EEZ. Longline gear in the groundfish fisheries has been shown to have little impact on habitat, and the halibut fishery is shorter in duration and in geographic scope than the groundfish fishery. The longline gear used by the halibut commercial and tribal fisheries may come in contact with the bottom habitat.

3.2 Biological Environment

This section describes the species that may be directly or indirectly affected by the alternatives. First, this section describes Pacific halibut, the species directly subject to the alternatives evaluated in this EA. Second, this section reviews species that may be incidentally affected, because they are caught incidentally in Pacific halibut fisheries (yelloweye rockfish), or because the fisheries targeting other species but have an incidental catch allowance of Pacific halibut (sablefish and salmon). Finally, this section describes various legally protected species covered by the Endangered Species Act (marine mammals, turtles, eulachon, salmon, listed seabirds), Marine Mammal Protection Act, and the Migratory Bird Treaty Act. With respect to incidentally affected species, this section discusses yelloweye rockfish that live along the coast, which is one of the two overfished species managed under rebuilding plans through the Pacific Coast Fishery Management Plan. Cowcod, the remaining overfished species, is not discussed here because it is not caught in substantial numbers or does not occur in the same area as the halibut fishery. The

Puget Sound rockfish species listed under the ESA (i.e., bocaccio and yelloweye) have been determined to be separate species from stocks on the coast, and therefore are discussed separately in the Protected Species section below with the remaining ESA-listed West Coast species (i.e. marine mammals, sea turtles, salmon, and seabirds).

3.2.1 Halibut

Pacific halibut (*Hippoglossus stenolepis*) along the North American (Pacific) Coast are managed by the IPHC and range from Nome, Alaska to Santa Barbara, California. Most spawning in Pacific halibut occurs in the Gulf of Alaska. During spawning, which generally occurs from November to March, halibut move into deep water, where the eggs are fertilized. The eggs develop into larvae and grow, drifting slowly upward in the water column. Passive transport of larvae via ocean currents pushes them west and north along the Aleutian Islands and into the Bering Sea (IPHC). Young fish then settle to the bottom in the shallow feeding areas. Following two to three years in the nursery areas, juvenile halibut generally counter migrate, moving into more southerly and easterly waters, including Area 2A. Migration decreases as halibut grow older and larger (more detail in section 3.2.1.2). Because Area 2A includes the southern-most range of Pacific halibut and the major spawning grounds are north and west of Area 2A, the population of halibut in Area 2A is substantially smaller than in other areas of its range. Pacific halibut reach maturity at approximately 8 years for males and 12 years for females. Halibut feed on plankton during their first year of life. Young halibut (1 to 3 years old) feed on euphausiids (small shrimp-like crustaceans) and small fish. As halibut grow, fish make up a larger part of their diet. Larger halibut eat other fish, such as herring, sand lance, capelin, smelt, pollock, sablefish, cod, and rockfish. They also consume octopus, crabs, and clams.

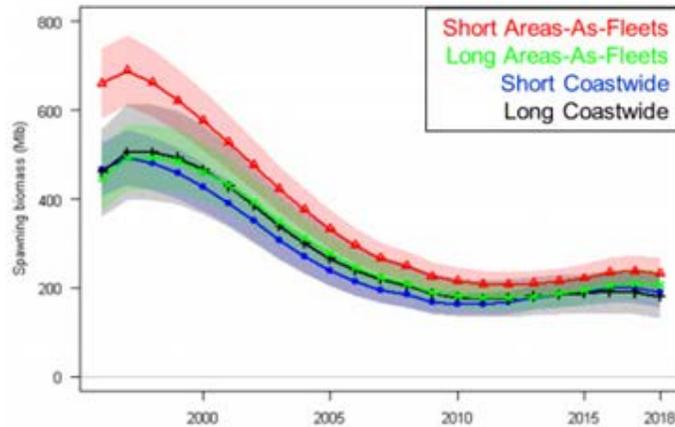
3.2.1.1 *Biomass and abundance*

The IPHC assesses the coastwide biomass of halibut, including fish that are caught in the IPHC setline survey and to the commercial halibut fishery. The IPHC estimates the distribution of the coastwide stock based on survey catch rate among Areas using information from its annual setline survey. The IPHC uses an ensemble approach to its coastwide stock assessment for the Pacific halibut stock, described in its assessment (IPHC 2018c). In this approach, multiple models are included in the estimation of management quantities. For 2017, these included two coastwide models and two areas-as-fleets models, in each case one using more comprehensive data available only since 1996, and the other using the full historical record (see Figure 3). The results of the 2017 assessment indicate that the stock declined continuously from the late 1990s to around 2010 (IPHC 2018c).

The ensemble model approach was developed to more accurately convey the uncertainty in the estimation of stock status and as a more robust assessment tool to avoid abrupt changes in the halibut stock assessment, such as that occurring between annual cycles in 2011 and 2012. In 2012, IPHC staff reported that then-recent stock assessments for Pacific halibut had consistently overestimated biomass and underestimated harvest rates due to a retrospective bias in the stock assessment. Although the 2012 assessment was corrected and the assessment results tracked observed halibut trends, stock size estimates decreased by approximately 30 percent compared to

previous assessments, primarily due to a flat rather than increasing trend over the most recently assessed years.

Figure 3. Spawning biomass estimated from each of the four models included in the 2017 stock assessment ensemble. Series indicate the maximum likelihood estimates, shaded intervals indicate approximate 95% confidence intervals (Source: IPHC 2018c)



In general, recruitment has decreased substantially since the highs of the 1980s. Several factors affect recruitment of new fish into the population, as noted in IPHC 2018c (p.8):

Based on the two long time-series models, average Pacific halibut recruitment is estimated to be higher (41 and 76% for the coastwide and AAF models respectively) during favorable Pacific Decadal Oscillation (PDO) regimes, a widely used indicator of productivity in the north Pacific...Pacific halibut recruitment estimates IPHC-2018-AM094-08 [IPHC 2018c] Page 9 of 16 show the largest recent cohorts in 1999 and 2005. Cohorts from 2006 through 2013 are estimated to be smaller than those from 1999-2005...This indicates a high probability of decline in both the stock and fishery yield as recent recruitments become increasingly important to the age range over which much of the harvest and spawning takes place.

As described by the IPHC (2018b), although there has been a very strong trend of declining weight-at-age in all Areas in recent decades, there are marked differences in the magnitude of this decline among Areas. The coastwide trend is driven largely by trends in Area 3 (corresponding to the central and western Gulf of Alaska—see Figure 6) where the bulk of the commercially available biomass occurs. There do not appear to be consistent or strong trends from 2010 to 2017 in the area-specific data (IPHC 2018b).

Based on the most recent stock assessment conducted, the IPHC notes that:

Coastwide mortality for all sizes from all sources in 2017 were estimated to be 42.4 million pounds (~19,200 t), up slightly from 41.8 million pounds (~18,960 t) in 2016 (p. 3).

Age distributions in 2017 from both the setline survey and fishery remained similar to those observed in 2011–16, but with somewhat fewer fish younger than the 2005 cohort (age-12), indicating that recent coastwide recruitment events have been lower than in previous years. Individual size-at-age continues to be very low relative to the rest of the time-series, and there has been little clear change over the last several years (IPHC 2018c, p. 7).

The results at the end of 2017 indicate that the Pacific halibut stock declined continuously from the late 1990s to around 2010, as a result of decreasing size-at-age, as well as somewhat weaker recruitment strengths than those observed during the 1980s. Pacific halibut recruitment estimates show the largest recent cohorts in 1999 and 2005; cohorts from 2006 through 2013 are estimated to be smaller than any recruitment from 1999–2005. This indicates a high probability of decline in both the stock and fishery yield as recent recruitments become increasingly important to the age range over which much of the harvest and spawning takes place (IPHC 2018a, p. 7).

The stock is projected to decrease gradually over the period from 2018–20 for removals around the reference spawner per recruit (SPR, $_{46\%}$) level (31 million pounds, ~14,060 t). There is a relatively small chance (21%) that the stock will decline below the threshold reference point (SB $_{30\%}$) in projections for all the levels of TCEY up to 40 million pounds (~18,100 t) evaluated over three years; for TCEYs exceeding that level, the probability begins to increase rapidly (IPHC 2018c, p. 12).

Of particular note, even under Alternative 3 (IPHC interim management procedure), the best available scientific information suggests that over the foreseeable future (2018 – 2021) the halibut resource is projected to decline. The 2018 stock assessment provides additional detail on the potential trends in the halibut stock, uncertainties in the assessment, and additional factors that may impact the overall stock status and harvestable surplus of abundance of halibut (IPHC 2018a).

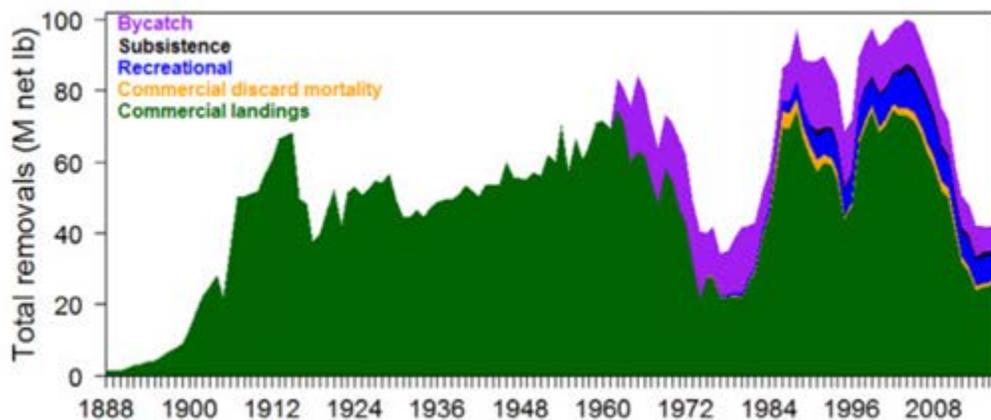
At this time, the IPHC does not have an approved harvest policy based on reference limits or targets. The IPHC interim management procedure of $F_{46\%}$ SPR guides management decisions and manage to optimum yield as put forth in the Convention. For reference, groundfish off the U.S. west coast are managed under a harvest policy through the Fishery Management Plan, which describes control rules that use reference points for setting biologically sustainable catch limits (PFMC 2016). These rules consider both data availability and stock status, and specify an overfishing limit (OFL) and allowable biological catch level (ABC). The ABC is always specified below the OFL such that it provides for scientific uncertainty. A fishing mortality rate at $F_{40\%}$ is expected to reduce the spawning biomass per recruit (equivalent to lifetime egg production) to 40% of its equilibrium value for an unfished stock. A limit reference point between $F_{35\%}$ and $F_{40\%}$ is well defined in the literature and in technical guidance NMFS uses to ensure compliance with Magnuson-Stevens Act National Standards as a proxy for F_{MSY} (Restrepo et al., 1998) and is used as such for most groundfish stocks where F_{MSY} is not directly

estimated (Clark 1993, Gabriel and Mace 1999, Mace 1994). Gabriel and Mace (1999) found this fishing mortality range to be appropriate for stocks with average to low resiliency. Default MSY proxies for the West Coast are $F_{30\%}$ for flatfish, $F_{50\%}$ for rockfish (including thornyheads), and $F_{45\%}$ for roundfish species such as sablefish and lingcod. The default FMSY proxies ($F_{30\%}$, $F_{40\%}$, $F_{45\%}$, and $F_{50\%}$) are science-based values that are expected to be modified from time to time as scientific knowledge improves.

