Environmental Assessment for a Regulatory Amendment to Modify Harvest Restrictions in Individual Fishing Quota and Western Alaska Community Development Quota Fisheries for Pacific Halibut in Areas 4C and 4D of the Bering Sea

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Abstract: This document is an Environmental Assessment (EA) for an action to amend halibut Individual Fishing Quota (IFQ) and Community Development Quota (CDQ) regulations that define regulatory fishing areas for these programs under the authority of both the National Marine Fisheries Service (NMFS) and International Pacific Halibut Commission (IPHC). In December 2004, the North Pacific Fishery Management Council (Council) identified its preferred alternative to allow holders of Area 4C halibut IFQ and CDQ to harvest such halibut IFQ/CDQ in Area 4D. It would allow additional fishing opportunities so that the assigned Area 4C IFQ and CDQ quotas for two Pribilof Island communities (St. Paul and St. George) in Area 4C may be attained. A complementary action by the IPHC, which is required to adopt this regulatory amendment, was approved in January 2005.

Comment Due Date: A public comment period will be announced by NMFS in the proposed rule.

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List of Acronyms

ADF&G	Alaska Department of Fish and Game
AFSC	Alaska Fisheries Science Center
BiOp	Biological Opinion
BS	Bering Sea
AI	Aleutian Islands
BSAI	Bering Sea and Aleutian Islands
CDQ	Community Development Quota
CEQ	Council of Environmental Quality
CEY	Constant Exploitation Yield
CFR	Code of Federal Regulations
CPUE	Catch Per Unit Effort
EA	Environmental Assessment
EIS	Environmental Impact Statement
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
FR	*Federal Register*
GOA	Gulf of Alaska
HAPC	Habitat Area of Particular Concern
IFQ	Individual Fisherman's Quota
IRFA	Initial Regulatory Flexibility Analysis
MMPA	Marine Mammal Protection Act
MSY	Maximum Sustainable Yield
mt	metric ton
NEPA	National Environmental Policy Act
nm	nautical mile
NMFS	National Marine Fishery Service
NOAA	National Oceanographic and Atmospheric Administration
OFL	Overfishing Level
OY	Optimum Yield
PBR	Potential Biological Removal
PSEIS	Programmatic Supplemental Environmental Impact Statement
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAFE	Stock Assessment and Fishery Evaluation Report
SEIS	Supplemental Environmental Impact Statement
TAC	Total Allowable Catch
USFWS	United States Fish and Wildlife Service

Executive Summary

The actions evaluated in this document

This document provides National Environmental Policy Act (NEPA) analysis for the action which would allow Area 4C IFQ or CDQ holders to harvest their IFQ or CDQ in Area 4D.

Purpose and Need

The purpose of this action is to allow additional harvesting opportunities for the small boat halibut IFQ and CDQ fisheries by local residents in Area 4C. This action would also potentially alleviate possible localized depletion occurring in Area 4C.

Halibut IFQ and CDQ fishermen in Area 4C have experienced a steady drop in catch rates since 1985. The drop is consistent among gear types and amounts to a decline in catch rates greater than 70 percent over the past ten years. The declines in catch rates and consequent poor harvests have generated considerable concern among Area 4C community residents who depend heavily on the halibut resource for support of their local economies. The preferred alternative, which was adopted by the Council at its December 2004 meeting, is necessary to allow Area 4C halibut IFQ or CDQ to be harvested in Area 4D and be counted against the Area 4C allocations. This action would allow additional harvesting opportunities for Area 4C IFQ or CDQ holders who have been unable to harvest their full allocations in recent years.

Environmental Assessment

An Environmental Assessment (EA) was prepared for this action to address the statutory requirements of the NEPA. The purpose of the EA is to predict whether the impacts to the human environment resulting from allowing Area 4C IFQ and CDQ holders to harvest their IFQ or CDQ in Area 4D will be "significant", as that term is defined under NEPA. If the predicted impacts from the preferred alternatives are found not to be significant, and that alternative is chosen, then a Finding of No Significant Impact (FONSI) will be issued and no further analysis is necessary to comply with the requirements of NEPA.

Alternatives

Alternative 1. No action.

Participants in IFQ and CDQ halibut fisheries are issued halibut allocations in a particular regulatory area and are prohibited from harvesting that allocation in another regulatory area (50 CFR 679.42(a)). Under Alternative 1, no action would be taken to allow area 4C halibut IFQ or CDQ to be taken in Area 4D.

(Preferred Alternative)
Alternative 2. Allow Area 4C IFQ or CDQ holders to harvest such IFQ or CDQ in Area 4D.
At the end of the third year after implementation, this action, if adopted will be evaluated.

Environmental Analysis

The EA evaluated the alternatives with respect to the following classes of effects:

- effects on target species
- effects on incidental catch of other and non-specified species
- effects on forage fish species
- effects on marine mammals and ESA listed marine mammals
- effects on seabirds
- effects on marine benthic habitat and essential fish habitat
- effects on the ecosystem

NEPA significance is determined by considering the context in which the action will occur and the intensity of the action. The context in which the action will occur includes the specific resources, ecosystem, and the human environment affected. The intensity of the action includes the type of impact (beneficial versus adverse), duration of impact, and other factors (see 40 CFR 1508.27(b)).

The intent of allowing Area 4C IFQ or CDQ holders to harvest their IFQ or CDQ in Area 4D is to balance the harvest of Pacific halibut during the fishing year consistent with established total optimum yield amounts, economic needs, and ecosystem needs. The effect of the alternatives must be evaluated for all resources, species, and issues that may directly or indirectly interact with the Pacific halibut fisheries within the action area. The impacts of the alternatives are assessed in section 4 of this EA. The summary of the impacts on the human environment is in section 6.0 of this EA and portions are provided in this Executive Summary.

The alternatives must be evaluated for all direct, indirect and cumulative effects on resources, species, and issues within the action area as a result of allowing Area 4C IFQ or CDQ holders to harvest their IFQ or CDQ in Area 4D. The impacts of the alternatives are assessed in Chapters 4 and 5 of this EA.

In addition to NEPA analyses applicable to the Pacific halibut fisheries, the significance of impacts of the actions analyzed in this EA were determined through consideration of the following information, as required by NEPA and 40 CFR 1508.27.

One of the purposes of an EA is to provide the evidence and analysis necessary to decide whether an agency must prepare an environmental impact statement (EIS). A FONSI is the decision maker's determination that the proposed action will not result in significant impacts to the human environment and therefore further analysis in an EIS is not needed. The Council on Environmental Quality regulations defines significance in terms of context and intensity (40 CFR 1508.27). To determine the significance of impacts of the actions analyzed in this EA, NMFS is required to consider the following:

Context

The setting of the proposed action is the halibut IFQ and CDQ fisheries in the Bering Sea off Alaska in Area 4C and 4D. Any effects of these actions are limited to these areas. The effects on society within these areas are on individuals directly and indirectly participating in the halibut IFQ and CDQ fisheries and those who use the ocean resources. The proposed actions include minor changes to currently allowed fishing practices among participants in the halibut fishery in Area 4C and 4D. This action has no significant impacts on society as a whole or regionally.

Intensity

A listing of considerations to determine intensity of the impacts are in 40 CFR § 1508.27 (b) and in the NOAA Administrative Order 216-6. Each consideration is addressed below in order as it appears in the regulations.

1. **Beneficial and adverse impacts are required to be considered in this action, including sustainability of target and non-target species, damage to ocean or coastal habitat or essential fish habitat, effects on biodiversity and ecosystems and marine mammals**. Impacts are limited to the participants in the halibut IFQ and CDQ fisheries in Areas 4C and 4D of the Bering Sea. Under Alternative 2, Allowing Area 4C halibut to be harvested in Area 4D may have a beneficial impact to eligible IFQ and CDQ holders in Area 4C by providing them increased access to the Area 4C-E halibut resource. No significant adverse impacts were identified for Alternative 2. There are no beneficial impacts associated with Alternative 1, and the negative impact associated with it is continued localized depletion in Area 4C.

2. **Public Health and Safety** may be positively impacted by allowing larger vessels in Area 4C to fish their IFQ and CDQ in Area 4D under Alternative 2. This would reduce pressure on near shore stocks of halibut in Area 4C, thereby increasing availability of halibut to smaller vessels near shore. Accessibility of the halibut resource close to shore would prevent smaller vessels from traveling further from shore to catch their allocation. The status quo under Alternative 1 would negatively impact small vessels by potentially requiring them to go further from shore to fish their IFQ or CDQ.

3. This action takes place in the geographic area of the Bering Sea. Even though this area contains **cultural resources and ecologically critical areas**, no effects on the unique characteristics of these areas are anticipated to occur with this proposed action.

4. The effects of this action on the human environment are not **controversial**. The preferred alternative is potentially socially and economically controversial because it could potentially redistribute and concentrate fishing effort from Area 4C into Area 4D. However, the preferred alternative was recommended by participants in Area 4C, Area 4D, (the entities that are subject to the regulations), and by the North Pacific Fishery Management Council.

5. The action analyzed in this EA is very limited in scope, and it is anticipated that there will be minimal or no **risk to the human environment, including social and economic effects**, by implementing this action. No significant adverse impacts were identified for Alternative 2.

6. **Future actions** related to this proposed action may result in impacts and are addressed in Chapter 5.0 of this EA. To the extent that future research indicates a further segregation of the halibut biomass in Area 4C-E to biologically distinct areas is necessary, additional action to review allowing Area 4C halibut IFQ or CDQ to be harvested in Area 4D may be necessary. Pursuant to NEPA, appropriate environmental analysis documents will be prepared to inform the public and decision makers of potential impacts of future actions on the human environment, and mitigation measures are likely to be implemented to avoid significantly adverse impacts.

7. **Cumulatively significant impacts, including those on target and non-target species** are not expected with this action. Cumulative impacts of the alternatives are analyzed in Chapter 5.0. The cumulative effects of this action, in combination with past actions, and reasonably foreseeable actions are

insignificant. Alternative 2 would make minor modifications to existing regulations and management measures applicable to the halibut IFQ and CDQ fisheries, which would result in no significant impact to the natural environment or socioeconomic conditions.

8. This action will have no effect on **districts, sites, highways, structures, or objects listed or eligible for listing in the National Register of Historic Places**, nor cause loss or destruction of significant scientific, cultural, or historical resources. This consideration is not applicable to this action.

9. NEPA requires NMFS to determine the degree an action may affect **threatened or endangered species or critical habitat under the ESA**. Details of potential effects are listed in section 4.5 and 4.6. Interactions between the Area 4C-E halibut IFQ or CDQ fishery and any listed marine mammal, fish, or seabird are insignificant under Alternatives 1 and 2.

10. This action poses **no known violation of Federal, State, or local laws or requirements for the protection of the environment**. Alternatives under this action would be conducted in a manner consistent, to the maximum extent practicable, with the enforceable provisions of the Alaska Coastal Management Program within the meaning of section 30(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

11. Alternatives 1 and 2 pose **insignificant effects on the introduction or spread of nonindigenous species** into the Bering Sea because they do not change fishing, processing or shipping practices that may lead to the introduction of non-indigenous species.

Comparison of Alternatives and Selection of the Preferred Alternative

Alternative 1 would maintain the status quo. Area 4C IFQ or CDQ holders would be allowed to harvest their IFQ or CDQ only in Area 4C. IFQ and CDQ holders would likely continue to be unable to harvest their full allocations under Alternative 1 and adverse economic conditions would likely persist.

Alternative 2 is the preferred alternative because: (1) it takes into account the best and most recent information available regarding the status of the Pacific halibut stock, public testimony, and economic concerns; (2) it would allow additional harvesting opportunities for the small boat halibut IFQ and CDQ fisheries in Area 4C; and (3) it is consistent with the Halibut Act, the Magnuson-Stevens Fishery Conservation and Management Act, and Endangered Species Act. Council of Environmental Quality regulations at 40 CFR 1508.14 describe the human environment. No significant impacts are anticipated to affect the human environment under this alternative, therefore precluding the need for an EIS.

Table ES-1 Summary of significant determinations with respect to direct and indirect impacts.

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown		
Issue	**Alt. 1**	**Alt. 2**
Target Fish Species (Section 4.2)		
Fishing mortality	I	I
Spatial temporal concentration of catch	I	I
Change in prey availability	I	I
Habitat suitability: change in suitability of spawning, nursery, or settlement habitat, etc.	I	I
Other and non-specified species (Section 4.3)		
Incidental catch of other species and non-specified species	I	I
Forage species (Section 4.4)		
Incidental catch of other species and non-specified species	I	I
Marine Mammals (Section 4.6)		
Incidental take/entanglement in marine debris	I	I
Spatial/temporal concentration of fishery	I	I
Global Harvest of prey species	I	I
Disturbance	I	I
Northern Fulmar (Section 4.7)		
Incidental take–BSAI	I	I
Prey availability	I	I
Benthic habitat	I	I
Short-tailed Albatross (Section 4.7)		
Incidental take	I	I
Prey Availability	I	I
Benthic Habitat	I	I

Other Albatrosses & Shearwaters (Section 4.7)			
Incidental Take		I	I
Prey Availability		I	I
Benthic Habitat		I	I

Piscivorous Seabirds (Also Breeding in Alaska) (Section 4.7)			
Incidental Take		I	I
Prey Availability		I	I
Benthic Habitat		I	I
Eiders (Spectacled and Stellers)			
Incidental Take		I	I
Prey Availability		I	I
Benthic Habitat		I	I
Other Seabird Species			
Incidental Take		I	I
Prey Availability		I	I
Benthic Habitat		I	I
Marine Benthic Habitat			
Level of mortality and damage to living habitat		I	I
Modification of Benthic Community Structure		I	I
Changes in Distribution of Fishing Effort		I	I
Ecosystem Considerations			
Predator-prey relationships			
Pelagic forage availability		I	I
Spatial and temporal concentration of fishery impact on forage		I	I
Removal of top level predators	Trophic level of catch	I	I
	Top predator bycatch levels	I	I
	Pop status of top predators	I	I

Introduction of nonnative species		I	I
Energy flow and balance			
Energy flow and balance	Trends in offal and discard production	I	I
	Scavenger population trends	I	I
	Bottom gear effort	I	I
Energy removal		I	I
Diversity			
Species diversity	Population levels of target and	I	I
	Bycatch amounts of sensitive	I	I
	Number of ESA listed marine	I	I
	Area closures	I	I
Functional diversity	Guild diversity or size diversity	I	I
	Bottom gear effort	I	I
	HAPC biota bycatch	I	I
Genetic diversity	Degree of fishing on spawning	I	I
	Older age group abundances of	I	I

1.0 Purpose and Need

1.1 Introduction

This analysis provides a National Environmental Policy Act (NEPA) Environmental Assessment (EA) for the proposed regulatory change to allow Area 4C IFQ or CDQ holders to fish their IFQ or CDQ in Area 4D. A Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Analysis (IRFA) was prepared as a separate document by the Council and is on file with the National Marine Fisheries Service, Alaska Region.

Location of key parts of the EA:

Description of the alternatives	Chapter 2
NEPA significance criteria	Section 4.1
NEPA direct and indirect effects analysis	Sections 4.2-4.9
NEPA Cumulative effects analysis	Chapter 5
NEPA conclusions	Chapter 6

This analysis incorporates by reference Section 1.2 and 1.3 of the Regulatory Impact Review (RIR) for this action regarding the management authority and background for Pacific halibut. Pacific halibut fisheries are managed by a Treaty between the United States and Canada through recommendations by NMFS, IPHC, and Council. The biology, fishery, and overall management of Pacific halibut off the west coast of North America and in the Bering Sea is described in an IPHC technical report (IPHC 1998).

The 2005 Pacific Halibut Fishery Management Measures regulate the halibut fishery (70 FR 9242) and are supplemented by regulations at 50 CFR part 300, subpart E. The IPHC accounts for halibut bycatch in determining the halibut total catch. This proposed action does not affect halibut bycatch. The halibut population assessment is prepared annually by the IPHC (IPHC 2005; Appendix A) and is incorporated here by reference. Total setline CEY (constant exploitation yield at a harvest rate between 20% and 22.5%) is still estimated to be very high, at just under 100 million pounds, which indicates the halibut resource is very robust. The current estimate of exploitable halibut biomass for 2005 is estimated at 179,169 mt, round weight. The exploitable biomass of the Pacific halibut stock apparently peaked at 326,520 mt in 1988 (Sullivan and Parma 1998). The long-term average reproductive biomass for the Pacific halibut resource was estimated at 118,000 mt (Parma 1998). Long-term average yield was estimated at 26,980 mt (Parma 1998).

Recent average commercial catches (1999-2003) were 32,759 mt for the entire Pacific halibut resource. The IPHC commercial quota for 2004 was 34,704 mt. The IPHC commercial quota for 2005 for the Pacific halibut stock is 33,484 mt, a decrease of 1,220 mt from the 2004 quota, but continues to reflect the good condition of the Pacific halibut resource. The outlook for the stock biomass over the near future is for a decline from recent high levels until increased recruitment to the stock occurs.

The IPHC considers the halibut resource to be a single population. (IPHC 1999) Egg and larval drift and subsequent counter migration by young halibut cause significant mixing within the halibut population. The IPHC sets halibut harvest in regulatory areas in proportion to abundance. This harvest philosophy protects against over harvest of what may be separate, but unknown, genetic populations, and spreads commercial fishing effort over the entire range to prevent regional depletion. Small-scale local depletion

does not have a significant biological effect for the resource as a whole. Ultimately, counter migration and local movement tend to fill in areas with low halibut density, although continued high exploitation will maintain local depletion. However, estimates of biomass and rates of local movement are not available to manage small areas.

The Area 4C and 4D halibut fisheries occur in the Bering Sea off western Alaska (see figure 1.2). The Council and NMFS have implemented the halibut catch sharing plan described in Section 1.3 of the RIR and Appendix C of this analysis as a means of allocating halibut in Areas 4C-E. A detailed description of the Area 4 halibut fishery is presented in the 1995 EA/RIR for the Catch Sharing Plan for Area 4 (NPFMC 1995) and subsequent modifications to allow Area 4D CDQ use in Area 4E (NMFS 2003). NMFS based the previous modifications to allow Area 4D CDQ use in Area 4E primarily on the rationale that the IPHC considers halibut in Areas 4C, 4D, and 4E (4C-E) to be a single stock and finds no biological or conservation basis for separate catch limits in these areas. This action proposes an analogous modification to allow Area 4C IFQ and CDQ use in Area 4D.

Table 1.1-1 Catch Sharing Plan for Area 4C-E

Area	**Percent of Area 4 CEY**
Area 4C	Area 4C-E CEY – 80,000 + 46.43%
Area 4D	Area 4C-E CEY - 80,000 + 46.43%
Area 4E	80,000 + 7.14%

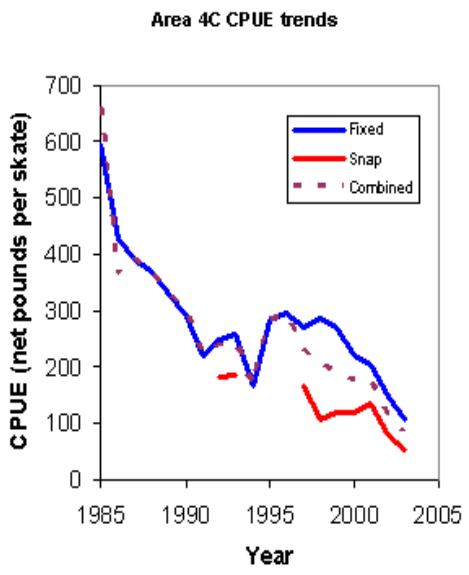

Figure 1.1-1 Area 4C CPUE trends, 1985-2005 (Hare 2005)

Halibut IFQ and CDQ fishermen in Area 4C have experienced a steady drop in catch rates since 1985. The drop is consistent among gear types and amounts to a decline in catch rates greater than 70 percent over the past ten years. The diminished catch rates have consequently resulted in the inability of halibut IFQ and CDQ fishermen in Area 4C to achieve the total harvest of their quota during the halibut fishing season. During the 2003 fishing season, Area 4C fishermen landed just 42 percent of their IFQ halibut allocation compared to a statewide average of 97 percent. Additionally, Area 4C CDQ fishermen landed only 45 percent of the Area 4C CDQ halibut allocation during the 2003 fishing season compared to an average of 94 percent in other CDQ areas. The declines in catch rates and consequent poor harvests have generated considerable concern among Area 4C community residents who depend heavily on the halibut resource for support of their local economies.

Recent research conducted by the IPHC indicates localized depletion in Area 4C. Localized depletion results from concentrated fishing effort in a limited area that exceeds the biologically sustainable level for fishing in that area. Although effort and catches of halibut have increased in Area 4C over the last 10 years, catch per unit effort (CPUE) has declined steadily since commercial fishing began (Figure 1.1-1). Catches increased because fishing effort increased, offsetting the decline in CPUE. IPHC research shows that a comparison of CPUE with effort denotes a strongly negative relationship that indicates a continuous pattern

of increasing effort and decreasing CPUE. The IPHC suggests that effort is currently excessive in Area 4C and increases in effort are no longer sufficient to attain previous catches (Hare 2005).

The IPHC also suggests that localized depletion is concentrated within Area 4C. The commercial catch taken in Area 4C is highly concentrated around the two Pribilof Islands of St. Paul and St. George. For commercial catches between 1993 and 2004 with known latitude/longitude locations, approximately 73 percent of the Area 4C catch was taken within 18 nautical miles of St. Paul Island and 25 percent within 18 nautical miles of St. George Island. More importantly, much of the directed effort for the halibut fishery during the 1993-2004 time period occurred in relatively small areas south of the Pribilof Islands and were concentrated in the southwest corner of Area 4C (Hare 2005).

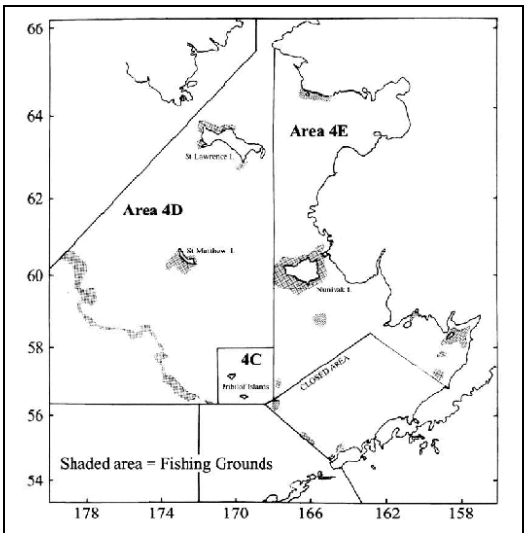

Figure 1.1-2 IPHC Area 4C-E Fishing Grounds (Hare, pers. comm.)

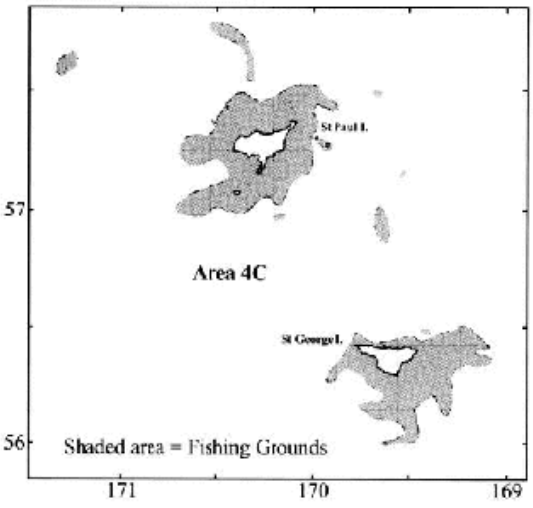

Figure 1.1-3 Area 4C fishing grounds (Hare, pers. comm..)

The IPHC notes that 46.43 percent of the entire Area 4C-E catch limit is allotted for only 5.1 percent of the total Area 4C-E fishing grounds located in Area 4C. The available fishing grounds in Area 4C consists of only 561 square nautical miles out of a total of 11,076 square nautical miles comprising Area 4C (Hoag, et al, 1997; See Figure 1.1-2). The limited fishing grounds in Area 4C results in concentrated fishing effort in a relatively small fishing area. The IPHC also states that incidental catch of halibut in other fisheries has reduced recruitment and immigration into Area 4C, further exacerbating the localized depletion (Hare 2005).

Diminished harvests, limited fishing grounds, and reduced recruitment and immigration suggests a decrease in halibut abundance over time in Area 4C which results in a decreased CPUE. The IPHC recommends a reduction in effort in Area 4C to observe how the halibut biomass responds and further determine the productivity of stock (Hare 2005).

1.2 National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 requires a description of the purpose and need for the proposed actions as well as a description of alternative actions which may address the identified problem(s). National Oceanic and Atmospheric Administration Administrative Order (NAO) 216-6 provides the policies and procedures to be followed by NMFS when assessing environmental issues.

These criteria are based on, and expand upon, the criteria developed by the Council on Environmental Quality (CEQ) guidelines.

The human environment is defined by CEQ (40 CFR 1508.14) as including the natural and physical environment and the relationships of people with that environment. This means that economic or social effects are not intended by themselves to require preparation of an Environmental Impact Statement (EIS). However, when an EIS is prepared and economic or social and natural or physical environmental impacts are interrelated, the EIS must discuss all of these impacts on the quality of the human environment. If the EA indicates that the preferred alternative has the potential to significantly impact the human environment, then an EIS is required. If the EA finds that the preferred alternative will not significantly impact the human environment, then the Secretary will provide a FONSI.

The purpose of this EA is to assess the impacts of the proposed Federal action to allow Area 4C IFQ or CDQ holders to harvest Area 4C IFQ or CDQ in Area 4D. This action is considered to be subject to the requirements of NEPA to prepare an EA since it may impact the human environment. The EA must include a brief discussion of the need for the proposal, the alternatives considered, the environmental impacts of the proposed action and the alternatives and a list of the document preparers. The need for the proposal was discussed in section 1.1, the alternatives considered are addressed in section 2.0, and the list of preparers is in section 8.0. Sections 4 and 5 contain a discussion of the environmental impacts of the alternatives under consideration for this fishery management action, including impacts on endangered and threatened species protected under the Endangered Species Act (ESA) and impacts on marine mammals as required by the Marine Mammal Protection Act (MMPA).

1.3 The Endangered Species Act (ESA)

The Endangered Species Act of 1973 as amended (16 U.S.C. 1531 *et seq*; ESA), provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The designation of either threatened or endangered is based on the biological health of a particular species. The ESA is administered jointly by NMFS for most marine mammal species, marine and anadromous fish species, and marine plants species and by the U.S. Fish and Wildlife Service (USFWS) for bird species, and terrestrial and freshwater wildlife and plant species. Each agency is responsible for listing the species under its respective purview. Twenty-five species occurring in the BSAI and/or GOA are currently listed under the ESA, as denoted in Table 6.0-2.

Federal agencies must conserve listed species. One assurance of this is that Federal actions must be in compliance with the provisions of the ESA. Section 7 of the ESA provides a mechanism for consultation by the Federal action agency with the appropriate expert agency (NMFS or USFWS). Because the Pacific halibut fishery is a federally regulated activity, any negative effect of the fishery on listed species or critical habitat and any takings that may occur are subject to ESA section 7 consultation. NMFS initiates the consultation and the resulting biological opinions are issued to NMFS. The Council may be invited to participate in the compilation, review, and analysis of data used in the consultations. The determination of whether the action "is likely to jeopardize the continued existence of" endangered or threatened species or result in the destruction or modification of critical habitat is the responsibility of the appropriate agency (NMFS or USFWS). If the action is determined to result in jeopardy, the opinion includes reasonable and prudent alternatives that are necessary to alter the action so that jeopardy is avoided. If an incidental take of a listed species is expected to occur under normal promulgation of the action, an incidental take statement is appended to the biological opinion.

Section 7 consultations with respect to actions of the federal groundfish fisheries have been done for all of the above listed species, either individually or in groups. See section 3.4 of the PSEIS (NMFS 2004) for a complete section 7 consultation history. Consultations have typically been done with respect to the effects of groundfish fisheries on listed species.