Since 2014, the IPHC has set catch limits that result in a total fishing impact that would be considered conservative by fishery management scientists (IPHC 2018a). This has not always been the case. Fishing mortality was most intense for a 15-year period from 1999 through 2013, with the harvest rate consistently exceeding the $F_{40\%}$ harvest rate. As previously mentioned, during the mid to late 2000s, the halibut stock assessment model then in use was misspecified resulting in a retrospective bias that overestimated biomass. Prior to 2014, fishing intensity rates of up to $F_{24\%}$ occurred, far greater than amounts generally considered to be sustainable in West Coast groundfish fisheries. This period of intense harvest likely contributed to later declines in biomass. During this period, the stock also experienced reduced recruitment subsequent to very strong year classes through the 1980s and 1990s.

Figure 4 shows that during the periods of high removal, the majority of the mortality on the halibut stock was due to commercial catch (also see Table C-3 in IPHC 2018b). In 2017 the three top sources of removals were commercial harvests (including discard mortality in the commercial fishery, i.e., “wastage”) that accounted for 65% of the removals, recreational harvests that accounted for 19%, and commercial groundfish fishery bycatch that accounted for 14% of removals. Restricting the commercial halibut fishery catch controls a significant portion of the total mortality on the stock. Historically, limiting commercial catch has been key to the conservation of the halibut resource.

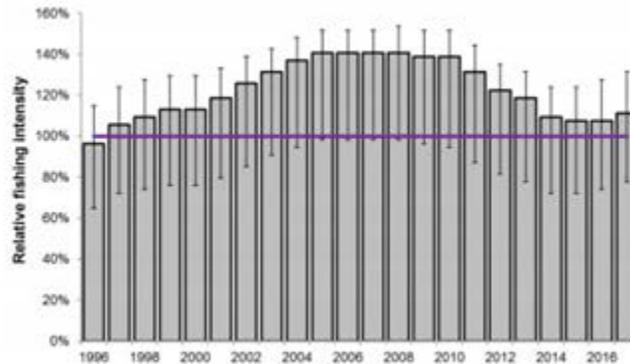
Figure 4. Annual sources of mortality of Pacific halibut (Coastwide)(Source: IPHC 2018c)



Under the Convention, halibut are to be managed to optimum yield from the fishery, and maintain the stocks at those levels. As part of the 2017 stock assessment process, the IPHC did present an assessment of the status of the halibut stock that characterized its status relative to

what the IPHC staff would consider an allowable catch limit. This would be analogous to an ABC in the context of groundfish fisheries off the West Coast. The IPHC has also presented an assessment of fishing intensity relative to the IPHC’s interim management procedure ($F_{46\%}$), and in all recent years, fishing intensity has been greater than the current $F_{46\%}$ SPR (see Figure 5).

Figure 5. Recent estimated fishing intensity (based on the Spawning Potential Ratio) relative to the SPR=46% reference level (horizontal line). Vertical lines indicate approximate credible intervals from the stock assessment ensemble (Source: IPHC 2018a)



The current level of female spawning biomass (SB) for halibut is estimated to be approximately 40 percent of the equilibrium condition in the absence of fishing ($SB_{40\%}$), with a 6 out of 100 chance that the stock is below $B_{30\%}$. The IPHC’s harvest policy sets a threshold reference point of $SB_{30\%}$ and the limit reference point of $SB_{20\%}$ as triggers of reductions in halibut harvest rates. A more detailed description of $SB_{30\%}$ and $SB_{20\%}$ is provided in Hicks and Stewart (2017). The harvest control rules of $SB_{30\%}$ and $SB_{20\%}$ have not been triggered, even during the most recent years of relatively low spawning biomass. Generally speaking, the harvest rates from 2014–17 are considered risk-averse relative to short or long term halibut resource sustainability, with catch corresponding to a harvest rate at or above $F_{40\%}$ during this time period. Setting catch limits for 2018 equal to those in 2017 (Alternative 1) would rate at an estimated $F_{38\%}$.

3.1.1.2 Distribution and Migration

The distribution of the halibut resource has been a topic of considerable research and interest, particularly in recent years. The IPHC stock summary documents (IPHC 2018a) note that regulatory Areas have been used for distributional summary historically, though population-level information suggests that broader regions (with the exception of Area 4B) may be more biologically meaningful (Seitz et al. 2017). Trends over the last five years indicate that population distribution, measured either via the halibut greater than 32 inches in length (O32) component of the setline survey catch or all sizes has been relatively stable (Figure 6). In recent years, there has been an increasing proportion of the coastwide stock occurring in Area 2 and a decreasing proportion occurring in Area 3 (IPHC 2018a). It is unknown to what degree either of these periods corresponds to historical distributions from the mid-1900s or to the average distribution likely to occur in the absence of fishing mortality.

In 2015, the IPHC initiated a new tagging pilot program that is aimed at tagging halibut that are intercepted in the NMFS trawl surveys. The program is intended to be part of a long-term monitoring effort to examine the connectivity of Bering Sea halibut, primarily juveniles, with the rest of the halibut stock in other Areas. The scale of the tagging research program is not such that the study would be able to determine specific movement rates of halibut, but the tag recoveries should inform managers about the movement of halibut among Areas and provide insight about the changes in these pathways over time. Tagging information collected previously suggests that most halibut, though capable of migrating long distances, are recovered in the regulatory area of tagging. Eighty-four percent of halibut less than 65 cm tagged in Area 2A were recovered in Area 2A. This was a small sample size, and only 19 were recovered. A small percentage (2 percent) of halibut tagged in Area 4 were found in Area 2A (IPHC).

Figure 6 illustrates the estimated distribution of the halibut stock greater than 32 inches in length (O32) across the Areas. The observed distribution of the stock available to the directed fisheries in each year will reflect not only the historical fishing effort in each Area, but also the interaction of recruitment distribution and movement rates (IPHC 2018b).

Figure 6. Time series of stock distribution based on O32 setline survey weight per unit of effort by Area (net lb./skate) (Source: IPHC 2018b).

Year	2A	2B	2C	3A	3B	4A	4B	4CDE	Total
1993	1.6%	7.0%	7.4%	35.1%	24.7%	9.1%	9.5%	5.5%	100.0%
1994	1.5%	8.8%	8.6%	31.7%	25.0%	9.6%	9.6%	5.3%	100.0%
1995	1.3%	10.1%	9.3%	31.2%	24.9%	9.1%	9.0%	5.1%	100.0%
1996	1.3%	8.1%	8.0%	30.2%	27.4%	10.0%	9.0%	6.1%	100.0%
1997	1.3%	6.2%	8.1%	33.4%	24.8%	10.9%	9.0%	6.3%	100.0%
1998	1.4%	5.2%	6.9%	27.0%	29.7%	13.6%	8.6%	7.6%	100.0%
1999	1.4%	4.4%	5.8%	26.0%	33.4%	13.3%	7.5%	8.1%	100.0%
2000	1.4%	5.3%	6.1%	30.8%	28.3%	13.0%	6.6%	8.6%	100.0%
2001	1.4%	6.7%	7.5%	33.0%	25.6%	11.2%	5.4%	9.2%	100.0%
2002	1.1%	6.8%	8.5%	39.0%	21.6%	10.4%	4.3%	8.3%	100.0%
2003	1.1%	5.5%	7.8%	37.9%	24.7%	10.1%	4.0%	8.8%	100.0%
2004	1.3%	5.3%	5.7%	45.0%	21.4%	9.2%	3.8%	8.3%	100.0%
2005	1.5%	6.1%	7.1%	46.1%	18.6%	9.0%	4.1%	7.5%	100.0%
2006	1.3%	6.2%	7.0%	42.7%	20.5%	8.3%	4.9%	9.1%	100.0%
2007	1.2%	6.8%	7.2%	42.0%	20.8%	7.7%	6.0%	8.2%	100.0%
2008	1.3%	7.9%	7.6%	39.6%	18.4%	9.1%	6.8%	9.2%	100.0%
2009	1.1%	10.0%	7.5%	35.5%	19.3%	9.4%	6.4%	10.8%	100.0%
2010	1.6%	11.2%	8.3%	36.0%	16.8%	8.6%	6.1%	11.3%	100.0%
2011	2.0%	11.6%	10.4%	36.1%	14.8%	8.1%	6.2%	10.8%	100.0%
2012	1.7%	12.1%	12.1%	38.1%	13.4%	7.4%	4.7%	10.5%	100.0%
2013	1.9%	13.6%	14.2%	32.9%	13.0%	6.8%	5.8%	11.9%	100.0%
2014	2.0%	12.9%	13.9%	34.2%	12.3%	7.0%	4.9%	12.8%	100.0%
2015	2.4%	14.1%	13.9%	31.1%	13.1%	6.8%	4.9%	13.7%	100.0%
2016	2.0%	13.2%	14.8%	33.5%	13.3%	6.0%	4.5%	12.6%	100.0%
2017	1.7%	11.3%	16.6%	35.6%	10.0%	6.6%	4.8%	13.3%	100.0%

Determining how limits should be apportioned across the areas is a challenge in setting area-specific limits under a coastwide assessment model. Pacific halibut are managed as a single coastwide stock, and the IPHC’s interim management procedure uses area-specific survey information to apportion biomass among the areas. The procedure recognizes the value of biocomplexity across the geographic range of the Pacific halibut stock. Little is known about the exact interplay between geographic regions and, for example, spawning success within the Pacific halibut population, but there may be subtle genetic differences (Drinan et al. 2016) that

may make it beneficial to distribute harvest across all the population instead of potentially over-exploiting one component. Additionally, distributing the harvest provides opportunity for many areas. Balancing the removals against the current stock distribution is likely to protect against localized depletion of spatial and demographic components of the stock that may produce differential recruitment success under changing environmental conditions. This concept of utilizing a ‘portfolio effect’ by distributing harvest in proportion to stock distribution is widely recognized in fisheries management, particularly among salmon stocks (Hilborn et al., 2003, Schindler et al., 2010). This approach provides an additional precautionary buffer against spatial recruitment overfishing.

Apportioning stocks among management areas is commonly used in Alaskan groundfish fisheries as well to protect the spatial and demographic components of those stocks. NMFS uses surveys to apportion stocks with broad “coastwide” distribution in the North Pacific (e.g., Pacific cod and sablefish). These methods are described in the most recent SAFE reports (NPFMC 2017a; 2017b). This method has several advantages in that it is based on a standardized annual assessment of stock (survey), is not reliant on commercial fishery data that can mask changes in underlying stock dynamics, and is precautionary towards local depletion and spatial recruitment overfishing. The IPHC continues to discuss and refine apportionment methods; however, the current method represents the best available scientific method for apportioning coastwide catch.

There is evidence that there has been an increase in the proportion of the stock found in Area 2 and a decrease in the proportion of the stock found in Area 3 based on survey WPUE trends. However, it is not known why or how these changes occurred and how it may have affected Area 2A. There is no known spawning population in 2A, but if there is, then the evidence of stock decline in Area 2A supports reducing the catch limit compared to 2017 to maintain that population. Conversely, if halibut in Area 2A interrelate with coastwide spawning populations, then the evidence of coastwide declines supports reducing the Area 2A catch limit to contribute to the sustainability of the coastwide stock.

3.2.2 Groundfish and salmon

This section discusses sablefish, yelloweye rockfish on the coast, and salmon, because these are the species that have the largest interaction with the halibut fisheries. Life history and distribution information is provided in NMFS 2014.

The Pacific halibut fishery commonly intercepts rockfish, as they are found in similar habitat to Pacific halibut and are easily caught with longline gear. Management of overfished rockfish species in halibut fisheries includes monitoring retention of yelloweye rockfish in the sport fishery coastwide and trip limits for the directed halibut fishery. Yelloweye rockfish along the coast are not listed under the ESA but are managed as an overfished species with a rebuilding plan under the Groundfish FMP. Management measures reduce the incidental catch of yelloweye rockfish in halibut fisheries.

Sablefish tend to co-occur with Pacific halibut, favoring similar depths and bottom habitat. The Pacific halibut fishery commonly intercepts sablefish because they co-occur and are easily caught with longline gear. To account for incidental catch of Pacific halibut in management Area

2A, the sablefish primary fishery has a catch allowance for Pacific halibut during years with high enough catch limits. Since 2004, only two years have not had incidental halibut retention (2010 and 2011, when catch limits were 810,000 and 910,000 pounds, respectively).

This section discusses salmon stocks in general; salmon species listed under the ESA and addressed in the biological opinion are further discussed under the Protected Species section below. There are five species of salmon off the Pacific coast: Chinook, coho, chum, pink, and sockeye. Salmon are anadromous, spending from one to several years (depending on the species) in the ocean before returning to the freshwater stream where they were born to spawn. Salmon life history and distribution information is detailed in NMFS 2014. Salmon are targeted with recreational hook and line and commercial troll gear off all three West Coast states. The commercial salmon troll fishery has incidental catch of Pacific halibut and an allocation of halibut in the Plan. Commercial salmon fisheries also have incidental catch of groundfish, including yellowtail rockfish, canary rockfish, lingcod, and sablefish. Pacific halibut and groundfish are caught incidentally. In the commercial salmon troll fishery, Pacific halibut and rockfish may be retained in accordance with annual landing restrictions and halibut may be retained in accordance with the allocation in the Plan.

3.2.3 Protected Resources

Protected species fall under four legal mandates: the Endangered Species Act of 1973 (ESA), the Marine Mammal Protection Act of 1972 (MMPA), the Migratory Bird Treaty Act (MBTA), and Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds).

NMFS prepared a Biological Opinion for the halibut fishery for 2018–22 (NMFS 2018). The NMFS Biological Opinion evaluates the effects of the halibut fishery and the continued implementation of the Catch Sharing Plan (Plan) on listed species under TAC levels previously implemented. The biological opinion concluded that the continuing implementation of the Catch Sharing Plan was not likely to adversely affect Southern Resident killer whales, leatherback sea turtles, humpback whales, blue whales, fin whales, Guadalupe fur seals, north Pacific right whales, sei whales, sperm whales, gray whales, green sea turtles, loggerhead sea turtles, or olive ridley sea turtles. Further, the biological opinion concluded that continuing implementation of the Catch Sharing Plan was likely to adversely affect but not likely to jeopardize Puget Sound/Georgia basin bocaccio and yelloweye rockfish, southern green sturgeon, Lower Columbia river coho, Lower Columbia River Chinook, Puget Sound Chinook, Snake River fall Chinook. The biological opinion also concluded that the continued implementation of the Catch Sharing Plan was not likely to adversely modify critical habitat of Southern Resident killer whales, leatherback sea turtles, Puget Sound/Georgia basin bocaccio, canary rockfish, and yelloweye rockfish, southern green sturgeon, lower Columbia River Chinook, and Puget Sound Chinook. The halibut fishery does not overlap with ESA-designated critical habitat for the remaining listed species; therefore, it was determined that the halibut fishery would have no effect on this critical habitat.

NMFS consulted with the U.S. Fish and Wildlife Service (USFWS), who concurred on NMFS's determination that the halibut fishery is unlikely to adversely affect shot-tailed albatross, California least tern, marbled murrelet, bull trout, and sea otters (USFWS 2017).

Fisheries that interact with marine mammal species listed as depleted, threatened, or endangered may be subject to management restrictions under the MMPA and ESA. NMFS publishes an annual list of fisheries in the *Federal Register* separating commercial fisheries into one of three categories based on the level of serious injury and mortality of marine mammals occurring incidentally in that fishery. The categorization of a fishery in the list of fisheries determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. Pacific halibut fisheries are in Category III, denoting a remote likelihood of, or no known, serious injuries or mortalities to marine mammals. Marine mammals likely affected by the halibut fishery were considered in the Biological Opinion (NMFS 2018); the effects on these marine mammals are discussed in Section 4 of this EA

3.3 Socio-economic Environment

3.3.1 Area 2A Halibut Fishery

The Council, through the Catch Sharing Plan (Plan), allocates halibut among groups of fishermen in Area 2A, off the coasts of Washington, Oregon, and California. To implement the Plan, NMFS applies the Plan framework to the annual Area 2A TAC typically approved and recommended by the IPHC each January. For non-tribal fisheries, the Plan governs allocations of the TAC between components of the commercial and recreational fisheries, which vary annually depending on the amount of Pacific halibut TAC and thresholds in the Plan. Aspects of Area 2A's directed commercial fishery are governed by the IPHC regulations rather than the domestic regulations under the Plan: the commercial fishery opening date(s), duration, and vessel trip limits to ensure that the quota for the non-tribal commercial fisheries is not exceeded.

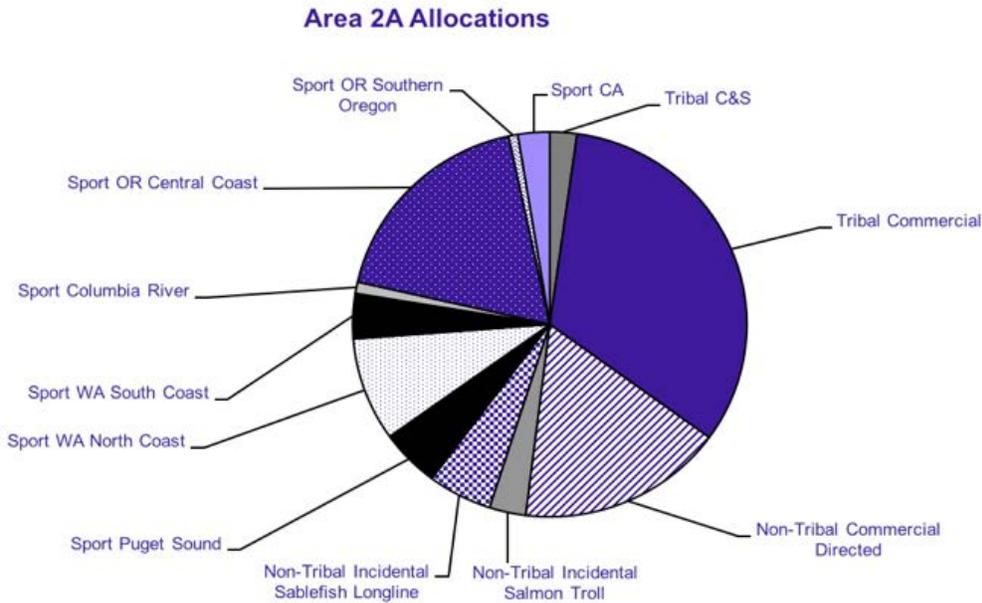
3.3.3 Area 2A Catch Sharing Plan

The Area 2A Catch Sharing Plan contains a framework for fishery management measures. It includes season days of the week, with dates that the states adjust annually. The Plan contains subarea allocation percentages that change according to the level of annual TAC, and also includes information on the sablefish and salmon fisheries, where halibut is caught incidentally. Particulars on the directed fishery targeting halibut are published in the Alaska Region's final rule that contains the IPHC regulations (83 FR 10390). Tribal fisheries are described in the Plan, but are not managed by NMFS. The IPHC approved the changes to the 2018 Area 2A Plan at the annual meeting in January 2018, as it has done in the past, and we expect it to continue to do for the foreseeable future.

The Pacific halibut fisheries in Area 2A are allocated a small percentage, generally less than 2 percent, of the coast-wide TAC. Washington treaty Indian tribes are allocated 35 percent of the Area 2A TAC. The allocation to non-tribal fisheries is divided into four shares: a commercial fishery (30.7 percent) and recreational fisheries in Washington (35.6 percent), Oregon (29.7

percent), and California (4.0 percent). The Plan further subdivides the recreational fisheries into six geographic areas, each with separate allocations and seasons.

Figure 7. Area 2A Catch Sharing Plan Allocations



3.3.4 Tribal Fisheries

Thirteen western Washington tribes possess treaty fishing rights to halibut, including the four tribes that possess treaty fishing rights to groundfish. The majority of the tribes fish inside Puget Sound. Specific halibut allocations for the treaty Indian tribes began in 1986. The tribes did not harvest their full allocation until 1989, when the tribal fleet had developed to the point that it could harvest the entire Area 2A TAC. In 1993, a federal court ruled that certain tribes held treaty rights to catch 50 percent of the harvestable surplus of halibut in the tribes’ combined Usual & Accustomed (U&A) fishing grounds, which the court stated amounts to 35 percent of the 2A TAC. Tribal allocations are divided into a tribal commercial component and the year-round ceremonial and subsistence (C&S) component.

The tribes’ management plan has varied over the years. The tribal management plan contains provisions for both unrestricted fisheries with no landing limits and restricted fisheries with limits as well as a late season fishery that can be set up to have no landing limits or with limits, toward the end of the season

3.3.5 Commercial fisheries

As previously mentioned, there are three commercial fisheries in Area 2A: the directed target halibut fishery and incidental halibut in the salmon and sablefish fisheries. The directed and salmon fisheries receive an allocation of quota, 85 and 15 percent, respectively, of the commercial quota. The sablefish allocation is dependent on the Washington recreational fishery

and receives up to 50,000 pounds when the Washington recreational fishery quota is above 214,110 pounds. Breakdowns under each Alternative found in Figure 2.

4.0 ENVIRONMENTAL CONSEQUENCES

This section examines the environmental consequences that could be expected to result from the implementation of each alternative.

4.1 Impacts to the Physical Environment

Physical impacts generally associated with fishery management actions are effects resulting from changes in the physical structure of the benthic environment because of fishing practices (e.g. gear effects and fish processing discards). Although halibut fishing activity affects the physical environment, no alternative detailed in this EA is expected to have notable or measurable effects on the physical environment.

Fishing for halibut is permitted with hook-and-line gear, which may affect habitat by snagging on rocks, corals and other objects during gear retrieval. Line retrieval may upend smaller rocks and break hard corals, while leaving soft corals unaffected. Invertebrates and other lightweight objects may also be dislodged during fishing for halibut (Johnson, 2002). Spear and other gear are also permitted but their effects on the physical environment are negligible since there is minimal bottom contact. Impacts are discussed in more detail in the Biological Opinion (NMFS 2018).