1.4 The Marine Mammal Protection Act (MMPA)

Under the Marine Mammal Protection Act, commercial fisheries are classified according to current and historical data on whether or not the fishery interacts with marine mammals. Two groups, takers and non-takers, are initially identified. For takers, further classification then proceeds on the basis of which marine mammal stocks interact with a given fishery. Fisheries that interact with a strategic stock at a level of take which has a potentially significant impact on that stock would be placed in Category I. Fisheries that interact with a strategic stock and whose level of take has an insignificant impact on that stock, or interacts with a non-strategic stock at a level of take which has a significant impact on that stock are placed in Category II. A fishery that interacts only with non-strategic stocks and whose level of take has an insignificant impact on the stocks is placed in Category III. Varying degrees of reporting and observer requirements are necessary under each category.

1.5 Essential Fish Habitat (EFH)

Section 303(a)(7) of the Magnuson-Stevens Act requires all FMPs to describe and identify Essential Fish Habitat (EFH). EFH is considered "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." FMPs must also minimize effects on EFH caused by fishing. As Pacific halibut is not an FMP managed species, EFH requirements are not applicable to halibut related fishery actions. However, any groundfish caught in conjunction with the Area 4C and 4D halibut fishery are managed under the BSAI FMP. This EA includes by reference the analysis in Chapter 3.6 of the PSEIS (NMFS 2004) regarding the effects of commercial groundfish fishing on substrate and benthic habitat, since no information is available on impacts of the commercial halibut fishery. This EA also includes by reference the analysis in Sections 3.1.2, 3.2.2.2, and 3.3.1 of the Preliminary Final Environmental Impact Statement (EIS) for Essential Fish Habitat (EFH) in Alaska regarding Pacific halibut habitat (NMFS 2005).

Halibut are found along the continental shelf of the Bering Sea and along the Aleutian Islands. Adult halibut are demersal, and live on or near the bottom of the ocean. They can be found in a broad range of bottom habitat, including rock, sand, gravel, and mud. Halibut concentrate on spawning grounds along the edge of the continental shelf from November to March, and migrate to shallower coastal waters during the remaining months of the year. The commercial halibut season begins in mid-March and ends in mid-November. The directed commercial fishery may only use hook-and-line gear, and typically uses longline gear to prosecute the fishery. In general, a unit of longline gear (skate) consists of a length of groundline to which shorter branch lines and hooks are attached. Multiple skates, with baited hooks, are deployed in a string. Each such set is left to soak for a period of time and then retrieved. Besides halibut, other animals caught on such gear may include a variety of groundfish species. As discussed in section 4.3, NMFS has limited information about the catch of other species associated with the halibut fisheries in Area 4C-E.

All the marine waters and benthic substrates in the Bering Sea comprise the marine habitat for Pacific halibut and other groundfish. Convention waters constitute all waters in which halibut occur; therefore the adjacent marine waters outside the groundfish EEZ, adjacent State waters, shoreline, freshwater

inflows, and atmosphere above the waters, constitutes habitat for prey species, other life stages, and species that move in and out of, or interact with, the groundfish species are included therein. Distinctive aspects of the habitat include water depth, substrate composition, substrate infauna, light penetration, water chemistry (salinity, temperature, nutrients, sediment load, color, etc.), currents, tidal action, phytoplankton and zooplankton production, associated species, natural disturbance regimes, and the seasonal variability of each aspect. Substrate types include bedrock, cobbles, sand, shale, mud, silt, and various combinations of organic material and invertebrates which may be termed biological substrate. Biological substrates present in these management areas include corals, tunicates, mussel beds, tube worms. Biological substrate has the aspect of ecological state (from pioneer to climax) in addition to the organic and inorganic components. Ecological state is heavily dependent on natural and anthropogenic disturbance regimes. The IPHC has developed some descriptions of habitat preferences of Pacific halibut (Hoag et al 1997) and continues research into the biological requirements for each life history stage that are known. Much remains to be learned about habitat requirements for Pacific halibut and many other target groundfish species.

1.6 The Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS) and the Pacific Halibut fishery

Although the proposed action is not a project level action within the fishery management programs under the groundfish FMPs, the affected environment, gear and methods, and other species affected in the Pacific halibut fishery corresponds with those found in other groundfish fisheries. In September 2004, NMFS completed a PSEIS that analyzed the impacts of the groundfish fisheries program on the human environment. The following provides information on the relationship between this EA and the PSEIS.

The Alaska Groundfish Fisheries PSEIS has multiple purposes. First, it serves as the central environmental document supporting the management of the BSAI and GOA groundfish fisheries. The historical and scientific information and analytical discussions contained therein are intended to provide a broad, comprehensive analysis of the general environmental consequences of fisheries management in the Exclusive Economic Zone (EEZ) off Alaska. The document also provides agency decision-makers and the public with an analytical reference document necessary for making informed policy decisions in managing the groundfish fisheries and sets the stage for future management actions. In addition, it describes and analyzes current knowledge about the physical, biological, and human environment in order to assess impacts resulting from past and present fishery activities. The PSEIS is intended to bring both the decision-maker and the public up to date on the current state of the environment, while describing the potential environmental consequences of alternative policy approaches and their corresponding management regimes for management of the groundfish fisheries off Alaska. In doing so, it serves as the overarching analytical framework that will be used to define future management policy with a range of potential management actions.

This EA thus incorporates by reference information presented in the PSEIS on the status of the environment and impacts of groundfish fisheries, including the Pacific halibut fishery, on the human environment. This EA incorporates information from the PSEIS for three reasons: (1) the environment affected by the Pacific halibut fishery is the same as that affected by the groundfish fisheries (2) the gear and methods used in the Pacific halibut fisheries are the same as those used in the groundfish fisheries, and (3) other species affected in the Pacific halibut fishery corresponds with those found in the Bering Sea groundfish fisheries. Detailed discussions that are provided in the PSEIS that are applicable to this analysis are referenced and, as necessary, summarized in this EA. The Affected Environment Section (Chapter 3) of this document adopts by reference much of the affected environment discussion in the

PSEIS. Additional detailed information is provided if new information became available after January 2002, or if the PSEIS did not cover the topic in sufficient detail to support this analysis.

2.0 Description of Alternatives

The following alternatives were considered for this action.

Alternative 1. No action.

Participants in IFQ and CDQ halibut fisheries are issued halibut allocations in a particular regulatory area and are prohibited from harvesting that allocation in another regulatory area (50 CFR 679.42(a)). Under Alternative 1, no action would be taken to allow area 4C halibut IFQ or CDQ to be taken in Area 4D.

(Preferred Alternative)
Alternative 2. Allow Area 4C IFQ or CDQ holders to harvest such IFQ or CDQ in Area 4D.
At the end of the third year after implementation, this action, if adopted will be evaluated.

The preferred alternative, which was adopted by the Council at its December 2004 meeting, would allow Area 4C halibut IFQ or CDQ to be harvested in Area 4D and be counted against the Area 4C allocations. It is intended to allow additional harvesting opportunities for the small boat halibut IFQ and CDQ fisheries by local residents in Area 4C. It would require approval of revisions to the NMFS regulations by the Secretary of Commerce. It also required complementary action by the IPHC, which occurred in January 2005. Representatives from four groups representing St. Paul fishermen (CBSFA, TDX Corporation, Tribal Government of St. Paul, and Aleutian Pribilof Island Association) and two St. Paul fishermen commented on the economic emergency facing local fishermen and the speed with which they are requesting the regulatory changes become effective. No public comments were received in opposition to the preferred alternative.

It is the Council's intent that the regulatory revisions, if approved by the Secretary, be implemented as soon as possible to provide economic relief to local fishermen early in the 2005 IFQ and CDQ season.

3.0 The Affected Environment

The NEPA documents listed below contain extensive information on the fishery management areas, marine resources, ecosystem, social, and economic parameters of the halibut fishery. Rather than duplicate an affected environment description here, readers are referred to these documents, which are incorporated by reference into this document.

Additionally, the Ecosystem Considerations section of the 2004 SAFE reports is included as Appendix C to this EA. It contains summaries and pointers to recent studies and information applicable to understanding and interpreting the criteria used to evaluate significance of impacts that will result from the potential relocation of fishing effort under these alternatives.

Detailed descriptions of the fishery may be found in the following reports. All of these are public documents and are readily available in printed form or over the Internet at links given in the references.

IPHC 2004 Pacific Halibut Stock Assessment The IPHC completed the annual report for the 2004 assessment of the Pacific halibut stock (IPHC 2005). Each year the IPHC staff assesses the abundance and potential yield of Pacific halibut using all available data from the commercial fishery and scientific surveys. Exploitable biomass in each of IPHC regulatory areas 2B, 2C, 3A, 3B, 4A, and 4B is estimated

by fitting a detailed population model to the data from that area, going back to 1974 in the eastern areas and to 1996 in Areas 3B and 4. Exploitable biomass in Areas 2A and 4CDE is estimated by applying a survey-based estimate of relative abundance to the analytical estimate of biomass in the adjoining area (2B for 2A, 4A for 4CDE). The Annual Pacific Halibut Stock Assessment serves as the principal document for determining biological target level for total removals in the Pacific halibut fishery by applying a fixed harvest rate to the estimate of exploitable biomass.

Steller Sea Lion Protection Measures SEIS A supplemental environmental impact statement was completed in 2001 (NMFS 2001b) to evaluate modifications of fishery management measures being made to mitigate impacts on Steller sea lions. The purpose of the SEIS was to provide information on potential environmental impacts that could occur from implementing a suite of fisheries management measures such that the western population of Steller sea lions existence neither is jeopardized nor its critical habitat adversely modified by the groundfish fisheries in the GOA and the BSAI. Fisheries management measures considered were designed to allow commercial groundfish fishing in the North Pacific while assuring that the fisheries would neither jeopardize the continued existence of both western and eastern Steller sea lion stocks, nor adversely affect their critical habitat. Alternative 4, the area and fishery specific approach, was selected in the Record of Decision. Revision of fishery management measures in accordance with that decision has been promulgated through proposed and final rulemakings in accordance with Magnuson-Stevens Act procedures.

Groundfish PSEIS A final programmatic SEIS (PSEIS) has been prepared to evaluate the fishery management policies embedded in the Bering Sea groundfish fisheries against policy level alternatives. Although not specific to halibut, the groundfish PSEIS addresses the halibut fishery and the direct and indirect effects that occur in the hook and line fisheries. While affecting the public decision-making process prescribed by the National Environmental Policy Act, the PSEIS also serves as a primary environmental document for subsequent analyses of environmental impacts on the groundfish fisheries. For more information see the http://www.fakr.noaa.gov/sustainablefisheries/seis/default.htm website.

This EA incorporates by reference the analyses and information provided in the PSEIS, as recommended by the Council for Environmental Quality regulations (see Section 1.6 above). Chapter 3 of the PSEIS establishes an environmental baseline, a description of existing conditions that serves as the starting point for the document's analyses. That description of baseline environmental conditions was developed using the best available scientific information, which at the time that the PSEIS was drafted incorporated data up to 2002. This EA uses the PSEIS baseline as a starting point for the present evaluation of environmental effects and, therefore, incorporates the PSEIS baseline by reference into this document.

The PSEIS provides a recent, complete description of the environment that may be affected by Pacific halibut fishing activities in the following sections:

Features of the physical environment, Section 3.3.
Threatened and endangered species, Section 3.4
Groundfish resources, including halibut, Section 3.5,
Incidentally caught species, Section 3.5
Habitat, Section 3.6.
Seabirds, Section 3.7
Marine mammals, Section 3.8.
Socioeconomic Conditions, Section 3.9
Ecosystem, Section 3.10.

Preliminary Final Environmental Impact Statement (EIS) for Essential Fish Habitat (EFH) in Alaska The EFH EIS evaluates alternatives and environmental consequences for three actions: (1) describing and identifying EFH for fisheries managed by the Council; (2) adopting an approach for the Council to identify Habitat Areas of Particular Concern within EFH; and (3) minimizing to the extent practicable the adverse effects of Council-managed fishing on EFH. For more information see the http://www.fakr.noaa.gov/habitat/seis/efheis.htm web site.

4.0 Environmental Impacts

The environmental impacts generally associated with fishery management actions are effects resulting from (1) harvest of fish stocks which may result in changes in food availability to predators and scavengers, changes in the population structure of target fish stocks, and changes in the marine ecosystem community structure; (2) changes in the physical and biological structure of the marine environment as a result of commercial fishing practices, e.g., effects of gear use and fish processing discards; and (3) entanglement/entrapment of non-target organisms in active or inactive commercial fishing gear. Each of these general impacts and additional specific impacts are analyzed in relation to the alternatives as they affect the Pacific halibut resource below.

4.1 Significance Analysis

An EA must consider whether an environmental impact is significant. Significance is determined by considering the contexts (geographic, temporal, societal) in which the action will occur, and the intensity of the action. The evaluation of intensity should include consideration of the magnitude of the impact, the degree of certainty in the evaluation, the cumulative impact when the action is related to other actions, the degree of controversy, and violations of other laws. The environmental impacts associated with this action include potential effects on Pacific halibut, on other animals caught incidental to the halibut IFQ or CDQ fisheries, and on habitat in the areas in which the halibut IFQ or CDQ fisheries are conducted.

The EA evaluated the specifications alternatives with respect to the following classes of effects:

- effects on target species
- effects on incidental catch of other species
- effects on forage fish species
- effects on marine mammals and ESA listed marine mammals
- effects on seabirds
- effects on marine benthic habitat and essential fish habitat
- effects on the ecosystem

NEPA significance is determined by considering the context in which the action will occur and the intensity of the action. The context in which the action will occur includes the specific resources, ecosystem, and the human environment affected. The intensity of the action includes the type of impact (beneficial versus adverse), duration of impact, and other factors (see 40 CFR 1508.27(b)).

“Effects,” as defined under NEPA, include:

- Direct effects, which are caused by the action and occur at the same time and place.
- Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects

and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Five significance assignments are made in this EA. These are:

Significantly adverse (S-): Significant adverse effect in relation to the reference point and based on ample information and data and the professional judgment of the analysts who addressed the topic.

Insignificant impact (I): Insignificant effect in relation to the reference point; this determination is based on information and data, along with the professional judgment of the analysts, that suggest that the effects will not cause a significant change to the reference point condition.

Significant beneficial (S+): Significant beneficial effect in relation to the reference point and based on ample information and data and the professional judgment of the analysts who addressed the topic.

Unknown (U): Unknown effect in relation to the reference point; this determination is characterized by the absence of information and data sufficient to adequately assess the significance of the impacts, either because the impact is impossible to predict, or because insufficient information is available to determine a reference point for the resource, species, or issue.