Mandatory closed areas, known as the Rockfish Conservation Areas (RCA), extend along the coast from the U.S./Canada border south to 40°10' N. latitude. The RCAs provide protection to overfished species habitat because they restrict the use of gear that may cause damage to habitat.

Impacts to the physical environment are minimal and any impacts have been minimized to the extent practicable with time and gear restrictions. Both the directed commercial and tribal commercial fisheries are short in duration; the directed commercial fishery has been open 2-3 days in the last 5 years. These fisheries are limited in geographic scope, since the tribal fishery takes place in Usual and Accustomed areas in Washington, and the directed commercial fishery takes place south of Point Chehalis, Washington, and mostly off the coast of Oregon. The directed commercial, incidental sablefish and salmon troll fisheries (if retaining halibut) must comply with closed areas. For these reasons, impacts to the physical environment are minimal.

For the reasons stated above, no substantial difference between the effects of the three alternatives on the physical environment would be expected. Based on the TAC and the anticipated level of fishing effort, Alternative 1 has the greatest level of potential impacts to the physical environment followed closely by Alternative 2, and then Alternative 3. However, impacts to the physical environment would be minimal under all of the alternatives.

4.2 Impacts to the Biological Environment

Effects of the Alternatives on the Halibut Population within Area 2A

Under each of the alternatives, the primary impact is on the overall amount of removals of halibut. Figure 8 shows the potential impact of the alternatives catch limits in terms of stock status and fishery yield. Figure 8 is drawn from IPHC documentation and is coastwide.

Of particular note, even under Alternative 3 (IPHC interim management procedure), the best available scientific information suggests that over the foreseeable future (2018 – 2021) the halibut resource is at risk of decline. The 2018 stock assessment provides additional detail on the potential trends in the halibut stock, uncertainties in the assessment, and additional factors that may impact the overall stock status and harvestable surplus of abundance of halibut (IPHC 2018c).

Figure 8. Decision table of Coastwide 2018 yield alternatives (columns) and risk metrics (rows). Values in the table represent the probability, in “times out of 100” of a particular risk (Source: IPHC 2018, Ian Stewart, Feb. 19, 2018).

2018 Alternative			No removals	Alt. 3: Reference SPR=46%	Alt. 2: Suggested Catch Limits	Alt. 1: Status quo, 2017 Catch limits
Total removals (M lb)			0.0	32.8	39.0	42.6
TCEY (M lb)			0.0	31.0	37.2	40.8
Fishing intensity			F _{100%}	F _{46%}	F _{41%}	F _{38%}
Fishing intensity interval			--	34-64%	30-60%	27-57%

Stock Trend (spawning biomass)	in 2019	is less than 2018	1	78	93	>99
		is 5% less than 2018	<1	5	19	34
	in 2020	is less than 2018	<1	67	88	98
		is 5% less than 2018	<1	21	48	68
	in 2021	is less than 2018	<1	76	92	99
		is 5% less than 2018	<1	46	72	89
Stock Status (Spawning biomass)	in 2019	is less than 30%	3	7	8	9
		is less than 20%	<1	<1	<1	<1
	in 2020	is less than 30%	2	7	10	13
		is less than 20%	<1	<1	<1	<1
	in 2021	is less than 30%	1	10	17	23
		is less than 20%	<1	<1	<1	1
Fishery Trend (TCEY)	in 2019	is less than 2018	<1	55	73	80
		is 10% less than 2018	<1	38	63	76
	in 2020	is less than 2018	<1	59	75	81
		is 10% less than 2018	<1	45	67	77
	in 2021	is less than 2018	<1	63	76	83
		is 10% less than 2018	<1	52	70	78
Fishery Status (Fishing intensity)	in 2018	is above F _{46%}	0	50	72	80

Figure 8 shows that based on the best available scientific information from the IPHC, the spawning biomass and the harvestable yield of halibut are at risk of decline under status quo (Alternative 1) catch limits and assuming that all other sources of removals also remain at status quo (i.e., the same as 2017). The potential risk of reduced spawning biomass and fishery yield decreases in future years under Alternatives 2 and 3. The decision table provides estimates of the fishing intensity rate associated with alternative harvest levels and the risk of decline with each alternative. The block of rows entitled “Stock Trend” evaluates the risks to short-term trend in spawning biomass, independent of all harvest policy calculations. The “Stock Status” rows show risks relative to the spawning biomass reference points and fishery performance is identified in the “Fishery Trend” rows. The specific catch limits and decision tables associated with the three alternatives are shown in Figure 8.

This action is limited to setting catch limits for only one year (2018) in Area 2A. Area 2A accounts for 2 percent of the coast wide Pacific halibut stock. The annual process used by the IPHC will recommend catch limits in future years, taking into account the status of the stock. This action is limited in scope, duration, and intensity. All three alternatives have a less than 10 percent chance of dropping below the threshold reference point of SB_{30} in 2019 and therefore the risk of decline under all alternatives is not expected to be significant.

Alternative 1

Under Alternative 1, the catch limits would be expected to result in fishery harvest rate of $F_{38\%}$ on a coastwide basis. Alternative 1 would be expected to substantially increase the risk of declines in spawning stock biomass and fishery yield over the foreseeable future, relative to Alternatives 2 and 3. As shown in Figure 8, Alternative 1 would nearly double the risk that the spawning stock biomass will decline by at least 5 percent in 2019 (34%), compared to Alternatives 2 (19%), and Alternative 3 (5%).

Alternative 1 would be expected to increase the probability that catch limits will continue to decline in future years relative to Alternatives 2 and 3. As shown in Figure 8, under Alternative 1, there is 76 percent chance that the fishery yield (effectively catch limits) will be more than 10 percent lower in 2019, compared to Alternative 2 (63%), and Alternative 3 (38%). This same pattern holds for 2020 and 2021.

Alternative 1 would also result in harvests that are greater than the best available information on the estimated biological abundance relative to Alternatives 2 and 3. As noted in Section 3.2, IPHC 2018b, and IPHC 2018c, the IPHC has distributed catch limits among Areas based on the distribution of O26 (over 26” fish) as estimated through survey and other data. Generally, the IPHC and NMFS have relied on these methods to help reduce the risk that harvests in a specific Area could cause localized depletion of that resource. Alternative 1 uses the estimated biological abundance in various Areas for 2017 rather than the most recent and best available IPHC estimates that are used in Alternatives 2 and 3.

Alternative 2

Under Alternative 2, catch limits would be expected to decrease the risk of declines in spawning stock biomass, and fishery yield over the foreseeable future relative to Alternative 1, but would increase the risk of declines in spawning stock biomass, and fishery yield over the foreseeable

future relative to Alternative 3. As shown in Figure 8, Alternative 2 would result in a 19% chance that the spawning stock biomass will decline by at least 5 percent in 2019, compared to a 34% chance under Alternative 1, and a 5% chance under Alternative 3. Compared to the most conservative alternative (Alternative 3), the catch limits under Alternative 2 would increase the risk that the stock could be less than threshold levels adopted by the IPHC that restrict catch limits if the spawning biomass declines below a specific level. However, this risk would be less under Alternative 2 as compared to Alternative 1.

Alternative 2 would be expected to increase the probability that catch limits will continue to decline in future years relative to Alternative 3. As shown in Figure 8, under Alternative 2, there is 63 percent chance that the fishery yield (effectively catch limits) will be more than 10 percent lower in 2019, compared to Alternative 1 (76%), and Alternative 3 (38%). This same pattern holds for 2020 and 2021.

Alternative 2 would also result in harvests in specific Areas that are more proportionate to the best available information on the estimated biological abundance in Area 2A relative to Alternative 1. Alternative 2 would effectively reduce harvests in Area 2A so that the resulting catch limits are between the 2017 TCEY and a TCEY of 1.06 million pounds.

Alternative 3

Under Alternative 3, the IPHC's interim management procedure seeks to maintain the total mortality of halibut across its range from all sources based on a reference level of fishing intensity so that the Spawning Potential Ratio (SPR) is equal to 46%. An $F_{46\%}$ SPR is a reference point that seeks to allow a level of fishing intensity that is expected to result in approximately 46% of the spawning stock biomass to remain compared to an unfished stock (i.e., no fishing mortality). Lower values indicate higher fishing intensity. Under this Alternative, a TCEY of 0.59 million pounds results in a catch limit of 0.47 million pounds in Area 2A.

Figure 8 summarizes the impact of Alternative 3. Overall, the stock biomass and total spawning biomass (the term Total Constant Exploitation Yield – TCEY is used in the IPHC process) would be expected to decline in 2019, 2020, and 2021, the probability and amount of this decline would be expected to be less under Alternative 3 relative to Alternatives 2 and 3. A detailed description of the IPHC stock assessment process is provided in documents produced by the IPHC (IPHC 2018c, IPHC 2018a).

Alternative 3 would be expected to decrease the risk of declines in spawning stock biomass, and fishery yield over the foreseeable future relative to Alternatives 1 and 2. As shown in Figure 8, Alternative 3 would result in only a 5% chance that the spawning stock biomass will decline by at least 5 percent in 2019, compared to a 34% chance under Alternative 1, and a 19% chance under Alternative 3. Alternative 3 represents the most conservative alternative, and would pose the lowest risk that the stock could be less than specific threshold levels adopted by the IPHC that restrict catch limits if the spawning biomass declines below a specific level.

Alternative 3 would be expected to decrease the probability that catch limits will continue to decline in future years relative to Alternatives 1 and 2. As shown in Figure 8, under Alternative 3, there is a 38 percent that the fishery yield (effectively catch limits) will be more than 10

percent lower in 2019, compared to Alternative 1 (76%), and Alternative 2 (63%). This same pattern holds for 2020 and 2021.

Effects of the Alternatives on Groundfish and Salmon

None of the alternatives are expected to have much, if any, difference in effects on groundfish and salmon species, because in addition to complying with closed areas, bycatch of these species in halibut fisheries is managed consistent with the groundfish and salmon FMPs, rebuilding plans for the overfished species, and the species-specific Annual Catch Limit (ACL). Therefore, while the number of fishing days for the halibut fishery may change under different allocation amounts, any impacts (bycatch) on groundfish or salmon would be taken into account through the respective management process and would be within the parameters of the applicable rebuilding plans and ACLs for the species impacted.

Effects of the Alternatives on Threatened and Endangered Species

Sea turtles, eulachon, marine mammals

Green sea turtles, loggerhead sea turtles, and olive ridley sea turtles are unlikely to occur in the Area 2A and therefore are not likely to be encountered by halibut fishing. In the eastern North Pacific, green sea turtles commonly occur off the southwest coast of the U.S., which is further south than halibut fisheries generally operate. Recreational fishing for halibut operates as far south as northern California, the commercial fishery operates mainly in Oregon, and tribal commercial fisheries operate only in Washington. Leatherback sea turtles occur north of central California during the summer and fall, but there are no records of interactions with halibut fisheries.

While eulachon are found in areas where halibut fishing occurs, they are primarily impacted by trawl gear which is not a gear used in any halibut fisheries along the coast and no bycatch of eulachon has been reported in the halibut fisheries, therefore no impacts are anticipated to eulachon from halibut fisheries.

No interactions between vessels operating and marine mammals in the directed commercial, tribal, or recreational fishery have been reported. Because the directed commercial fishery uses longline gear with which there are no records of marine mammal interaction and would have a limited fishing season (days) under any of the alternatives, no effects are expected to marine mammals. Based on bycatch records, there are no documented interactions of marine mammals or sea turtles with vessels or gear from the halibut fishery.

In summary, none of the alternatives is expected to have any measurable effect on listed marine mammals, eulachon, or sea turtles because the vessel traffic, fishing effort, gear presence, and schedule of the halibut fishery is anticipated to continue under any alternative similarly to past levels over the broad expanse of the West Coast and inland waters of Washington.

Green sturgeon

Uncertainty exists regarding the number of green sturgeon captured in the Pacific halibut fisheries in the past because consistent methods of monitoring green sturgeon catch have not

been implemented in most of the fisheries. Bycatch monitoring for green sturgeon has varied by fishery sector and area, but has been the most consistent in the recreational fisheries. The available data show occasional encounters of one to three green sturgeon a year, with no green sturgeon encounters in most years (NMFS 2018). All of the documented encounters were in the recreational fishery. We do not know if the lack of recorded green sturgeon encounters in the tribal fisheries and non-treaty directed commercial fishery is because of a lack of encounters or a lack of consistent monitoring for green sturgeon encounters. However, based on the gear types used in the fisheries (e.g., longline, troll, hook-and-line), the limited spatial overlap with green sturgeon, and the limited fishing seasons, we would expect bycatch of green sturgeon encounters in these fisheries to be similar to or less than what has been recorded for the recreational fisheries. As Alternative 1 is the 2017 status quo TAC, impacts to green sturgeon under Alternative 1 would be expected to be the same as these past levels.

Under Alternative 2, the lower TAC levels would result in slightly fewer fishing days. Lower allocations could allow halibut anglers to achieve their halibut quota at a faster rate. If the halibut quota is attained at a faster rate, anglers may spend less time operating in waters where green sturgeon occur and are vulnerable to incidental catch in the halibut fishery. Thus, there may be some slight reduction in incidental green sturgeon catch at the lower end of the range under Alternative 2. A more modest reduction in potential interaction with green sturgeon in the halibut fishery would occur under Alternative 3 when compared to Alternative 1 and Alternative 2.

Puget Sound rockfish

The sport and tribal fisheries in Puget Sound impact Puget Sound yelloweye and bocaccio rockfish. The recreational and non-treaty directed commercial fisheries on the coast will not have an effect on these species because they do not operate in the area where these species reside and therefore, interactions between these species and any fisheries operating on the coast is unlikely.

Halibut recreational fishing uses gear and bait that catch yelloweye and bocaccio. Historically, many anglers would target halibut and rockfish at the same time, however, current regulations prohibit retention of yelloweye and bocaccio rockfish in Puget Sound. Even though retention is not allowed some unintentional catch may occur. Descending devices are required in Washington and Oregon to release rockfish at depth to enhance survival when caught incidentally.

There has been little systematic bycatch data recording in the tribal halibut fisheries. However, given the fishing gear, timing, and areas fished it is anticipated that these species may be encountered by the tribal fishery in Puget Sound. Yelloweye rockfish are primarily associated with the bottom, which makes them susceptible to longline baits compared to some other rockfish species, such as bocaccio. Bocaccio are semi-pelagic rockfish, meaning they can spend time suspended in the water column and also move long distances. These factors likely make them less susceptible to longline baits that are deployed at or very near the bottom.

As Alternative 1 is the 2017 status quo TAC, impacts to Puget Sound rockfish under Alternative 1 would be expected to be the same as these past levels, estimated between 18 to 40 bocaccio and between 134 to 270 yelloweye rockfish (NMFS 2018). Under Alternative 2, the lower TAC would likely result in slightly fewer fishing days compared to Alternative 1. Lower allocations

could allow halibut anglers to achieve their halibut quota at a faster rate. If the halibut quota is attained at a faster rate, anglers may spend less time operating in waters where ESA-listed groundfish species are vulnerable to incidental catch in the halibut fishery. Thus, there may be some modest reduction in incidental yelloweye rockfish catch under Alternative 2 compared to Alternative 1. A more modest reduction in potential interaction with Puget Sound rockfish in the halibut fishery would occur under Alternative 3 when compared to Alternative 1 and Alternative 2.

Salmon

As detailed in the NMFS Biological Opinion (NMFS 2018) commercial halibut bottom longline gear rarely, if ever, catches salmonids; the annual setline survey has no documented catches of salmon. Only the recreational halibut fishery impacts ESA-listed salmon and the magnitude of the impact is minimal, estimated between one to two ESA-listed salmon per year (NMFS 2018), thus Pacific halibut fisheries pose low risk to ESA-listed salmon stocks. Only zero to five salmon are caught incidental to the recreational halibut fishery when salmon are not targeted. Therefore, none of the alternatives are expected to have any measurable effects on threatened or endangered salmon stocks. The tribal fishery reported no catch of Chinook salmon.

The salmon troll fishery has an allocation for incidental harvest of halibut that is anticipated to continue under all alternatives and any impacts to listed salmon species from that fishery are covered under the Biological Opinions for the salmon fishery (NMFS 2015, 2012, 2010). The allocation of halibut to the salmon troll fishery does not have an effect on any salmon stocks because changes in the allocation of halibut to this fishery do not affect fishing effort for salmon, only the amount of incidental halibut that may be retained. Any listed salmon that are caught in the salmon troll fishery are managed through the Council's salmon management process and would not be affected by the TAC Alternatives.

Seabirds

The commercial and tribal halibut fisheries in the proposed action use longline gear, the gear type with the highest potential interaction with seabirds, particularly the ESA-listed short-tailed albatross. However, the proposed action is much smaller in magnitude and duration than other longline fisheries that have experienced short-tailed albatross mortality, such as the Pacific groundfish fishery. Halibut gear is much less likely to hook albatrosses because it is a shorter line and sinks very quickly, and therefore, albatross exposure to hooks is low. To date, there have been no seabird interactions reported in the Area 2A halibut fishery. Although it is possible that baited hooks could attract short-tailed albatross, interactions are not reasonably certain to occur over the course of action due to the nature of the gear and the annual duration of the fishery. The deeper fishing depth and further distance from shore in the halibut fishery and seabird interactions are unlikely to occur.

Under all alternatives, impacts to seabirds are most likely very low. As Alternative 1 is the 2017 status quo TAC, impacts to seabirds under Alternative 1 would be expected to be the same as last year. Under Alternative 2, the lower TAC would likely result in slightly fewer fishing days compared to Alternative 1. Lower allocations could allow halibut anglers to achieve their halibut quota at a faster rate. If the halibut quota is attained at a faster rate, anglers may spend less time operating in waters where seabird species are vulnerable to incidental catch in the halibut fishery.

Thus, there may be some modest reduction in seabird interaction under Alternative 2 compared to Alternative 1. A reduction in potential interaction with seabirds in the halibut fishery would likely occur under Alternative 3 when compared to Alternative 1 and Alternative 2.

4.3 Impacts to the Socio-Economic Environment

Effects on Fishery Participant Harvest and Income Opportunities

In 2017, 574 vessels were issued IPHC licenses to retain halibut in Area 2A. IPHC issues licenses for the directed commercial fishery in Area 2A (192 licenses in 2017), the incidental fishery in the sablefish primary fishery in Area 2A (8 licenses in 2017), incidental halibut caught in the salmon troll fishery (222 licenses in 2017), and the charterboat fleet (136 licenses in 2017). A number of vessels were issued IPHC licenses for both: the 2A directed commercial fishery and the incidental fishery in the sablefish primary fishery (16 licenses in 2017).

These license estimates overstate the number of vessels that participate in the non-tribal fisheries. IPHC estimates that only half of the licensed vessels participated in the directed commercial fishery, 100 vessels in the incidental commercial (salmon) fishery, and 13 vessels in the incidental commercial (sablefish) fishery. Recent information on charterboat activity is not available, prior analysis indicated that 60 percent of the IPHC charterboat license holders may be affected.

Alternative 1 would continue the catch limits that were in place during 2017. A similar number of licenses to 2017 would be expected to be issued under Alternative 1. Therefore, Alternative 1 would have negligible change in effects on fishery participant harvest or income opportunities.

Under Alternative 2, the impact to harvest and income opportunities comes from changes to the TAC. TAC under Alternative 2 would be less than Alternative 1 and would provide fewer harvest and income opportunities, proportional to the 11 percent reduction in TAC (Figure 2). This reduction is not significant given the context of the overall fishery and coastal communities and the limited duration of the proposed reduction addressed in this EA.

Given the 65 percent decrease in catch limits from Alternative 1, Alternative 3 would have substantial negative impacts on harvest and income opportunities in the Area 2A fishery, as seen in Figure 2. With a TAC of 0.47 million pounds for halibut, retention of halibut caught incidentally in the sablefish fishery would not be allowed. The commercial incidental salmon fishery would be allowed to retain 14,068 pounds of halibut, around half of the 10 year average for incidental retention. The directed commercial halibut fishery landed around 160,000 pounds over two days of fishing in 2017. Under Alternative 3, there would be a quota of only 79,720 pounds, that would likely amount to one fishing day. The Washington recreational fishery has the most effort out of the recreational fisheries in Area 2A, and would be most affected by Alternative 3. The first two days the fishery was open, 94,516 pounds of halibut were landed in Washington in 2017. Under Alternative 3, the entire Washington recreational allocation would be 108,758 pounds for the season. Sport fishing is important to the economies of coastal communities, and having only 1 to 2 fishing days (compared to the 5 to 9 days) in the Puget Sound, North and South Coast subareas would impact livelihoods of those reliant on recreational

fisheries. Overall, Alternative 3 would have substantial negative impacts on the socio-economic environment.

4.4 Cumulative Effects

A cumulative effects analysis is required by the Council on Environmental Quality (CEQ) (40 C.F.R. Part 1508.7). The purpose of a cumulative effects analysis is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful. A formal cumulative impact assessment is not necessarily required as part of an EA under NEPA as long as the significance of cumulative impacts has been considered. The following addresses the significance of the expected cumulative impacts as they relate to the halibut fishery.

Geographical and Temporal Boundaries

The analysis of impacts discussed in Section 4 focuses on catch limits in Area 2A. The cumulative assessment of Pacific halibut includes Area 2A and the range of the stock managed by the IPHC along the west coast and Alaska. For socioeconomic issues, the core geographic boundaries are defined as those fishing communities directly involved in the harvest or processing of the managed resources that occur in Washington, Oregon, and California.

The temporal scope of past and present actions for the potentially affected resources is focused on actions that have occurred after the implementation of the Plan in 1995. The temporal scope of future actions for all affected resources extends through 2018. While this analysis notes that catch limits established in 2018 could have longer term impacts on the halibut resources over the reasonably foreseeable future (until 2021 based on the best available information from IPHC scientists—*see* IPHC 2018a, IPHC 2018c), the alternatives considered under this action are intended to be limited to one year. Under the provisions of the Convention and Halibut Act, the IPHC has a specific authority to recommend catch limits for 2019 and future years. Therefore, this analysis assumes that the impact of this action is limited to only the effects of modifying catch limits for 2018, and that the annual process used by the IPHC to recommend catch limits for adoption by the U.S. and Canada will be used in future years. This EA would be supplemented if there are substantial changes to the proposed action that are relevant to environmental concerns, or there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

Past, Present, and Reasonably Foreseeable Future Actions

Fishery-related Actions

The IPHC conducts an annual stock assessment survey to assess the health of the halibut stock in all its regulatory areas. This survey provides the IPHC with the necessary information to conduct stock assessments and aid in the sustainable management of halibut along the coast from California to Alaska. It is anticipated that this survey will continue.