No effect (NE): No known impact

The "reference point condition," where used, may be considered the state of the environmental component being analyzed where it is believed to be in healthy condition, in equilibrium with its physical or biological environment, or is in a condition judged to be not threatened adversely at the present time. For example, a "reference point condition" for a fish species would be the state of that species such that it is in healthy condition, able to sustain itself, successfully reproducing, and not threatened with an adverse population-level decline.

Table 4.1-1 Reference points for significance determinations

Reference Point	Application
Current population trajectory or harvest rate of subject species	(1)Marine mammals (2)Target commercial fish species (3)Incidental catch of other species (4)Forage species (5)ESA list Pacific salmon (6)Seabirds
Global harvest of prey species. Temporal dispersion of harvest of prey species.	Steller sea lions
Current size and quality of marine benthic habitat and other essential fish habitat	Marine benthic habitat and other essential fish habitat
Application of principles of ecosystem management	Ecosystem
Current management and enforcement activities	Management complexity and enforcement
Current rates of fishing accidents	Human safety and private property (vessels)

Effects on Target Species

The target species for this action includes Pacific halibut in IPHC Area 4C-E. Accordingly, a specific catch limit is established annually for the Pacific halibut stock by IPHC subarea. The catch limit for each subarea is based on the minimum spawning biomass established by the IPHC. Minimum spawning biomass is analogous to the minimum stock size threshold (MSST) established for targeted groundfish stocks, which represents the minimum stock size allowable under exploitation that continues to maintain the long-term sustainability of the fishery. A fishing operation can affect its own target, but it can also affect other species through incidental catches. Alternatives are evaluated with respect to four potential impacts:

1. How much effect does the alternative have on fishing mortality?
2. How much effect does the alternative have on spatial or temporal concentration of the species (as manifested by changes in genetic structure of the population or changes in reproductive success)?
3. How much effect does the alternative have on the availability of prey for the target species?
4. How much effect does the alternative have on the target species' habitat?

The reference point against which each question is assessed is the current population trajectory or harvest rate of the subject target fish species (Table 4.1-2).

Table 4.1- 2 Criteria used to estimate the significance of effects on Pacific halibut targeted in the Bering Sea

Intensity of the Effects				
Direct Effects	Significant Adverse	Unknown	Insignificant Impact	Significant Beneficial
Fishing mortality	Reasonably expected to jeopardize the capacity of the stock to produce MSY on a continuing basis	Unknown fishing mortality rate	Reasonably *not* expected to jeopardize the capacity of the stock to produce MSY on a continuing basis	Action allows the stock to return to its unfished biomass

Spatial and temporal distribution of catch	Leads to change in genetic structure of population	Evidence of genetic sub-population structure and evidence that the distribution of harvest leads to a detectable reduction in genetic diversity such that it jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass	Minimum spawning biomass and genetic structure is unknown, therefore no information to evaluate whether distribution of the catch changes the genetic structure of the population such that it jeopardizes *or* enhances the ability of the stock to sustain itself at or above the minimum spawning biomass	Evidence that the distribution of harvest is *not* sufficient to alter the genetic sub-population structure such that it jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass	Evidence of genetic sub-population structure and evidence that the distribution of harvest leads to a detectable increase in genetic diversity such that it enhances the ability of the stock to sustain itself at or above the minimum spawning biomass
	Change in reproductive success	Evidence that the distribution of harvest leads to a detectable decrease in reproductive success such that it jeopardizes the ability of the stock to sustain itself at or above minimum spawning biomass	Minimum spawning biomass is unknown therefore no information regarding the potential impact of the distribution of the catch on reproductive success such that it jeopardizes *or* enhances the ability of the stock to sustain itself at or above the minimum spawning biomass	Evidence that the distribution of harvest will *not* change reproductive success such that it jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass	Evidence that the distribution of harvest leads to a detectable increase in reproductive success such that it enhances the ability of the stock to sustain itself at or above minimum spawning biomass

Change in prey availability	Evidence that current harvest levels and distribution of harvest lead to a change prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass	Minimum spawning biomass is unknown therefore no information that current harvest levels and distribution of harvest lead to a change in prey availability such that it enhances *or* jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass	Evidence that current harvest levels and distribution of harvest do *not* lead to a change in prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass	Evidence that current harvest levels and distribution of harvest lead to a change in prey availability such that it enhances the ability of the stock to sustain itself at or above the minimum spawning biomass
Habitat: Change in suitability of spawning, nursery, or settlement habitat, etc. due to fishing	Evidence that current levels of habitat disturbance are sufficient to lead to a decrease in spawning or rearing success such that it jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass	Minimum spawning biomass is unknown therefore no information that current levels of habitat disturbance are sufficient to lead to a detectable change in spawning or rearing success such that it enhances *or* jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass	Evidence that current levels of habitat disturbance are not sufficient to lead to a detectable change in spawning or rearing success such that it jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass	Evidence that current levels of habitat disturbance are sufficient to lead to an increase in spawning or rearing success such that it enhances the ability of the stock to sustain itself at or above the minimum spawning biomass

Effects on Incidental Catch of Other Species

Little is known about the catch of species other than halibut in the Area 4C halibut IFQ and CDQ fisheries. Other species include commercially valuable species such as groundfish or salmon, which are targeted commercially valuable species. Non-specified species include a large and diverse category encompassing everything not listed in the BSAI and GOA Groundfish FMP as a target, prohibited, forage, or other species. Non-specified species include everything from starfish to chimeras.

NMFS has some limited information about the catch of other species associated with the halibut fisheries in Area 4C and 4D. Vessels equal to or greater than 60 feet LOA fishing for halibut CDQ are required to carry a NMFS-certified observer on each CDQ fishing trip. The observer is required because the catch of any groundfish species allocated to the CDQ Program by these vessels is required to be subtracted from the CDQ group's allocation. Most of the vessels that have participated in these fisheries are less than 60 feet length overall (LOA) and, therefore, are not required to carry observers. However, in 2000, observers collected catch information from five longline vessels that landed halibut CDQ from Area 4D. On all but one of the fishing trips by these vessels, the vessel operator was targeting a groundfish species such as cod, Greenland turbot, or sablefish and the halibut CDQ was retained as incidental catch in these groundfish fisheries. One vessel had one trip in Area 4D in which halibut represented the predominant species caught. In five sets, the only other species reported by the observer in addition to halibut were 1 skate, 6 starfish, and 5 blue king crab. No seabirds were recorded as bycatch in the observed halibut CDQ fisheries in Area 4.

The criteria applied to target species are arguably relevant for other species. Naturally, the total catch of other species increases as the total catch of target species, in this case Pacific halibut, increases. However, the information available for non-specified species is much more limited than that available for target fish species. Estimates of biomass, seasonal distribution of biomass, and natural mortality are unavailable for most non-specified species. Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.6 of the PSEIS (NMFS 2004) and relate to Pacific halibut with respect to the longline groundfish fishery.

Predictions of impacts from different levels of harvest are therefore qualitatively described. Direct effects include the removal of other and non-specified species from the environment as incidental catch in the groundfish fisheries. Indirect effects can include habitat disturbance by fishing gear and disruption of food web interactions by disproportionate removal of one or more trophic levels.

The reference point against which significance was assessed was the current population trajectory or harvest rate of other and non-specified species. For analytical purposes, this is assumed to be the trajectory or rate in 2004. The criterion for evaluating significance was whether a substantial difference in harvest of non-specified species would occur (+>50% = adverse or - > 50%=beneficial).

Table 4.1-3 Criteria used to estimate the significance of effects on incidental catch of other species and non-specified species in the Bering Sea

Effect	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Incidental catch of other species and non-specified species	Reasonably expected to increase harvest levels by >50%.	Reasonably expected to not increase or decrease harvest levels by >50%.	Reasonably expected to decrease harvest levels by >50%.	Insufficient information available to predict harvest change.

Effects on Forage Fish Species

Forage fish are fish eaten by larger predatory fish, seabirds, or marine mammals, usually swimming in large schools. In this analysis the species referred to as forage fish species are limited to those species found in regulations in Table 2 to 50 CFR §679. The forage fish species categories include (but are not limited to) eulachon, capelin, smelts, lanternfishes, Pacific sand lance, Pacific sand fish, gunnels, pricklebacks, krill, and Pacific herring. A great many other species occupy similar trophic levels in the food chain to forage fish as species preyed upon by higher trophic levels at some period during their life history, such as juvenile and adult pollock and Pacific cod.

Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.5 of the PSEIS (NMFS 2004) and the Ecosystems Considerations for 2005 (Appendix C). Surveys conducted by NMFS are not designed to assess the biomass of forage fish species. Estimates of biomass and seasonal distribution of biomass are poor for forage fish species, therefore the effects of different levels of target species harvest on forage fish species are not quantitatively described.

Direct effects include the removal of forage fish species from the environment as incidental catch in the groundfish and Pacific halibut fisheries. Indirect effects may include competition between groundfish and forage fish for available prey, habitat disturbance by fishing gear, and disruption of food web interactions by disproportionate removal of one or more trophic levels. Insufficient information is available to estimate the effects of changes in the incidental catch of forage species quantitatively.

The reference point against which forage fish effects are assessed is the current population trajectory or harvest rate of the Pacific halibut (Table 4.1-1). For analysis purposes, this is assumed to be rates in 2004. The criterion for evaluating significance was a substantial change in incidental catch amount (+>50% = adverse or -> 50%= beneficial) based on the significance criteria in Table 4.1-4.

Table 4.1-4 Criteria used to estimate the significance of effects on incidental catch of forage fish species in the Bering Sea

Effect	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Incidental catch of other species and non-specified species	Reasonably expected to increase harvest levels by >50%.	Reasonably expected to not increase or decrease harvest levels.	Reasonably expected to decrease harvest levels by >50%.	Insufficient information available to predict change in harvest levels.

Effects on Marine Mammals and ESA Listed Marine Mammals

Direct and indirect interactions between marine mammals and halibut harvest may occur due to overlap in the size and species of groundfish harvested in the fisheries that are also important marine mammal prey, and due to temporal and spatial overlap in marine mammal foraging and commercial fishing activities. Impacts of the alternatives are analyzed by addressing four core questions, modified from Lowry (1982):

1. Do the proposed harvest levels result in increases in direct interactions with marine mammals (incidental take and entanglement in marine debris)?
2. Do the proposed harvest levels remove prey species at levels that could compromise foraging success of marine mammals (harvest of prey species)?
3. Do the proposed harvest levels result in temporal or spatial concentration of fishing effort in areas used for foraging by marine mammals (spatial and temporal concentration of removals with some likelihood of localized depletion)?
4. Do the proposed harvest levels modify marine mammal foraging behavior to the extent that population level impacts could occur (disturbance)?

The reference point for determining significant impact to marine mammals is predicting whether the proposed harvest levels will impact the current population trajectory of any marine mammal species or if the impact is likely to be different from existing impacts. Significance ratings for each question are summarized in Table 4.1-5.

Table 4.1-5 Criteria for determining significance of effects to marine mammals.

Effects	Significance Criteria			
	Significant Adverse	**Insignificant**	**Significant Beneficial**	**Unknown**
Incidental take/ entanglement in marine debris	Take rate increases downward change in population trajectory by >10%	Level of take below that which would have an effect on population trajectories by > 10%	Not Applicable	Insufficient information available on take rates
Spatial/ temporal concentration of fishery	More temporal and spatial concentration in key areas than previous protection measures	Temporal and spatial concentration of fishery same as previous protection measures.	Much less temporal and spatial concentration of fishery in all key areas than previous protection measures	Insufficient information as to what constitutes a key area or important time of year
Global harvest of prey species*	Harvest level exceeds harvest allowed by the harvest control rule	Harvest level at or below harvest control rule	Not applicable	Insufficient information to determine level of harvest in relation to available prey biomass
Disturbance	More disturbance (closed areas reopened) than previous protection measures	Similar level of disturbance as that which was occurring previously	Much less disturbance by halibut fishery	Insufficient information as to what constitutes disturbance

* applies to western DPS of Steller sea lions

Effects on Marine Mammals

ESA listed Steller sea lions have significance criteria based on the Steller sea lion protection measures. These measures require the overall harvest of pollock, Pacific cod, and Atka mackerel to fall within a harvest control rule specified in regulations at 50 CFR 679.20(d)(4). Seasonal apportionment of harvest also is specified for these prey species at 50 CFR 679.20(a)(5), (a)(7), and (a)(8). Closure areas providing spatial dispersion of these fisheries and closures for protection of other marine mammals are at 50 CFR 679.22. The Pacific halibut fisheries affect Steller sea lions through the incidental catch of prey species and gear entanglement.

Effects on Seabirds

Seabird Groups and Effects to Consider: For reasons explained in the Steller Sea Lion Protection Measures SEIS (NMFS 2001), the following species or species groups are considered: northern fulmar, short-tailed albatross, spectacled and Steller's eiders, albatrosses and shearwaters, piscivorous seabird species, and all other seabird species not already listed.

The fishery effects that may impact seabirds are direct effects of incidental take (in gear and vessel

strikes), and indirect effects on prey (forage fish and fishery waste) abundance and availability, and benthic habitat (NMFS 2004). ESA listed seabirds are under the jurisdiction of the USFWS, which has completed a hook and line groundfish BiOp (USFWS 1999) and a Pacific halibut fishery BiOp (USFWS 1998). Both BiOps concluded that the groundfish fisheries were unlikely to cause the jeopardy of extinction or adverse modification or destruction of critical habitat for ESA listed birds.

Incidental take The effects of incidental take of seabirds (from fishing gear and vessel strikes) are described in Section 3.7.1 of the PSEIS (NMFS 2004). Birds are taken incidentally in longline (hook and line), trawl, and pot gear. Estimation of seabird incidental take from longline vessels is very straightforward.