Of the past, present, and reasonably foreseeable future actions that are expected to also affect Area 2A, the most notable is any action that would substantially change the allocations or the

Plan. There is an annual review of the Plan by Washington, Oregon, California, and tribal managers. Minor changes to the Plan have occurred each year since the Plan was implemented in 1995 to respond to the needs of the fisheries. This review and implementation process is anticipated to continue into the foreseeable future. NMFS, in coordination with the Council, has proposed minor changes to the Plan for 2018. The changes to the Plan for 2018 are expected to have negligible impact on Pacific halibut and the other affected resources.

The status of the Pacific halibut stock is managed by the IPHC on a coastwide basis. The annual stock assessment incorporates the fishery-independent setline survey with several models to establish the risk associated with various coastwide TCEYs. The IPHC estimates the distribution of the coastwide stock based on survey catch rate among Areas using information from its annual setline survey. The coastwide TCEY is evaluated according to the risk of decline in the spawning stock biomass and fishery yield over the foreseeable future, and the probability that the catch limits will continue to decline in future years. For this reason, the stock assessment only analyzes what is sustainable on a coastwide level. The Pacific halibut fisheries in Alaska and British Columbia, Canada, are allocated around 98 percent of the coastwide halibut stock. In context, decisions made on catch limits for 2A have a minimal effect on the status of Pacific halibut in the context of the entire halibut resource. Alaska and British Columbia and are anticipated to set their own catch limits for 2018. While, the status of stock coastwide indicates several years of low recruitment and lower size-at-age than in previous years, actions setting 2018 catch limits across the Pacific halibut fishery are expected to set levels which will permit the optimum yield from the fishery, and maintain the stocks at those levels.

An action to implement Pacific Coast groundfish fishery management measures occurs every other year. Although halibut is not included in the Pacific Coast groundfish complex for management purposes, it has a life history similar to other large flatfish managed within this complex and is caught as bycatch in commercial and recreational groundfish fisheries. Fishing for halibut, both commercial and recreational, occurs in the same waters and effects the same habitats as fishing for Pacific Coast groundfish. The effects of the 2017-2018 groundfish specifications and management measures have been described and analyzed in an Environmental Assessment (NMFS 2016). Other groundfish fishery actions, including the proposed changes to Trawl Gear and Essential Fish Habitat Conservation Areas / Rockfish Conservation Areas (EFH/RCA) are not scheduled to occur in 2018. Actions considered in this EA on Pacific halibut management are not expected to have effects on the environment that, when considered in combination with groundfish specifications and management measures, measurably alter the effects.

The Council and NMFS continue to work together on various actions. These actions are not expected to appreciably interact within the temporal scope of the proposed action.

Non-fishing Actions

Non-fishing activities that introduce chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment pose a risk to all of the identified affected resources. Human-induced non-fishing activities tend to be localized

in nearshore areas and marine project areas where they occur. Examples of these activities include, but are not limited to, agriculture, port maintenance, coastal development, marine transportation, marine mining, dredging, and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these species to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities. The overall impact to the affected species and their habitats on a population level is unknown, but likely neutral to low negative, since a large portion of these species have a limited or minor exposure to these local non-fishing perturbations.

NMFS reviews these types of effects through the review processes required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, for certain activities that are regulated by Federal, state, and local authorities. The jurisdiction of these activities is in "waters of the U.S." and includes both river and marine habitats.

For many of the proposed non-fishing activities to be permitted under other Federal agencies (such as offshore energy facilities, etc.), those agencies would conduct examinations of potential impacts on the affected resources. While the Magnuson-Stevens Act (50 CFR 600.930) does not have jurisdiction over the halibut fishery, it does impose an obligation for other Federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH. The Pacific Fishery Management Council is engaged in this review process by making comments and recommendations on any Federal or state action that may affect habitat, including EFH, for their managed species and by commenting on actions likely to substantially affect habitat, including EFH.

In addition, under the Fish and Wildlife Coordination Act (Section 662), "whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the U.S., or by any public or private agency under Federal permit or license, such department or agency first shall consult with the U.S. Fish and Wildlife Service (USFWS), Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular state wherein the" activity is taking place. This act provides another avenue for review of actions by other Federal and state agencies that may impact resources that NMFS manages in the reasonably foreseeable future. In addition, NMFS and the USFWS share responsibility for implementing the ESA. ESA requires NMFS to designate "critical habitat" for any species it lists under the ESA (i.e., areas that contain physical or biological features essential to conservation, which may require special management considerations or protection) and to develop and implement recovery plans for threatened and endangered species. The ESA provides another avenue for NMFS to review actions by other entities that may impact endangered and protected resources whose management units are under NMFS' jurisdiction.

The effects of climate on the biota of the California Current ecosystem have been recognized for some time. The El Niño/Southern Oscillation (ENSO) is widely recognized to be the dominant mode of interannual variability in the equatorial Pacific, with impacts throughout the rest of the Pacific basin and the globe. During the negative (El Niño) phase of the ENSO cycle, jet stream winds are typically diverted northward, often resulting in increased exposure of the west coast of the U.S. to subtropical weather systems. The impacts of these events to the coastal ocean generally include reduced upwelling winds, deepening of the thermocline, intrusion of offshore (subtropical) waters, dramatic declines in primary and secondary production, poor recruitment, reduced growth and survival of many resident species (such as salmon and groundfish), and northward extensions in the range of many tropical species. Concurrently, top predators such as seabirds and pinnipeds often exhibit reproductive failure. In addition to interannual variability in ocean conditions, the North Pacific seems to exhibit substantial interdecadal variability, which is referred to as the Pacific (inter) Decadal Oscillation (PDO).

Within the California Current itself, Mendelssohn, et al. (2003) described long-term warming trends in the upper 50 to 75 m of the water column. Recent paleoecological studies from marine sediments have indicated that the 20th century warming trend in the California Current has exceeded natural variability in ocean temperatures over the last 1,400 years. Statistical analyses of past climate data have improved our understanding of how climate has affected North Pacific ecosystems and associated marine species productivities. Our ability to predict future impacts on the ecosystem stemming from climate forcing events remains poor at best.

Climatic shifts, like the short-term El Niños and La Niñas or long-term Pacific Decadal Oscillation may affect the California Current ecosystem through amounts of upwelling and thus shifts in the trophic cascade. This shifting interdependence affects higher order species, like Pacific halibut, in different ways at different life stages. In other words, some climate conditions may be beneficial to the survival of larvae of a particular species but may have no effect on an adult of that same species. Population data on Pacific halibut seems to show a link between climate and recruitment. Climatic regimes and weather strongly influence Pacific halibut recruitment in the year of spawning, with recruitment tending to be higher during positive PDO events (Clark and Hare, 2002.)

Summary of the Cumulative Effects of the Alternatives

Physical environment

No alternative detailed in this EA is expected to have notable or measurable effects on the physical environment. The proposed action in this document would not change the past and anticipated cumulative effects on the physical environment and thus, would not have any significant effect on the physical environment individually or in conjunction with other anthropogenic activities.

Biological environment

Pacific halibut

An Area 2A catch limit between the lowest value of 0.47 million pounds to the highest of 1.47 million pounds is unlikely to cause a conservation concern to the coastwide status of Pacific halibut, as the Area 2A quota is 2 percent of the coastwide quota. However, the connectivity of halibut in Area 2A compared to other regions is not well understood and the potential risk of localized depletion in Area 2A is a factor in setting appropriate catch limits. Past fishery management actions taken through the Council and IPHC processes have had an overall positive effect on Pacific halibut. It is anticipated that the future management actions will result in additional indirect positive effects on the managed resource through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services on which halibut productivity depends. Catch limits across the Pacific halibut fishery are expected to be set at levels which will permit the optimum yield from the fishery, and maintain the stocks at those levels. NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on halibut. Based on the information and analyses presented in this document, when this proposed action is considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, it is not expected to result in any significant cumulative impacts to the Pacific halibut resource.

Groundfish and salmon

None of the alternatives are expected to have much, if any, difference in effects on groundfish and salmon species, because in addition to complying with closed areas, bycatch of these species in halibut fisheries is managed consistent with the groundfish and salmon FMPs, rebuilding plans for the overfished species, and the species-specific Annual Catch Limit (ACL). Therefore, while the number of fishing days for the halibut fishery may change under different allocation amounts, any impacts (bycatch) on groundfish or salmon would be taken into account through the respective management process and would be within the parameters of the applicable rebuilding plans and ACLs for the species impacted. The proposed action in this document would not change the past and anticipated cumulative effects on the salmon and groundfish and thus, would not have any significant effect on salmon and groundfish individually or in conjunction with other anthropogenic activities.

Threatened and endangered species

The proposed action would have low negative effects on listed salmon, Puget Sound bocaccio and yelloweye rockfish, and green sturgeon because although these species are caught as bycatch in the halibut fishery, the impacts are low because the bycatch of these species is expected to be minor compared to the overall population levels. For the remaining listed species in the action area, proposed action would have negligible effects on marine mammals, sea turtles, eulachon because these species rarely interact with halibut fisheries and this is unlikely to change because the gear, areas, and timing are not anticipated to change.

The proposed action would have negligible effects on seabirds because no seabird interactions have been reported in the halibut fishery and this alternative would not alter the gear used, structure, or timing of the fishery because the gear, areas, and timing are not anticipated to change.

Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to protected resources have had a positive effect on threatened and endangered species. Non-fishing activities that introduce chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment pose a risk to these species. The proposed action in this document would not change the past and anticipated cumulative effects on threatened and endangered species and thus, would not have any significant effect on protected resources individually or in conjunction with other anthropogenic activities.

Socioeconomics

The primary socioeconomic issue for the halibut fishery is changes in the annual TAC. Alternative 1 would continue the catch limits which were in place during 2017 and would have negligible effects on fishery participant harvest or income opportunities. The TAC under Alternative 2 would be 11 percent less than Alternative 1 and would provide fewer harvest and income opportunities. Alternative 3 would have substantial impacts on harvest and income opportunities in the Area 2A fishery compared to Alternative 1 and Alternative 2.

Despite the potential for negative short-term effects on socioeconomics from the preferred alternative, the expectation is that there would be a positive long-term effect if catch limits, for Pacific halibut are specified to ensure the stock is managed to levels which will permit the optimum yield from the fishery, and maintain the stocks at those levels. Overall, the proposed action in this document would not change the past and anticipated cumulative effects on socioeconomics and thus, would not have any significant effect on the socio-economic environment individually, or in conjunction with other anthropogenic activities.