As noted in Section 3.7.1 of the PSEIS (NMFS 2004), several factors are likely to affect the risk of seabird incidental catch. It is reasonable to assume that risk goes up or down, partly as a consequence of fishing effort (measured as total number of hooks in the longline fleet) each year (NMFS 2004). In the longline fleet, if seabird avoidance measures used to prevent birds from accessing baited hooks are effective, then effort levels would probably be less of a critical factor in the probability of a bird getting hooked. Seabird bycatch avoidance measures are outlined on pages 3.7-7 through 3.7-10 of the PSEIS (NMFS 2004). New regulations became effective in February 2004. However, a sizeable portion of the longline fleet began, in January 2002, to use the seabird avoidance measures recommended by Washington Sea Grant (Melvin, et al., 2001) and approved by the North Pacific Fisheries Management Council at their December 2001 meeting. While the incidental take of seabirds has exhibited some large inter-annual variations, it is worth noting that the overall take of seabirds was reduced by about 60% from 2001 to 2002. Continued collection of seabird incidental take data by groundfish observers will provide the data necessary to evaluate whether the rates continue to decrease.

Prey (forage fish and fishery waste) abundance and availability A description of the effects of prey abundance and availability on seabirds is in Section 3.7.1 of the PSEIS (NMFS 2004). Detailed conclusions or predictions cannot be made regarding the effects of forage fish bycatch on seabird populations or colonies. However, the present understanding is that fisheries management measures affecting abundance and availability of forage fish or other prey species could affect seabird populations (NMFS 2004), although commercial fisheries do not compete directly with seabirds. There is no directed commercial fishery for those species which compose the forage fish management group, and seabirds typically target juvenile stages rather than adults for those target species where there is an overlap between seabirds and commercial fisheries.

The volume of offal and processing wastes probably changes approximately in proportion to the total catch in the fishery. Whereas some bird populations may benefit from the food supply provided by offal and processing waste, the material also acts as an attractant that may lead to increased incidental take of some seabird species. This impact would need to be considered in the balance of the beneficial and detrimental impacts of the disposal actions.

Benthic habitat The fishery effects on benthic habitat are described in Section 3.6.4 of the PSEIS (NMFS 2004). The indirect fishery effects on benthic habitat as utilized by seabirds are described in the seabird summaries provided in the PSEIS (Sections 4.5.7, 4.6.7, etc. to the PSEIS) (NMFS 2004). The seabird species most likely to be impacted by any indirect gear effects on the benthos would be diving sea ducks such as eiders and scoters as well as cormorants and guillemots (NMFS 2001b). Hook and line gear such as that used in the directed Pacific halibut fishery has limited potential to indirectly affect seabirds via their habitat.

Criteria used to determine significance of effects on seabirds Significance of impacts is determined by considering the context in which the action will occur and the intensity of the action. The significance criteria used for this analysis are similar to the criteria used in the PSEIS (NMFS 2004). Because the action is applied throughout a large portion of the Bering Sea and individual colony impacts are difficult to relate to overall population impacts, the effects on most seabirds are analyzed in terms of impacts on the population in the same manner as analysis in the PSEIS (NMFS 2004). The exceptions are ESA listed eiders which have critical habitat designated. Because critical habitat has been identified for these species, impacts on benthic habitat may be considered at the colony level. Impacts at the colony level for an ESA listed species is more likely to result in impacts on the population level compared to seabirds that are not at population levels that warrant ESA listing. The US Fish and Wildlife Service collects reproduction and population information for selected colonies for many seabird species (USFWS 1998; USFWS 1999). The population trends are specific to the colonies and may or may not be representative of the overall population trend in the BSAI, as population trends for a species in a particular year on several colonies may differ. Because the ESA populations are reduced compared to other seabirds and overall population information is available for ESA listed species, information at the colony level for ESA listed species is more likely to be understood in terms of overall population trends and may be considered for significance criteria for effects that may be localized. Table 4.1-6 outlines the qualitative significance criteria or thresholds that are used for determining if an effect has the potential to create a significant impact on seabirds.

Table 4.1-6 Criteria used to determine significance of effects on seabirds.

Effects	Rating		
	Significant	**Insignificant**	**Unknown**
Incidental take in gear and vessel strikes	Level of take increases or decreases substantially from baseline and/or level of take likely to have population level effect on species.	Level of take similar or less than baseline and/or level of take not likely to have population level effect on species.	Insufficient information available on take rates or population levels.
Prey availability and fishery wastes	Food availability decreased or increased substantially from baseline such that seabird survival or reproduction success is likely to decrease or increase.	Food availability similar to baseline and such that seabird survival or reproduction success is likely not affected.	Insufficient information available on abundance of key prey species or the scope of fishery impacts on prey
Benthic habitat	Impact to benthic habitat decreases seabird prey base substantially from baseline such that seabird survival or reproductive success is likely to increase or decrease.	Impact to benthic habitat similar to baseline such that seabird survival or reproductive success is likely not affected.	Insufficient information available on the scope or mechanism of benthic habitat impacts on food web.

Effects on Marine Benthic Habitat and Essential Fish Habitat Assessment

The PSEIS uses the following criteria to determine significance for habitat:

1. Level of mortality and damage to living habitat;
2. Benthic community diversity;
3. Geographic diversity of impacts.

The reference point, or baseline for purpose of this EA, against which the criteria are applied, is the current size and quality of marine benthic habitat and other essential fish habitat.

Table 4.1-7 Significance Criteria for Habitat

Effect	S-	I	S+	U
Level of mortality and damage to living habitat	Likely to increase substantially from baseline; continued long-term irreversible impacts to long-lived slow growing species	Likely to be similar to baseline	Likely to decrease substantially from baseline	Insufficient information available on baseline habitat data
Changes to Benthic Community Structure	Likely to decrease substantially from baseline	Likely to be similar to baseline	Likely to increase from baseline	Insufficient information available on baseline habitat data
Changes in Distribution of Fishing Effort Geographic Diversity of Management Measures	Likely to decrease substantially from baseline	Likely to be similar to baseline	Likely to increase from baseline	Not applicable

Effects on the Ecosystem

Ecosystem effects evaluated include (1) predator-prey relationships, (2) energy flow and balance, and (3) Diversity. Ecosystem effects involving the Pacific halibut fishery are described in Table 4.1-8

Table 4.1-8 Significance criteria for fishery induced effects on ecosystem attributes.

Issue	Effect	Significance criteria	Indicators
Predator-prey relationships	Pelagic forage availability	Fishery induced changes outside the natural level of abundance or variability for a prey species relative to predator demands	• Population trends in pelagic forage biomass (quantitative)
	Spatial and temporal concentration of fishery impact on forage	Fishery concentration levels high enough to impair the long term viability of ecologically important, non-resource species such as marine mammals and birds	• Degree of spatial/temporal concentration of fishery on forage species (qualitative)
	Removal of top predators	Catch levels high enough to cause the biomass of one or more top-level predator species to fall below minimum biologically acceptable limits.	• Trophic level of the catch • Sensitive top predator bycatch levels (quantitative: sharks, birds; qualitative: pinnipeds) • Population status of top predator species (whales, pinnipeds, seabirds) relative to minimum biologically acceptable limits.
	Introduction of nonnative species	Fishery vessel ballast water and hull fouling organism exchange levels high enough to cause viable introduction of one or more nonnative species, invasive species	• Total catch levels
Energy flow and balance	Energy redirection	Long-term changes in system biomass, respiration, production or energy cycling that are outside the range of natural variability due to fishery discarding and offal production practices	• Trends in discard and offal production levels (quantitative for discards) • Scavenger population trends relative to discard and offal production levels (qualitative) • Bottom gear effort (qualitative measure of unobserved gear mortality particularly on bottom organisms)

Issue	Effect	Significance criteria	Indicators
	Energy removal	Long-term changes in system-level biomass, respiration, production or energy cycling that are outside the range of natural variability due to fishery removals of energy	• Trends in total retained catch levels (quantitative)
Diversity	Species diversity	Catch removals high enough to cause the biomass of one or more species (target, nontarget) to fall below or to be kept from recovering from levels below minimum biologically acceptable limits	• Population levels of target, nontarget species relative to minimum spawning biomass or ESA listing thresholds, linked to fishing removals (qualitative) • Bycatch amounts of sensitive (low potential population turnover rates) species that lack population estimates (quantitative: sharks, birds, HAPC biota) • Number of ESA listed marine species • Area closures
	Functional (trophic, structural habitat) diversity	Catch removals high enough to cause a change in functional diversity outside the range of natural variability observed for the system	• Guild diversity or size diversity changes linked to fishing removals (qualitative) • Bottom gear effort (measure of benthic guild disturbance) • HAPC biota bycatch
	Genetic diversity	Catch removals high enough to cause a loss or change in one or more genetic components of a stock that would cause the stock biomass to fall below minimum biologically acceptable limits	• Degree of fishing on spawning aggregations or larger fish (qualitative) • Older age group abundances of target stocks

4.2 Effects on Target Species

Direct effects on Pacific halibut may occur due to changes in the amount of halibut caught, the time of year it is caught, or the location where the halibut are caught under each of the actions and alternatives. A direct effect of the preferred alternative is to allow Area 4C IFQ and CDQ holders to fish their IFQ and

CDQ in Area 4D. No significant effect is expected because the IPHC considers halibut in Areas 4C-E to be a single stock and finds no biological or conservation basis for separate catch limits in these areas.

The general impacts of fishing mortality are described in Section 3b of the 2004 IPHC Report of Assessment and Research Activities (RARA; IPHC 2005). Additionally, detailed stock assessment and fishery evaluation analyses are prepared for each stock and may be found in the 2004 IPHC RARA (IPHC 2005). Copies of the reports are available online at: http://www.iphc.washington.edu/halcom/pubs/rara/2004rara/2004rara.htm.

The criteria used to estimate the significance of direct and indirect impacts of allowing Area 4C IFQ or CDQ holders to harvest their halibut IFQ or CDQ in Area 4D are summarized in Section 4.1 and in Table 4.1-2. The significance ratings for the target species criteria are summarized in Table 6.0-1. The criteria use a minimum spawning biomass as a basis for positive or negative impacts of each alternative. A thorough description of the minimum spawning biomass calculation can be found in the IPHC's Evaluation of Alternative Harvest Rates for Pacific Halibut (Parma 1992).

Under both alternatives, the stock biomass does not differ because the halibut in Area 4C-E are considered a single stock. The probability that overfishing would occur is low because the actual removals for the stock area will not change. Additionally, redistributing effort from Area 4C to Area 4D would not likely cause localized depletion in Area 4D. There are 5,605 square nautical miles of fishing grounds in Area 4D compared to only 561 square nautical miles of fishing grounds in Area 4C. The IPHC defines fishing grounds as the bottom area covered by plotting the daily fishing locations recorded in logs from the commercial fleet, occasionally supplemented by data from research charters and anecdotal information (Hoag, et al, 1997). The greater availability of fishing grounds in Area 4D reduces the potential of concentrated effort in small areas resulting in localized depletion. Furthermore, any changes that would result from harvest at the levels proposed are not substantial enough to expect that the genetic diversity or reproductive success of these stocks would change. Neither alternative would allow overfishing of the spawning stock, because the minimum spawning biomass for the stock area will not change under both alternatives. Therefore the genetic integrity and reproductive potential of the stock should be preserved.

For these reasons, impacts to the halibut stock in Area 4C-E are predicted to be insignificant for Alternatives 1 and 2. This action is not expected to: (1) jeopardize the capacity of the stock to produce maximum sustainable yield on a continuing basis; (2) alter the genetic sub-population structure such that it jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass; (3) decrease reproductive success in a way that jeopardizes the ability of the stock to sustain itself at or above the minimum spawning biomass; (4) alter harvest levels or distribution of harvest such that prey availability would jeopardize the ability of the stock to sustain itself at or above the minimum spawning biomass; and (5) disturb habitat at a level that would alter spawning or rearing success such that it would jeopardize the ability of the stock to sustain itself at or above the minimum spawning biomass. More detailed information about the biology and distribution of Pacific halibut may be found in the RARA documents described above.

4.3 Effects on Incidentally Caught Species

Indirect effects on other animals may occur if changes in the Pacific halibut fishery result in changes in the incidental catch of other fish, invertebrates, seabirds, or marine mammals. Indirect effects on habitat, including essential fish habitat, may occur as a result of changes in the location of catch or the amount or type of fishing effort employed to catch halibut IFQ or CDQ. The analysis concludes the direct and indirect effects of Alternatives 1 and 2 on incidentally caught species are insignificant.

"Non-specified species" are those species and species groups of no current economic value taken by the groundfish fisheries only as an incidental catch in the target fisheries. Virtually no data exist which would allow population assessments. No record of catch is necessary. The allowable catch for this category is the amount which is taken incidentally while fishing for target and other species, whether retained or discarded." (NPFMC, 2004, page 9).

The non-specified species category contains a huge diversity of species, including invertebrates, that are not defined in the BSAI groundfish FMP as target, other, forage, or prohibited species, except for animals protected under the MMPA or the ESA. The information available for non-specified species is much more limited than that available for target fish species. Estimates of biomass, seasonal distribution of biomass, and natural mortality are unavailable for most non-specified species. Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.6 of the PSEIS (NMFS 2004).

Direct effects include the removal of other species, including non-specified species, from the environment as incidental catch in the halibut fisheries. Indirect effects include habitat disturbance by fishing gear and disruption of food web interactions by disproportionate removal of one or more trophic levels. Insufficient information exists to make quantitative estimates of the effects of changes in the incidental catch of other species. Indicators of ecosystem function relating to non-specified species are summarized in a table at the start of Appendix C to this EA, on "Ecosystems Considerations for 2005."

The reference point against which significance was assessed was the current harvest rate of other and non-specified species. For analytical purposes, this is assumed to be total catch in 2004. The criterion for evaluating significance was whether a substantial difference in incidental catch would occur (+>50% = adverse or - > 50%=beneficial).

Qualitative estimates of the direction of change in other and non-specified species harvests are made assuming that other and non-specified harvests are roughly proportional to target species harvests. Alternatives that constrain target harvests relative to previous harvests, are assumed to reduce other and non-specified species harvests relative previous harvests, those that allow larger harvests are assumed to permit larger harvests of non-specified species. The harvest level under Alternative 1 or Alternative 2 would remain unchanged for the 4C-E management area. Therefore, the impacts on incidentally caught species under Alternatives 1 and 2 has been rated "insignificant," because the harvest level of Pacific halibut under both alternatives does not change.

4.4 Effects on Forage Fish Species

Forage fish are defined as fish eaten by larger predatory fish, seabirds, or marine mammals, usually swimming in large schools.

While non-target species, such as Pacific cod, play a functional role as forage species. Listings of BSAI forage fish species may be found in regulations in Table 2 to 50 CFR §679. The forage fish species categories include, but are not limited to, herring, eulachon, capelin, smelts, lanternfishes, Pacific sand lance, Pacific sand fish, gunnels, pricklebacks, and krill. Many other species occupy similar trophic levels in the food chain to forage fish as species preyed upon by higher trophic levels at some period during their life history, such as juvenile and even adult pollock and Pacific cod.

Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.5 of the PSEIS (NMFS 2004) and the Ecosystems Considerations for 2005 (Appendix C). Surveys for targeted non-forage species conducted by NMFS are not designed to assess the biomass of forage fish species. Estimates of biomass and seasonal distribution of biomass are poor for forage fish species, therefore the effects of different levels of target species harvest on forage fish species are not quantitatively described.

Direct effects include the removal of forage fish species from the environment as incidental catch in the Pacific halibut fisheries. Indirect effects include competition between Pacific halibut (particularly juveniles) and forage fish for available prey. For analysis purposes, the incidental catch is compared to incidental catch that would occur in 2004. The criterion for evaluating significance was a substantial change in incidental catch amount (+>50% = adverse or -> 50%= beneficial).

Indirect effects include habitat disturbance by fishing gear and disruption of food web interactions by disproportionate removal of one or more trophic levels. Insufficient information is available to estimate the indirect effects of changes in the incidental catch of forage species. Even though the amount of biomass and seasonal distribution is unknown for the individual forage fish groups, the small amount of average incidental catch is not likely to affect stocks (abundance) of forage fish species (2004, page 4.9-196). In the BSAI, most of the incidental catch by weight of all forage fish species are smelt, which do not occur as incidental catch in the directed Pacific halibut fishery (Appendix C, page 227).

Qualitative estimates of the direction of change in forage fish species harvests are made assuming that forage fish harvests are roughly proportional to target species harvests. In general, forage species primarily affected by the hook and line halibut fishery includes those species that share similar trophic status, such as Pacific cod and pollock. Alternatives that constrain target harvests, relative to those previous years, are assumed to reduce forage fish harvests relative previous years; those that allow larger target harvests are assumed to allow larger harvests of forage fish. Direct and indirect forage fish impacts are assumed to be correlated with forage fish catches, and thus with target species catches.

Harvest levels under Alternatives 1 and 2 would remain unchanged. Additionally, the gear used in the Pacific halibut fishery tends to select for prey sizes much larger than most forage species. Therefore, Alternatives 1 and 2 have been given an “insignificant” rating.

4.5 Effects on Marine Mammals and ESA Listed Marine Mammals

Marine mammals were considered in two groups: (1) ESA listed Steller sea lions and (2) ESA listed great whales, other cetaceans, northern fur seals, harbor seals, other pinnipeds, and sea otters. The western distinct population segment (DPS) of Steller sea lions and its critical habitat has been determined to be likely to be adversely affected by the groundfish fisheries (FMP BiOp, NMFS 2000a and NMFS 2001). Implementation of the groundfish fisheries must be done in compliance with the Steller sea lion protection measures (68 FR 204, January 2, 2003) to avoid the likelihood of jeopardy of extinction or adverse modification or destruction of Steller sea lion critical habitat. For this reason, particular attention is warranted for Steller sea lions. No other ESA listed marine mammal has been determined likely to be adversely affected by the groundfish fisheries, hence the separate consideration of Steller sea lions from other marine mammals.

Marine Mammal Protection Act

The causes of impacts on marine mammals are difficult to identify and can be controversial. Changes detected in populations may result from impacts by groundfish fisheries or from other causes. Springer, et al. (2003) discuss a possible mechanism that could explain the decline over recent decades in some north Pacific marine mammal species, including seals, sea lions, and sea otters. Their thesis is that industrial whaling in the mid 20th Century may have removed the primary prey (great whales, particularly fin, sei, and sperm) important to killer whales, thus causing killer whales to shift to feeding on smaller marine mammal prey, in a sequential fashion causing a one-by-one collapse in population size of harbor seals, fur seals, sea lions, and most recently sea otters. The scientific community is not unified in acceptance of this hypothesis. But it is a potential factor that may have influenced marine mammal populations in the north Pacific, with the consequence of either absolving fishery activities as possible causes, or reducing marine mammal population sizes to such a low level that they are more susceptible to effects from smaller perturbations. Most scientists and managers would likely agree that there is uncertainty about the ways these various factors interweave and affect the population dynamics of the various species of marine mammals in this region.

The reference point for determining significant impact to marine mammals is whether the proposed harvest levels will impact the current population trajectory of any marine mammal species or result in impacts different from impacts in 2004. Criteria for determining significance are contained in Table 4.1-5. Significance ratings for each question are summarized in Table 6.0-1. The cumulative effects of the alternatives for this action are presented in section 5 of this document.

Incidental Take/Entanglement in Marine Debris

Annual levels of incidental mortality are estimated by comparing the ratio of observed incidental takings that result in mortality to observed groundfish catch (stratified by area and gear type). Incidental bycatch frequencies also reflect locations where fishing effort is highest. In the Bering Sea, takes tend to occur significantly off shore and along the continental shelf. There appears to be no apparent "hot spot" of incidental catch disproportionate with fishing effort. Therefore, estimated incidental take and entanglement, based on estimated harvest levels are appropriate.

Total harvests under both alternatives would be similar to past harvest amounts and are unlikely to result in mortality levels beyond those seen previously. Because mortality amounts are likely to be the same or

less than those experienced in previous years, Alternatives 1 and 2 are not likely to change the population trajectories by more than 10% and are therefore rated as insignificant.

Spatial and Temporal Concentration of Fishery

Spatial and temporal concentration effects on all marine mammals by the groundfish fisheries have been analyzed in the PSEIS. Groundfish fisheries management has been modified to comply with ESA considerations for Steller sea lions (NMFS 2001b). The criteria for an insignificant effect determination are based on the assumptions of the Steller sea lion protection measures analysis and the Section 7 biological opinion that the groundfish fisheries, modified by Steller sea lion protection measures, reduce the impacts and prevent the likelihood of jeopardy of extinction or adverse modification or destruction of critical habitat. The listed and non-listed marine mammals detailed in Table 6.0-2 are not normally taken in hook and line fisheries. The Steller sea lion is the only species recorded as taken incidentally in these fisheries according to records dating back to 1990 (Hill et al., 1997.)

The criterion in this EA also is that other protection areas (Pribilof Habitat conservation area and Walrus protection area) that may benefit marine mammals that are currently in place, remain unchanged. This determination applies to all ESA listed marine mammal species in the affected management areas because this action falls within the scope of the effects analyzed in the 2000 FMP BiOp. The BiOp found that only Steller sea lions were likely to be at risk of jeopardy and adverse modification of critical habitat. With respect to the BSAI groundfish fisheries, the alternatives proposed for the Pacific halibut fishery in the Bering Sea should have a minimal impact on Steller sea lions or other marine mammals.

Under Alternative 2, there would be a potential redistribution of effort to Area 4D and a corresponding decrease in effort in Area 4C. This redistribution could result in a shift of effort from sensitive areas near critical habitat and protected areas to areas farther from shore and less frequently used by Steller sea lions. However, the temporal and spatial concentration of the fishery with respect to the combined 4C-E management area would remain unchanged. Therefore, the spatial and temporal management of the halibut fisheries with respect to the management area would remain the same under Alternatives 1 and 2, resulting in an insignificant rating.

Disturbance Effects

Vessel traffic, hauling gear through the water column, or underwater sound production may all represent perturbations that could affect marine mammal behavior. Foraging could potentially be affected, not only by interactions between vessel and species, but also by changes in fish schooling behavior, distributions, or densities in response to harvesting activities. In other words, disturbance of the prey base may be as relevant a consideration as disturbance of the predator itself. For the purposes of this analysis, some level of prey disturbance may occur as a fisheries effect. The impact on marine mammals using those schools for prey is a function of both the amount of fishing activity and its concentration in space and time, neither of which may be extreme enough under any alternative to represent population level concerns. To the extent that fishery management measures do impose limits on fishing activities inside critical habitat, some protection may be provided from these disturbance effects.

The criterion set for insignificant impacts is a similar level of disturbance as that which was occurring in previous years. The level of disturbance is based on the locations of fishing activities and whether closed areas have been opened. Alternatives 1 or 2 would not open additional areas where disturbance may increase at particular locations. Alternative 1 or 2 would also not increase disturbance based on the

location of fishing activities because fishing would not increase within the combined management Area 4C-E. Thus, the effect under Alternative 1 and Alternative 2 is insignificant according to the criteria set for significance (Table 4.1-6).

The significance determinations for analysis performed in this EA are summarized in Table 6.0-1.

4.6 Effects on Seabirds

Impacts of fishery management on seabirds are difficult to predict due to the lack of information on many aspects of seabird ecology. A summary of known information, both general and species-specific, was presented in the PSEIS, (Section 3.7) and was followed by a description of the comparative baseline to be used for analysis (Sections 3.7.1 and 4.4). An analysis of the effects of each PSEIS alternative on seabirds is provided in sections 4.5 through 4.8 (NMFS 2004).

The criteria used to evaluate the environmental significance of the alternatives' seabird impacts are described in Section 4.1, and summarized in Table 4.1-6. A summary of the significance ratings for the criteria may be found in Table 6.0-1. Significance of impacts is determined by considering the context in which the action will occur and the intensity of the action. Table 4.1-6 outlines the qualitative significance criteria or thresholds that are used for determining if an effect has the potential to create a significant impact on seabirds.

Seabird Groups and Effects to Consider

As discussed in Section 4.1, the following species or species groups are considered: (1) northern fulmar, (2) short-tailed albatross, (3) spectacled and Steller's eiders, (4) other albatrosses and shearwaters, (5) piscivorous seabird species, and (6) all other seabird species not already listed.

Given the sparse information, fishery effects on most individual bird species may not be discernable. The fishery effects that may impact seabirds are (a) direct effects of incidental take (in gear and vessel strikes), and indirect effects on (b) prey (forage fish) abundance and availability, (c) benthic habitat. See Table 4.1-6 in Section 4.1 for a list of the impacts. These are discussed at greater length below.

Incidental take

The effects of incidental take of seabirds (from fishing gear and vessel strikes) are described in Section 3.7.1 of the PSEIS (NMFS 2004). Birds are taken incidentally in longline (hook and line), trawl, and pot gear. Estimation of seabird incidental take from longline gear is very straightforward. The annual bycatch of seabirds has been substantially reduced to the current numbers of about 5,000 birds (NMFS 2004; Figure 111). While seabird bycatch increased in 2003 over 2002, the rate remained constant while effort continued an upward trend (NMFS 2004; Figure 112). Note that a total of 3,835 seabirds were taken in BSAI longline fisheries in 2002. This represents a steady reduction over the last few years, and is a 6-fold decrease in the total number of birds taken from the high of over 24,000 birds in 1998. In the same time frame there has been a 7-fold reduction in the bycatch rate from 0.14 to 0.02 seabirds per 1,000 hooks.

As noted in Section 3.7.1 of the PSEIS (NMFS 2004), several factors are likely to affect the risk of seabird incidental catch. It is reasonable to assume that risk goes up or down, partly as a consequence of fishing effort (measured as total number of hooks in the longline fleet) each year (NMFS 2004). In the

longline fleet, if seabird avoidance measures used to prevent birds from accessing baited hooks are effective, then effort levels would probably be less of a critical factor in the probability of a bird getting hooked. Seabird bycatch avoidance measures are outlined on pages 3.7-7 through 3.7-10 of the PSEIS (NMFS 2004). New bycatch avoidance measures have been required in the hook-and-line groundfish fisheries of the BSAI and GOA since February 12, 2004 (69 *FR* 1930). These regulations required all hook-and-line vessels over 55 feet to use paired streamer lines. Seabird incidental take in 2003 was reduced by 43% from 2001, when many freezer longliners had not yet begun voluntarily using paired streamer lines. Although the incidental take of seabirds has exhibited some large inter-annual variations, it is worth noting that this is the second year of substantive reductions in seabird incidental take when compared to earlier years. Continued collection of seabird incidental take data by groundfish observers will provide the data necessary to evaluate further changes in the rates. Given the apparent reduction in seabird mortalities as a result the use of seabird avoidance gear in combination with recent regulations requiring its use, it is likely that seabird mortalities will continue to decrease or remain stable in the longline fisheries.

Food abundance and availability

A description of the effects of prey abundance and availability on seabirds is in Section 3.7.1 of the PSEIS (NMFS 2004). Detailed conclusions or predictions cannot be made regarding the effects of forage fish bycatch on seabird populations. However, the present understanding is that fisheries management measures affecting abundance and availability of forage fish or other prey species could affect seabird populations (NMFS 2004), although commercial fisheries do not compete directly with seabirds. There is no directed commercial fishery for those species that compose the forage fish management group and seabirds typically target juvenile stages rather than adults for those target species where there is an overlap between seabirds and commercial fisheries.

The volume of offal and processing wastes probably changes approximately in proportion to the total catch in the fishery. Whereas some bird populations may benefit from the food supply provided by offal and processing waste, the material also acts as an attractant that may lead to increased incidental take of some seabird species (NMFS 2001b). These conclusions are based on very limited samples and should be used with caution. It is also worth noting the apparent reduction in seabird incidental take for the longline fleet described earlier. Should the use of seabird avoidance gear prove effective over time, the negative aspects of seabird attraction to vessels will be reduced. Alternatives 1 or 2 would not change the amount of processing waste and offal that is available to scavenging seabirds in the Pacific halibut fishery because the level of harvest does not change.

Benthic habitat

The fishery effects for longlines on benthic habitat are described in Section 3.6.4 of the PSEIS (NMFS 2004). Additional information is provided in section 3.4.3.1.4 of the EFH EIS (NMFS 2005). Indirect fishery effects for longlines on benthic habitat as utilized by seabirds are described in the seabird summaries provided in each alternative (Sections 4.9.7) (NMFS 2004).