Figure 9. Magnitude and significance of the cumulative effects

Resource	Status in 2018	Net Impact of Past, Present, and Reasonably Foreseeable Future Actions	Impact of the Preferred Alternative	Significant Cumulative Effects
Physical Environment	Complex and Variable (Section 3.1)	Positive (Section 4.4)	Negligible (Section 4.1)	None
Pacific Halibut	Complex and Variable (Section 3.2)	Positive (Section 4.4)	Negligible (Section 4.2)	None
Groundfish and Salmon	Complex and Variable (Section 3.2)	Positive (Section 4.4)	Negligible (Section 4.2)	None

Threatened and endangered species	Complex and Variable (Section 3.2)	Positive (Section 4.4)	Negligible to low negative (Section 4.2)	None
Socioeconomic Environment	Complex and Variable (Section 3.3)	Positive (Section 4.4)	Low negative (Section 4.3)	None

Overall, when this proposed action is considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative. Based on the information and analyses presented in this document, there are no significant cumulative effects associated with the proposed action.

5.0 FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Selected Alternative:

NMFS selected Alternative 2. Alternative 2 would follow the Total Constant Exploitation Yield (TCEY) of 1.32 million pounds and resulting Area 2A Total Allowable Catch (TAC) of 1.19 million pounds for Pacific halibut.

Related Consultations:

Section 3.2.3 of the EA describes the Endangered Species Act consultations related to the proposed action.

Significance Review

The Council on Environmental Quality (CEQ) Regulations state that the determination of significance using an analysis of effects requires examination of both context and intensity, and lists ten criteria for intensity (40 CFR 1508.27). In addition, the Companion Manual for National Oceanic and Atmospheric Administration Administrative Order 216-6A provides sixteen criteria, the same ten as the CEQ Regulations and six additional, for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to the proposed action and considered individually as well as in combination with the others.

1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?

The impacts of the proposed action on the biological, physical, and human components of the environment are described in section 4.0 of the EA. The proposed action is not expected to increase fishing effort or alter the spatial and/or temporal distribution of current fishing effort. The proposed action is not reasonably expected to cause beneficial or adverse impacts that result in a significant effect overall.

2. Can the proposed action reasonably be expected to significantly affect public health or safety?

The proposed action would have no impact on public health or safety. This action merely sets the catch limit for the 2018 Pacific halibut fishery in Area 2A. None of the evaluated alternatives are expected to alter fishing methods or activities. None of the evaluated alternatives are expected to significantly increase fishing effort or the spatial and/or temporal distribution of current fishing effort.

3. Can the proposed action reasonably be expected to result in significant impacts to unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?

The proposed action would be located in the marine environment and does not involve any new construction. Therefore, it is unlikely to adversely affect historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

4. Are the proposed action's effects on the quality of the human environment likely to be highly controversial?

The effects on the human environment from this action are not expected to be highly controversial. The impacts of the proposed measures on the human environment are described in section 4.0 of the EA. This action sets catch limit for the 2018 Pacific halibut fishery in Area 2A. The scientific information upon which the catch limit is based has been reviewed by NMFS scientists and a scientific review panel convened by but independent of the IPHC and is the most recent information available. While tribes have expressed some disagreement with the data, NMFS believes it is relying on the best available scientific information. As such, the measures contained in this action are not expected to be highly controversial.

5. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Alternatives 1 and 2 fall into a range of TACs that have been implemented in previous years. Alternative 3 is much lower than the lowest TAC implemented in the last 14 years, which was 810,000 pounds. While a low TAC, such as Alternative 3, has never

been implemented, the environmental and economic effects are not uncertain and can be estimated based on lower TACs from previous years.

The effects on the human environment from the proposed action are neither unique nor unknown. There were no uncertain effects or unique or unknown risks identified during the development of alternatives for the proposed action, nor did any surface during preparation of the required environmental documentation (see section 4.0).

6. Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

The proposed action is not likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration. Under the Northern Pacific Halibut Act 1982 (16 U.S.C. §§ 773–773k), the Secretary of Commerce has the authority to adopt regulations, such as catch limits in Area 2A, that are necessary to carry out the purposes and objectives of the Convention and the Halibut Act. *See also* Convention Article I, PAR 2 (“[I]t is understood that nothing contained in this Convention shall prohibit either Party from establishing additional regulations, applicable to its own nationals and fishing vessels, and to fishing vessels licensed by that Party, governing the taking of halibut which are more restrictive than those adopted by the International Pacific Halibut Commission.”). The proposed action does not represent a decision in principle about future Area 2A catch limits. NMFS anticipates the annual process used by the IPHC to recommend catch limits for adoption by the U.S. and Canada will be used in 2019 and future years.

7. Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?

The cumulative effects of the proposed action are detailed in section 4.4 of the EA. The proposed action is not expected to increase fishing effort or alter the spatial and/or temporal distribution of current fishing effort. The proposed action, when considered together with other related actions, will not have cumulatively significant impacts.

8. Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?

The impacts of the proposed measures on the human environment are described in section 4.0 of the EA. No impacts to districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places are expected to occur. Additionally, no impacts are expected that may cause loss or destruction of significant cultural, scientific, or historical resources.

9. Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?

The proposed action is not expected to significantly alter fishing methods or activities, or alter the spatial and/or temporal distribution of current fishing effort. This action is not expected to affect endangered or threatened species or critical habitat in any manner not considered in the consultations for the halibut fishery (NMFS 2017, NMFS 2018).

10. Can the proposed action reasonably be expected to threaten a violation of federal, state, or local law or requirements imposed for environmental protection?

The proposed action merely sets 2018 catch limit for Pacific halibut in Area 2A. The proposed action is not expected to alter fishing methods or activities such that they would threaten any federal, state, or local law or requirement for the protection of the environment.

11. Can the proposed action reasonably be expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act?

The proposed action is not expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act. Based on bycatch records, there are no documented interactions of marine mammals with vessels or gear from the halibut fishery. The effects of the proposed action on marine mammals are detailed in section 4.2 of the EA.

12. Can the proposed action reasonably be expected to adversely affect managed fish species?

The proposed action is not expected to adversely affect managed fish species. The proposed action would not jeopardize the sustainability of Pacific halibut. The catch limit is based on current stock assessment information. Area 2A is around 2 percent of the coastwide stock. While there is some uncertainty concerning how the status of Pacific halibut in area 2A influences the status of the coastwide stock (section 3.1.1.2), this action sets catch limit for a limited time period (2018) and is not expected to jeopardize the sustainability of coastwide Pacific halibut. This determination is supported by the information presented in section 4.2. The proposed action would not jeopardize the sustainability of any non-target species affected by the action because incidental catch of non-target species is regulated either through state and federal regulations for sport fisheries or through federal regulations for groundfish and salmon fisheries that incidentally take halibut. Yelloweye rockfish is an overfished species that is caught as bycatch in halibut fisheries. It is managed through the Council's groundfish process consistent with rebuilding plans that take into account any bycatch of yelloweye rockfish in halibut fisheries. Also, closed areas in both state and federal waters provide protection to habitat where yelloweye are most abundant. For salmon and sablefish

bycatch, regulations are in place to limit the incidental take of salmon and groundfish in halibut directed fisheries.

13. Can the proposed action reasonably be expected to adversely affect essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act?

The proposed action is not expected to adversely affect essential fish habitat because of the gear, limited geographic scope, and limited duration of the fisheries coupled with the closed areas already in use for both the recreational and commercial fisheries. The halibut fishery primarily uses longline gear. This gear does contact the seafloor but current measures limit the amount of time and the area that this gear is in contact with ocean and coastal habitats and essential fish habitat. Further, halibut fisheries must comply with the groundfish closed areas for both the recreational and commercial fisheries. These closed areas are designed to protect rockfish and their habitat. Washington, Oregon, and California also have areas within state waters that are closed to halibut fishing. Finally, the directed commercial and tribal fisheries are open only a few days per year resulting in limited gear contact with bottom habitat. Therefore, impacts to habitat from this gear have been minimized to the extent practicable.

14. Can the proposed action reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

The proposed action is not expected to adversely affect vulnerable marine or coastal ecosystems. Fishing for halibut is only permitted with hook-and-line gear. This action merely sets the catch limit for the 2018 Pacific halibut fishery in Area 2A. None of the evaluated alternatives are expected to alter fishing methods or activities. None of the evaluated alternatives are expected to significantly increase fishing effort or the spatial and/or temporal distribution of 2017 fishing effort.

15. Can the proposed action reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

The proposed action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. This action merely sets the catch limits for the 2018 Pacific halibut fishery in Area 2A. None of the catch-limit alternatives analyzed are expected to alter fishing methods or activities. None of these catch limits are expected to significantly increase fishing effort or the spatial and/or temporal distribution of current fishing effort.

16. Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

The proposed action is not expected to significantly alter fishing methods or alter the spatial and/or temporal distribution of current fishing effort. Activities under the proposed action will not involve the transport of non-indigenous species. The fishing

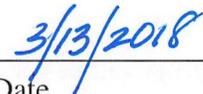
vessels participating in the proposed action would not increase the risk of introduction through ballast water or hull fouling. Disposition of the catch does not include any translocation of living marine resources, nor use of any nonindigenous species as bait.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for 2018 Pacific Halibut Catch Limit in International Pacific Halibut Commission Regulatory Area 2A (Washington, Oregon, and California), it is hereby determined that the 2018 Pacific Halibut Catch Limit in International Pacific Halibut Commission Regulatory Area 2A (Washington, Oregon, and California) will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an environmental impact statement for this action is not necessary.



Barry A. Thom
Regional Administrator
West Coast Region
National Marine Fisheries Service



Date

6.0 PACIFIC HALIBUT ACT CONSIDERATIONS

The fisheries for Pacific halibut are governed under the authority of the Northern Pacific Halibut Act of 1982 (Halibut Act, 16 U.S.C. §§ 773-773k). For the United States, the Halibut Act gives effect to the Convention between the United States and Canada for the Preservation of the Halibut Fishery of the North Pacific Ocean and Bering Sea. The Halibut Act also provides authority to the Regional Fishery Management Councils, as described in § 773c:

(c) Regional Fishery Management Council involvement

The Regional Fishery Management Council having authority for the geographic area concerned may develop regulations governing the United States portion of Convention waters, including limited access regulations, applicable to nationals or vessels of the United States, or both, which are in addition to, and not in conflict with regulations adopted by the International Pacific Halibut Commission. Such regulations shall only be implemented with the approval of the Secretary, shall not discriminate between residents of different States, and shall be consistent with the limited entry criteria set forth in section 1853(b)(6) of this title. If it becomes necessary to allocate or assign halibut fishing privileges among various United States fishermen, such allocation shall be fair and equitable to all such fishermen, based upon the rights and obligations in existing Federal law, reasonably calculated to promote conservation, and carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of the halibut fishing privileges.

This analysis considers the three alternative catch limits as described in section 2.0 and their impacts on the halibut resource and halibut fishery. Under the Halibut Act, the Secretary of Commerce has the authority to implement 2018 catch limits in Area 2A and management measures in the Plan that are necessary to carry out the purposes and objectives of the Convention. Adherent to the Halibut Act, this action does not discriminate by residents of different states. This action maintains current allocations as determined through the Plan, established through the Council (*i.e.*, tribal and non-tribal, commercial and recreational fisheries).

7.0 REGULATORY FLEXIBILITY ACT AND EO 12866 (Regulatory Impact Review)

The President of the United States signed E.O. 12866, “Regulatory Planning and Review,” on September 30, 1993. This order established guidelines for promulgating new regulations and reviewing existing regulations. The E.O. covers a variety of regulatory policy considerations and establishes procedural requirements for analysis of the benefits and costs of regulatory actions. The E.O. stresses that in deciding whether and how to regulate, agencies should assess all of the costs and benefits of available regulatory alternatives. Based on this analysis, they should choose those approaches that maximize net benefits to the Nation, unless a statute requires

another regulatory approach.