Cormorants and alcids have diverse diets that include small schooling fishes (capelin and sand lance) and demersal fish species and crustaceans. These birds are capable of diving from 40 m to over 100 m deep and are thus able to reach the ocean floor in many areas. Some species, such as cormorants and guillemots, usually forage in coastal waters during the breeding season, but other species forage well away from land. Bottom contact gear, including longlines, has the potential to indirectly affect these

diving seabirds via physical changes to benthic habitat through contact with the ocean floor. Fishing gear disturbance as it relates to longline gear can reduce habitat complexity and productivity. (NMFS 2004, page 4.9-241 to 4.9-242) Gear impacts on benthic habitat by longline gear through contact with the bottom are relatively minor compared to other bottom contact gear and contribute relatively little to benthic disturbance. (NMFS 2004, page 4.9-248)

Effects of Alternatives on Seabirds

Incidental take No changes would be made to the seabird avoidance measures currently in place under Alternatives 1 and 2. Incidental takes are expected to be similar those under the baseline because overall harvest would not change in the Area 4C-E management area. Incidental takes of northern fulmars, short-tailed albatross, and black-footed albatross are not expected to change from the baseline under Alternatives 1 or 2. Population level impacts on seabirds are not likely to be different from the baseline, and therefore, the effects on seabirds are insignificant.

Food abundance and availability The PSEIS concluded in the preferred alternative that fishery influences on the abundance and availability of forage fish was considered insignificant for most seabird groups. Alternatives 1 and 2 halibut harvest levels for Area 4C-E do not change from the baseline. The effects of Alternatives 1 and 2 on seabird food abundance are likely to be similar to those under the baseline, because the volume of forage fish removed, and the production of offal is expected to be the same. Seabird survival and reproductive success relative to food abundance and availability are not likely to be different from the baseline, and therefore, the effects on seabirds are insignificant.

Benthic habitat Alternatives 1 and 2 maintain the same methods, locations and amounts of fishing as the baseline fishery. Therefore, the survival and reproductive success of seabirds that may be dependent on the benthic habitat would remain unchanged. Because the impacts on benthic habitat under Alternatives 1 and 2 are likely to be the similar to those in the baseline fishery, the impacts on seabird survival and reproductive success at the population and colony level (for ESA listed species) have been rated insignificant.

4.7 Effects on Marine Benthic Habitat and Essential Fish Habitat

The effects of fishing on benthic habitat and essential fish habitat, important to Federally managed species and their prey, are analyzed in this section. A complete evaluation of effects would require detailed information on the distribution and abundance of habitat types, the life history of living habitat, habitat recovery rates, and natural disturbance regimes. Although more habitat data become available from various NOAA and ADF&G research projects each fishing year, much is still unknown about marine benthic habitat and essential fish habitat in the EEZ. Specific effects for halibut harvest levels, and the magnitude of the differences between them, are very difficult to predict, given the limitations of current data.

Both the PSEIS (NMFS 2004) and the Final EFH EIS (EFH EIS) (NMFS 2005) discuss effects of fishing on habitat. Section 3.6 of the PSEIS discusses the role of particularly sensitive or vulnerable areas and types of EFH, referred to as Habitat Areas of Particular Concern (HAPCs) and outlines the history of fisheries management in protecting EFH. The PSEIS and EFH EIS also include a discussion of the effects of different gear types on EFH and on different types of substrate, and on the past and present effects of fishing on EFH.

The EFH EIS (NMFS 2005) contains different alternatives for identifying and mitigating effects on EFH. A separate EA tiered from the EFH EIS more thoroughly addresses alternative approaches for identifying HAPC. The EFH EIS contains an analysis of the expected effects of each of these alternatives on EFH, as well as other environmental quality factors. Chapter 3 of the EFH EIS describes the affected environment with regard to the Pacific halibut fishery in sections 3.1.2, 3.2.2.2, and 3.3.1. Appendix B of the EFH EIS provides an evaluation of fishing activities that may adversely affect essential fish habitat. This appendix uses a model to incorporate issues of fishing intensity, sensitivity of habitat, and habitat recovery rates into the development of a "unified measure of the resulting effects."(NMFS, 2005, page B-5).

Table 4.1-7 provides significance criteria for effects on habitat. These effects include direct and indirect effects on living habitat through direct mortality of benthic organisms, changes to benthic community structure, and geographic diversity of management and fishing effort. The reference points from which the significance of effects are determined are the current size and quality of marine benthic habitat and other essential fish habitat and the change from the current management of the Pacific halibut fisheries.

The marine habitat may be further altered by changes in the amount and flow of energy with the removal of fish and the return of discard in fisheries. The recipients, locations and forms of discards may differ from those in an unfished system. For the eastern Bering Sea, total catch biomass including non groundfish removals) as a percentage of total system biomass (excluding dead organic material known as detritus) was estimated to be 1% of the total system biomass (Hilborn and Walters 1992). From an ecosystem perspective, total commercial fishing removals are a small proportion of the total system energy budget and are small relative to internal sources of interannual variability in production (NMFS 2000). Energy flow paths do not seem to be redirected by discards and offal. Before improved retention requirements for P. cod and pollock were in place it was estimated that the total offal and discard production was 1% of the estimated unused detritus going to the ocean bottom (Queirolo et al. 1995). Combined evidence regarding the level of discards relative to natural sources of detritus and no evidence of changes in scavenger populations that are related to discard trends suggest that the present groundfish fishery management regime has insignificant ecosystem impacts through energy removal and redirection. (NMFS 2000). Since the Pacific halibut fishery harvests less than 1% of the biomass of the groundfish fisheries in the Bering Sea, it logically has insignificant ecosystem impacts through energy removal and redirection as well.

Auster and Langton (1999) reviewed the indirect effects of commercial fishing on EFH. Studies that they reviewed showed immediate effects of commercial fishing on species composition and diversity and a reduction of habitat complexity. Short-term effects were a good indicator of long-term effects, and recovery was variable depending on habitat type, life histories of component species, and the natural disturbance regime. They also wrote that data are lacking on the spatial extent of commercial fishing-induced disturbance, the effects of specific gear types along a gradient of commercial fishing effort, and the linkages between habitat characteristics and the population dynamics of fishes. Longline gear laid along the sea floor habitat and benthic communities generally has the potential to disturb sea floor habitats by displacing boulders, removing epifauna, decreasing the density of sponges and anthozoans, and damaging echinoderms (NMFS 2005). However, the effect of this disturbance on fish and other living marine resources is not known.

It is reasonable to assume that the Pacific halibut fishery in Area 4C-E may impact the EFH of groundfish caught as bycatch or incidental catch if kept or sold during halibut fishing operations. Insufficient data exists to determine the extent of the actual impacts on such habitat. Much remains to be learned about the habitat requirements of Pacific halibut and associated bycatch species. Additionally, very little

information exists regarding the effects of longlines on benthic habitat (NMFS 2005). No new information has been developed on which NMFS could base additional conservation recommendations that would modify the Area 4C-E halibut fishery to minimize adverse effects from fishing to any practicable extent.

Effects on Essential Fish Habitat

Changes to Living Habitat – Direct Mortality of Benthic Organisms: Longline gear works on the bottom and can have an adverse impact on benthic habitat (see the descriptions of effects of gear on benthic habitats in Section 3.4.3.1.4 of the EFH EIS (NMFS 2005)). The direct mortality on benthic organisms from the directed Pacific halibut fisheries is likely to be affected by the amount of harvest that is permitted. The more harvest permitted, the more activity that is likely to happen in those areas where halibut fishing takes place which may result in additional mortality for benthic organisms in these locations. Alternatives 1 and 2 would maintain harvest levels distributed at the current management regime within Area 4C-E and would have no additional impacts on the direct mortality of benthic organisms than those impacts currently experienced in the Pacific halibut fisheries. Therefore, Alternatives 1 and 2 have been rated as insignificant.

Changes to Benthic Community Structure – Benthic Community Diversity and Geographic Diversity of Management: Harvest levels are not changed under Alternative 1 or 2 with respect to the biological management area recognized by the IPHC, which includes the combined Area 4C-E. Because the harvest and the locations of fishing management levels do not change under Alternatives 1 and 2, the impacts on benthic community structures and the geographic diversity of management measures and fishing effort are considered insignificant.

4.8 Effects on Ecosystems

Ecosystems are populations (consisting of single species) and communities (consisting of two or more species) of interacting organisms and their physical environment that form a functional unit with a characteristic trophic structure (food web) and material cycles (movement of mass and energy among the groups).

The indicators of ecosystem function used to interpret and predict the effects of the BSAI halibut fisheries on the ecosystem are listed in Table 4.1-8. The indicators were separated into categories relating to the three key ecosystem attributes of predator/prey relationships, energy flow/removal, and diversity. Background information specific to the North Pacific ecosystem is contained in Appendix C of this EA ("Ecosystem Considerations for 2005").

Predator-prey relationships

Pelagic forage availability Halibut are opportunistic predators with a wide range of prey species. An increase in prey competition between Pacific halibut and other fisheries catch is not expected. Thus, the directed longline fishery and other state-managed fisheries are not considered contributing factors to changes in prey availability for Pacific halibut. Long-term climate changes and regime shifts could have impacts on certain prey species of Pacific halibut depending on the direction of the shift. It has been shown that warm trends favor recruitment while cool trends weaken recruitment in most fish species; however, the effects of this type of large-scale event on the prey structure of halibut cannot be determined at this time. However, harvest levels under Alternatives 1 and 2 remain unchanged. Therefore, the

likelihood that predator-prey relationships would change remains remote, resulting in an insignificant rating for Alternatives 1 and 2.

Spatial and temporal The spatial and temporal concentration of fishery impacts on forage species is assessed qualitatively by considering the potential for the alternative to concentrate fishing on forage species in regions used by predators tied to land, such as pinnipeds and breeding seabirds. Additionally, the possibility for concentrated fishing effort to result in an ESA listing or in the lack of recovery of a species that is already listed must also be considered.

Alternatives 1 and 2 would both continue the existing closures around Steller sea lion rookeries, trawl and fixed gear closures in nearshore and critical habitat areas and the seabird protection measures required since February 2004 in hook-and-line fisheries. Additionally, Alternative 1 and Alternative 2 do not change total harvests and there is no change in spatial or temporal controls with respect to the existing management regime. Since there is no change in total harvest or spatial or temporal controls, it is unlikely that fishing effort will result in an ESA listing or in the lack of recovery for a listed species. Therefore, Alternatives 1 and 2 are rated as insignificant with respect to spatial and temporal concentration of fishery impacts on forage species.

Removal of top predators The significance criterion for removal of top level predators is whether or not catch levels are high enough to cause the biomass of one or more top level predator species to fall below minimum biologically acceptable limits. Removal of top predators, either through directed fishing or bycatch, is assessed by (1) an examination of the trophic level of the catch or bycatch, (2) the bycatch levels of sensitive top level predators, and (3) the population status of top predator species relative to acceptable limits. (Section 4.1, Table 4.1-8) The PSEIS elaborates somewhat on the ways these indicators are meant to be evaluated:

> *Removal of top predators, either through directed fishing or bycatch, is assessed by evaluating the trophic level of the catch relative to the trophic level of the groundfish biomass…, bycatch levels of sensitive top predator species such as birds and sharks…, and a qualitative evaluation of the potential for catch levels to cause one or more top-level predator species to fall below biologically acceptable limits. (NMFS, 2004, page 4.9-353)*

Due to an absence of specific data on the subject, the Pacific halibut fisheries must be observed with reference to the groundfish fisheries as described in the PSEIS. The PSEIS points out that trophic level of the catch in both the BSAI and GOA have been stable. (NMFS 2004, 4.9-353). In 1999, Livingston *et al.* "found no evidence that groundfish fisheries had caused declines in tropic guild diversity for the groups studied." Observed changes in tropic guild diversity appeared to be "related primarily to recruitment rather than to fishing." (NMFS, 2004, page 3.10-26) More recently, as noted in this year's ecological SAFE, which may be found in Appendix C, "Stability in the trophic level of the total fish and invertebrate catches in the eastern Bering Sea, Aleutian Islands, and Gulf of Alaska…are another indication that the "fishing-down" effect is not occurring in these regions. Although there has been a general increase in the amount of catch since the late 1960's in all areas, the trophic level of the catch has been high and stable over the last 25 years." The Appendix also reports on a "Fishery in Balance Index" or FIB, which declines "when catches do not increase as expected when moving down the food web, relative to an initial baseline year. In the Alaska region, the index suggests that "…catches and tropic level of the catch in the EBS, AI, and GOA have been relatively constant and suggest an ecological balance in the catch patterns." (Appendix C, page 166) This indicator is rated insignificant for Alternative 1 and 2 because total harvest

in the management Area does not increase, thereby resulting in no additional removals of top-level predators.

The above indicators result in no change in the evaluation of this effect relative to the baseline. The baseline determination shows that historical whaling has resulted in low present-day abundance of whale species in the North Pacific Ocean. Alternatives 1 and 2 would not further impair the recovery of these species through direct takes. Similarly, it is not expected that levels of seabird or pinniped bycatch in the Pacific halibut fishery would lead to an ESA listing for any of those populations or prevent any of the listed species from recovery under the ESA.

Bycatch levels of top-level predators are assumed to vary with catch levels, and thus with the Pacific halibut harvest levels that constrain catches. Alternatives 1 and 2 do not change the current halibut harvest level in management Area 4C-E and have been rated insignificant with respect to this indicator.

Section 4.5 of the EA examined the impacts of Pacific halibut fishery incidental takes of marine mammals and found the impact of Alternatives 1 and 2 to be insignificant. Section 4.6 examined the impacts on incidental takes of seabirds, and found an insignificant effect for all species. The effect of shark bycatch on shark populations is currently unknown, and further research focusing on population assessments and establishing reliable biomass estimates for these sensitive (late maturing, low fecundity, low natural mortality) species is needed to identify potential effects from the Pacific halibut fisheries.

Insignificant marine mammal impacts, insignificant seabird impacts, and the unknown impacts of the fishery shark bycatch on shark populations, lead to an insignificant overall rating for both Alternatives 1 and 2.

Introduction of non-native species The introduction of non-native species through ballast water exchange and hull-fouling organism release from fishing vessels could potentially disrupt the Alaskan marine food web structure. There have been 24 non-indigenous plant and animal species documented in Alaskan marine waters, primarily in shallow-water nearshore and estuarine ecosystems. It is possible that most of these introductions were from tankers or other large commercial vessels that have large volumes of ballast exchange. However, exchange via fishery vessels that take on ballast from areas where invasive species have already been established and then transit through Alaskan inshore waters has been identified as a threat in a recently developed State of Alaska Aquatic Nuisance Species Management Plan. (NMFS, 2004, 4.9-354)

Total harvest levels are used as an indicator of potential changes in the amount of these releases by Pacific halibut fishery vessels. Harvest levels in the Bering Sea management Area 4C-E neither increase nor decrease beyond recent levels under Alternative 1 or Alternative 2. Additionally, most vessels in the region are less than 60 feet and do not require significant amounts of ballast. Consequently, Alternative 1 and Alternative 2 have been rated as insignificant.