NMFS satisfies the requirements of E.O. 12866 through the preparation of an RIR. The RIR provides a review of the potential economic effects of a proposed regulatory action in order to gauge the net benefits to the Nation associated with the proposed action. The analysis also provides a review of the problem and policy objectives prompting the regulatory proposal and an evaluation of the available alternatives that could be used to solve the problem.

The RIR provides an assessment that can be used by the Office of Management and Budget to determine whether the proposed action could be considered a significant regulatory action under E.O. 12866. E.O. 12866 defines what qualifies as a “significant regulatory action” and requires agencies to provide analyses of the costs and benefits of such action and of potentially effective and reasonably feasible alternatives. An action may be considered significant if it is expected to: (1) Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; (2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) Raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in the EO.

Statement of the Problem

The action is needed to set 2018 catch limits for Pacific halibut in International Pacific Halibut Commission (IPHC) Regulatory Area 2A. At the IPHC’s annual meeting in January 2018, the U.S. and Canada did not reach agreement on catch limits and other regulations for the management of halibut fisheries in U.S. or Canadian waters in 2018. Under the provisions of the Convention, catch limits and regulations in place in 2017 will remain in effect until superseded by regulations implemented by the IPHC, or through domestic regulations implemented by Canada or the U.S. Biological information presented by IPHC scientists at the annual meeting indicate that the total biomass, and specifically the total spawning biomass, of halibut is projected to decline substantially over the next several years if catch limits are not reduced relative to 2017. Reductions in catch limits in IPHC Regulatory Area 2A are necessary for 2018 to better protect the declining halibut resource and enhance the conservation of Pacific halibut while taking into account the potential adverse socioeconomic impacts that may result from lower catch limits.

Description of the fishery and other affected entities

The Council, through the Catch Sharing Plan (Plan), allocates halibut among groups of fishermen in Area 2A, off the coasts of Washington, Oregon, and California. To implement the Plan, NMFS applies the Plan framework to the annual Area 2A TAC. For non-tribal fisheries, the Plan governs allocations of the TAC between components of the commercial and recreational fisheries, which vary annually depending on the amount of Pacific halibut TAC and thresholds in the Plan. Aspects of Area 2A’s directed commercial fishery are governed by the IPHC regulations rather than the domestic regulations under the Plan: the commercial fishery opening

date(s), duration, and vessel trip limits to ensure that the quota for the non-tribal commercial fisheries is not exceeded.

The Pacific halibut fisheries in Area 2A are allocated a small percentage, generally less than 2 percent, of the coast-wide TAC. Washington treaty Indian tribes are allocated 35 percent of the Area 2A TAC. The allocation to non-tribal fisheries is divided into four shares: a commercial fishery (30.7 percent) and recreational fisheries in Washington (35.6 percent), Oregon (29.7 percent), and California (4.0 percent). The Plan further subdivides the recreational fisheries into six geographic areas, each with separate allocations and seasons.

In 2017, 574 vessels were issued IPHC licenses to retain halibut. IPHC issues licenses for the directed commercial fishery in Area 2A (192 licenses in 2017), the incidental fishery in the sablefish primary fishery in Area 2A (8 licenses in 2017), incidental halibut caught in the salmon troll fishery (222 licenses in 2017), and the charterboat fleet (136 licenses in 2017). A number of vessels were issued IPHC licenses for both: the 2A directed commercial fishery and the incidental fishery in the sablefish primary fishery (16 licenses in 2017).

These license estimates overstate the number of vessels that participate in the fishery. IPHC estimates that only half of the licensed vessels participated in the directed commercial fishery, 100 vessels in the incidental commercial (salmon) fishery, and 13 vessels in the incidental commercial (sablefish) fishery. Recent information on charterboat activity is not available, prior analysis indicated that 60 percent of the IPHC charterboat license holders may be affected.

Description of the management goals and objectives

The federal governments of Canada and the United States (U.S.) adopt domestic regulations to manage the portions of the fishery in their respective waters. In the United States, the Northern Pacific Halibut Act of 1982 at [16 U.S.C. 773c](#) provides that the Secretary of Commerce (Secretary) shall have general responsibility to carry out the Halibut Convention between the U.S. and Canada and that the Secretary shall adopt such regulations as may be necessary to carry out the purposes and objectives of the Convention and the Halibut Act. The IPHC is responsible for drafting annual regulations, conducting the annual halibut survey, and producing stock assessments. The stock assessment produces a range of total allowable catch (TAC) amounts, which are presented to the U.S. and Canadian Commissioners, who in consultation with members of the public, decide on the final TAC for each management area. In some cases, the U.S. and Canada may set catch limits through domestic rulemaking processes that are more restrictive than those put forth by the IPHC.

Description of the Alternatives

Alternative 1 (No Action/Status Quo)

Alternative 1 would maintain the 2017 Total Constant Exploitation Yield (TCEY) of 1.47 million pounds and resulting Area 2A Total Allowable Catch (TAC) of 1.34 million pounds. 2017 Pacific halibut catch limits and regulations will remain in effect until superseded by regulations implemented by the IPHC (83 FR 10390), or through domestic regulations implemented by Canada or the U.S. *See* 2017 final rule for Area 2A (82 FR 18581). Setting the

2017 catch limit for 2018 in Area 2A was supported by the IPHC conference and processor advisory boards.

Alternative 2 (Preferred Alternative)

Alternative 2 would follow the TCEY of 1.32 million pounds and resulting Area 2A TAC of 1.19 million pounds. This alternative was suggested but not adopted by the U.S. Commissioners. The Commissioners determined a reduction in catch limits relative to 2017 was necessary to protect the stock, but were unable to agree on how that responsibility should be shared across management areas. The Commissioners recommended a TCEY of 1.32 million pounds for Area 2A, between the 2017 TCEY and a TCEY of 1.06 million pounds. The 2017 stock assessment was revised to use the 2016 weight-per-unit-effort (WPUE) for Area 2A, which resulted in a TCEY of 1.06 million pounds. The TCEY of 1.06 million pounds was used to mitigate uncertainty in the 2017 survey, which occurred months later than in previous years, and coincided with a hypoxic area and reduced landings at survey stations with previously consistent catch.

Alternative 3 (IPHC interim management procedure)

Under Alternative 3, the TCEY would be reduced to 0.59 million pounds under the IPHC's interim management procedure, resulting in a TAC of 0.47 million pounds for Area 2A. IPHC uses an apportionment structure that is based on the WPUE of the setline survey that estimates the distribution of the stock among management areas. Generally, the IPHC and NMFS have relied on these methods to help reduce the risk that harvests in a specific Area could cause localized depletion of that resource. The IPHC's interim management procedure seeks to maintain the total mortality of halibut across its range from all sources based on a reference level of fishing intensity so that the Spawning Potential Ratio (SPR) is equal to 46%. The catch limits that correspond to the reference fishing intensity of F46% SPR should result in a fish achieving 46% of its spawning potential over the course of its lifetime relative to what it would have achieved as part of an unfished stock. Lower values indicate higher fishing intensity.

An Economic Analysis of the Expected Effects of Each Selected Alternative Relative to the No Action Alternative

Alternative 1 (No Action/Status Quo)

Alternative 1 maintains the 2017 harvest limit, with a Total Constant Exploitation Yield (TCEY) of 1.47 million pounds. Retaining the 2017 catch limits for commercial and recreational fisheries would be expected to maintain similar social and economic conditions for halibut user groups during 2018. While Alternative 1 would temper some of the negative social and economic effects from reducing the halibut catch limits for the commercial sector in 2018, this harvest approach would greatly increase the risk that the halibut spawning biomass and fishery yield (effectively catch limits) would decline in the next three years. Alternative 1 brings an increased likelihood that status-quo yield in 2018 may need to be offset by reductions in future years (2019 through 2021) due to reduced fishery yield (catch limits) as compared to Alternatives 2 and 3.

Alternative 2 (Preferred Alternative)

Alternative 2 has a TCEY of 1.32 million pounds, a decrease of 150,000 pounds relative to no action. The resulting Area 2A TAC under this alternative is 1.19 million pounds.

Under Alternative 2, the impact to harvest and income opportunities comes from changes to the TAC. The TAC under Alternative 2 would be less than Alternative 1 and would provide fewer harvest and income opportunities, proportional to the 11 percent reduction in TAC. Reducing the halibut catch limits from the 2017 levels to Alternative 2 is expected to produce negative economic and social impacts on the commercial halibut sector and the recreational halibut sector relative to Alternative 1, in 2018. This reduction is not significant given the context of the overall fishery and coastal communities and the limited duration of the proposed reduction. Reducing halibut catch limits in the commercial and recreational fisheries for 2018 are expected to reduce some of the risk of a decrease in halibut spawning biomass and fishery yield projected for the following three years (2019 through 2021). Therefore, Alternative 2 could alleviate some of the future negative impacts to these user groups.

Alternative 3 (IPHC interim management procedure)

Under Alternative 3, the TCEY would be reduced to 0.59 million pounds under the IPHC's interim management procedure, resulting in a TAC of 0.47 million pounds for Area 2A. Alternative 3 would have substantial impacts on harvest and income opportunities in the Area 2A fishery. With a TAC of 0.47 million pounds for halibut, retention of halibut caught incidentally in the sablefish fishery would not be allowed. The commercial incidental salmon fishery would be allowed to retain 14,068 pounds of halibut, around half of the 10 year average for incidental retention. The directed commercial halibut fishery landed around 160,000 pounds over two days of fishing in 2017. Under Alternative 3, there would be a quota of only 79,720 pounds, that would likely amount to one fishing day. The Washington recreational fishery has the most effort out of the recreational fisheries in Area 2A, and would be most affected by Alternative 3. The first two days the fishery was open, 94,516 pounds of halibut were landed in Washington in 2017. Under Alternative 3, the entire Washington recreational allocation would be 108,758 pounds for the season. Sport fishing is important to the economies of coastal communities, and having only 1 to 2 fishing days (compared to the 5 to 9 days) in the Puget Sound, North and South Coast subareas would impact livelihoods of those reliant on recreational fisheries. Under Alternative 3, the impact to harvest and income opportunities comes from changes to the TAC. The TAC under Alternative 3 would be less than Alternative 1 and would provide fewer harvest and income opportunities. Reducing the halibut catch limits from the 2017 levels under Alternative 3 is expected to produce negative economic and social impacts on the commercial halibut sector and the recreational halibut sector relative to Alternative 1, in 2018. Reducing halibut catch limits in the commercial and recreational fisheries for 2018 are expected to reduce some of the risk of a decrease in halibut spawning biomass and fishery yield projected for the following three years (2019 through 2021). Therefore, Alternative 3 could alleviate some of the future negative impacts to these user groups.

RIR-Determination of Significant Impact

As noted above, under E.O. 12866, a regulation is a "significant regulatory action" if it is likely to: (1) have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan

programs or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order. Pursuant to the procedures established to implement section 6 of E.O. 12866, the Office of Management and Budget has determined that this action is not significant.

Reviewed by West Coast Regional Economist Abigail Harley

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