Energy flow and removal

Energy removal Fishing may alter the amount of energy in an ecosystem by removing energy through the retained harvest of fish. The indicator for energy removal is trends in total retained catch levels. (See Section 4.1, Table 4.1-8). The PSEIS notes “The annual total catch biomass in the EBS is estimated at about one percent of the total system biomass, excluding dead organic material. There is no indication that the annual removal of this small biomass percentage alters the amount and flow of energy sufficiently

to affect ecosystem stability." (NMFS, 2004, page 3.10-24). Annual total catch biomass in the Pacific halibut fishery in the Bering Sea is less than 1% of the corresponding groundfish annual total catch biomass. Therefore, the removal of the small biomass of Pacific halibut is equally unlikely to alter the amount and flow of energy sufficiently to affect ecosystem stability.

Total retained catch mortality is not projected to increase under Alternative 1 or Alternative 2. Given the limited potential for impacts on the ecosystem this indicator has been rated insignificant for Alternatives 1 and 2.

Energy re-direction Fishing may alter the direction of energy flow in an ecosystem. Energy re-direction, in the form of discards, fishery offal production, or unobserved gear-related mortality, can potentially change the natural pathways of energy flow in the ecosystem. The recipients, locations, and forms of this returned biomass may differ from those in an unfished system. Three factors: (1) trends in discard and offal production, (2) scavenger population trends, and (3) bottom gear effort, were identified as formal indicators of energy redirection in Section 4.1, Table 4.1-8. Discards and offal production can cause local enrichment and changes in species composition or water quality if discards or offal returns are concentrated in confined areas such as estuaries, bays, and lagoons. (NMFS, 2004, 4.9-355)

Bottom gear effort may affect benthic habitat, and its capacity to support marine fish and invertebrates that use the habitat for protection from predators. Because of this the use of bottom gear may be an indicator of the potential for this source of energy redirection. The PSEIS notes that "Present-day trends in bottom gear effort show there has been a decline in this effort over the last ten or more years." (NMFS 2004, page 3.10-25).

Given the limited significance of the offal production and scavenging in the ecosystem, the impacts of Alternatives 1 and 2 have been rated insignificant with respect to the first two indicators. Additionally, neither Alternative 1 nor Alternative 2 would result in an increase in bottom gear effort, resulting in an insignificant rating for that indicator and an insignificant rating overall.

Diversity

Species diversity Species diversity, defined as the number of different species in an ecosystem, can be altered if fishing results in removal of one or more species from the system . An impact on species diversity is significant if catch removals are high enough to cause the biomass of one or more species (target or nontarget) to fall below or to be kept from recovering from levels below minimum biologically acceptable limits. The indicators for species diversity are: (1) population levels of target and non-target species relative to MINIMUM SPAWNING BIOMASS or ESA listing thresholds, linked to fishing removals, (2) bycatch amounts of sensitive (low potential population turnover rates) species that lack population estimates, (3) number of ESA listed marine species, and (4) area closures. (Section 4.1, Table 4.1-8).

Population levels of target, other and non-specified, and forage species were addressed in Sections 4.2, 4.3, 4.4, and 4.5 of this EA. The impacts on target species were rated insignificant for Alternatives 1 and 2. The impacts on other, non-specified, and forage fish species were insignificant for Alternatives 1 and 2. Summarizing these results for this ecosystem indicator, Alternative 1 and Alternative 2 are rated insignificant.

Although no fishing-related species removals have been documented under fisheries management policies in effect during the last 30 years, elasmobranches (sharks, skates, and rays) are particularly susceptible to removal. (NMFS, 2004, page 3.10-26) More comprehensive survey data and life history parameter determinations for skates, sharks, grenadiers, and other species groups may help to determine population status and establish additional protection measures that could minimize adverse impacts from fishing. (NMFS, 2004, page 4.9-356). Therefore, alternatives 1 and 2 are rated as unknown with respect to this impact.

Table 6.0-2 identifies the ESA listed and candidate species that range into the BSAI or GOA groundfish management areas. As determined in previous ESA consultation BiOps (NMFS 2000, 2001a, and USFWS 2003), the alternatives under consideration in this EA are not expected to change the number of ESA marine species, or the status of existing ESA listed species. Therefore, harvest levels under Alternatives 1 and 2 are rated insignificant with respect to this impact.

Under all the alternatives, currently closed areas (50 CFR 679.22) would be maintained, and current fixed-gear restrictions would stay in place. Alternatives 1 and 2 have been rated insignificant with respect to this impact.

In summary, Alternative 1 and Alternative 2 are rated insignificant.

Functional (trophic, structural habitat) diversity Functional diversity can be altered with respect to trophic characteristics if removal or depletion of a trophic guild member occurs. Changes to distribution of biomass within a trophic guild may also result. From a structural habitat standpoint, functional diversity can be altered or damaged if benthic fishing methods remove or deplete organisms that provide structural habitat for other species (e.g., corals, sea anemones, sponges). Functional (either trophic or structural habitat) diversity can be altered through fishing if selective removal of one member of a functional guild results in increases in other guild members. A functional guild is a group of species that utilize resources within the ecosystem in similar ways. (NMFS, 2004, 4.9-355 to 4.9-356) Significance thresholds are characterized by catch removals resulting in a change in functional diversity outside the range of natural variability observed for the system. Three indicators are used with respect to functional diversity: (1) guild diversity or size diversity changes linked to fishing removals, (2) bottom gear effort, and (3) HAPC biota bycatch. (Section 4.1, Table 4.1-8)

In 1999, Livingston *et al.* "found no evidence that groundfish fisheries had caused declines in trophic guild diversity for the groups studied." Observed changes in tropic guild diversity appeared to be "related primarily to recruitment rather than to fishing." (NMFS, 2004d, page 3.10-26) More recently, as noted in this year's ecological SAFE, which may be found in Appendix C, "Stability in the trophic level of the total fish and invertebrate catches in the eastern Bering Sea, Aleutian Islands, and Gulf of Alaska…are another indication that the "fishing-down" effect is not occurring in these regions. Although there has been a general increase in the amount of catch since the late 1960's in all areas, the trophic level of the catch has been high and stable over the last 25 years." The Appendix also reports on a "Fishery in Balance Index" or FIB, which declines "when catches do not increase as expected when moving down the food web, relative to an initial baseline year. In the Alaska region, the index suggests that "…catches and tropic level of the catch in the EBS, AI, and GOA have been relatively constant and suggest an ecological balance in the catch patterns." (Appendix C, page 166) This indicator is insignificant for Alternative 1 and Alternative 2, under which total harvests remain at recent levels.

Bottom gear effort, which is an indicator of benthic community guild disturbance, has been decreasing in recent years. (NMFS, 2004, page 3.10-26). This indicator has been rated insignificant for Alternatives 1 and 2, which leave harvests at recent levels.

Members of the HAPC biota guild serve important functional roles in providing fish and invertebrates with structural habitat and refuge from predation. The abundance level of these structural species necessary to provide protection is not known, and it may be important to retain populations of these organisms and maintain wide spatial distribution to enable them to fulfill their various functional roles. Some of these organisms have life-history traits that make them very sensitive to population-level impacts resulting from fishing. The long-lived nature of corals, in particular, makes them susceptible to permanent eradication in fished areas. This indicator has been rated insignificant for Alternatives 1 and 2, because harvest levels under both alternatives remain unchanged.

Genetic diversity An impact on genetic diversity would be significant if catch removals were high enough to cause a loss or change in one or more genetic components of a stock that would cause the stock biomass to fall below minimum biologically acceptable limits. Indicators for this effect are: (1) degree of fishing on spawning aggregations or larger fish, and (2) older age group abundances of target groundfish stocks. Changes in these indicators are assessed qualitatively by inferences from changes in catch levels and in regulations protecting spawning aggregations and separate biomass concentrations.

If a fishery concentrates on certain spawning aggregations or on older (larger) age classes of a target species that tend to have greater genetic diversity (dating from an earlier period when fishing was less intensive), then genetic diversity will tend to decline in fishing versus unfished systems. Since genetic diversity has not been systematically surveyed, there is no baseline against which changes in genetic diversity may be measured. There are examples (i.e., North Sea cod) of fisheries in which heavy fishing, and selection for body length, over long periods of time have been found to have little impact on genetic diversity. It is unknown if commercial fishing has altered the genetic diversity of stocks with distinct genetic components at finer spatial scales than the present IPHC management areas.

Alternative 1 and Alternative 2 would maintain current harvest levels and would not alter spatial and temporal management controls that provide existing protection for spawning stocks and for overexploitation of subdivisions of broader regional stocks. Alternative 1 and Alternative 2 would not be expected to have an adverse impact on genetic diversity because Pacific halibut in Area 4 are considered one stock. Therefore, both alternatives have been rated insignificant.

5.0 Cumulative Effects

5.1 Cumulative effects, the PSEIS, and Pacific halibut

NEPA requires that environmental assessments analyze the potential cumulative effects of a proposed action and its alternatives. An environmental assessment or environmental impact statement must consider cumulative effects when determining whether an action significantly affects environmental quality. The CEQ regulations for implementing NEPA define cumulative effects as:

> the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or nonfederal) or person undertakes such other actions. Cumulative

effects can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7)

Cumulative effects in the directed fishery for Pacific halibut are analogous to the cumulative effects applicable to the groundfish fisheries because both fisheries employ hook and line gear in the same affected environment. Cumulative effects of the groundfish fisheries are thoroughly analyzed in the final PSEIS in Chapter 4.0 (NMFS 2004). Section 4.1.4 describes the methodology used in the cumulative effects analyses, and in section 4.9 and the accompanying tables in Appendix A, groundfish management under the Preferred Alternative is analyzed for effects on the environment, including cumulative effects for each component of the environment. See section 4.9 of the PSEIS for further details on the cumulative effects of the Preferred Alternative. The PSEIS evaluates the direct, indirect, and cumulative effects of the groundfish fisheries through the period 2001-2002 (NMFS, 2004, Volume I, page 3.1-3).

The cumulative effects analysis takes the latest period analyzed in the PSEIS, 2001-2002, as its baseline, and examines effects of events and actions that have taken place since that time, and of future events and actions, which are currently reasonably foreseeable. Past actions are actions or events that occurred or were finalized, after the 2002 PSEIS analysis, such as final regulatory amendments or bycatch harvest amounts. Future actions are those that are in process either by proposed rule making, or are currently being developed through research activities or Council committees and have been addressed by the Council during one or more meetings.

5.2 Past Actions

Changes in regulations since the baseline

A number of final rules have been implemented by NMFS since the baseline for analysis in the PSEIS. Each action was analyzed under NEPA for its impacts on the human environment. Copies of all final rules and the associated analyses are available on the NMFS Alaska Region website at www.fakr.noaa.gov. Two important actions were finalized after January 2002, but implemented by emergency rule in 2001 and 2002: the Steller sea lion protection measures (68 FR 204, January 2, 2003) and the American Fisheries Act program (67 FR 79692, December 30, 2002). Because these were implemented by emergency rule in 2001 and 2002, their impacts were included in the PSEIS analysis and are part of the baseline for the PSEIS. Many of the final rules since January, 2002, implement administrative changes, observer program changes, recordkeeping and reporting changes, or corrections and have no effect on the Bering Sea groundfish or Pacific halibut fisheries. A few of these actions have affected the management aspects of the groundfish fisheries or Pacific halibut fisheries in ways that were not analyzed in the cumulative effects analysis of the PSEIS and may need to be further considered in this EA. These are listed in Table 5.2-1 below.

Table 5.2-1 Regulatory and FMP Amendments completed since the PSEIS

Action	Federal Register Citation	Effective Date
CDQ Other Species Management	68 FR 69974, December 16, 2003	January 15, 2004
2004 List of Fisheries for Marine Mammal Protection	69 FR 48407, August 10, 2004	September 9, 2004
Seabird Longline Avoidance Measures	69 FR 1930; January 13, 2004	February 12, 2004
Amendment 48/48 to GOA and BSAI harvest specifications process	69 FR 64683, November 8, 2004	December 8, 2004
Amendment 81/74, ecosystem management policy	Record of Decision August 26, 2004	August 26, 2004
Subsistence Halibut Fishery Policy for waters in and off Alaska	68 FR 18145, April 15, 2003	May 15, 2003
Modification of the Area 4 Catch Sharing Plan to allow CDQ Program participants to harvest allocations of Area 4D halibut CDQ in Area 4E.	68 FR 9902, March 3, 2003	April 2, 2003

CDQ program other species management

In December 2003, NMFS issued a final rule to modify the management of the ‘‘other species’’ Community Development Quota (CDQ) reserve by eliminating specific allocations of ‘‘other species’’ CDQ to individual CDQ managing organizations (CDQ groups) and, instead, allowing NMFS to manage the ‘‘other species’’ CDQ reserve with the general limitations used to manage the catch of non-CDQ groundfish in the BSAI. This action also eliminated the CDQ non-specific reserve and made other changes to improve the clarity and consistency of CDQ Program regulations.

This action was necessary to improve NMFS's ability to effectively administer the CDQ Program, allowing for more complete harvest of target species that had been constrained by individual allocations of "other species" quota. This action modifies the impact of the harvest specifications by facilitating the full harvest of the target species quota in the CDQ program and by changing the way the "other species" TAC as a whole (CDQ plus non-CDQ catch) is managed. The impacts from the alternatives in this analysis are based on the assumption of fully harvesting the quotas, and, therefore, the CDQ "other species" final rule action is not likely to have any additional effects that need to be considered in this EA.

List of Fisheries

In August 2004, NMFS published a final List of Fisheries (LOF) for 2004, as required by the Marine Mammal Protection Act (MMPA), reflecting new information on interactions between commercial fisheries and marine mammals. In this LOF, NMFS categorizes each commercial fishery into one of three categories under the MMPA, based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery. The categorization of a fishery in the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take-reduction plan requirements.

The listing of the Alaska groundfish fisheries was changed in 2004, to be specific to a target species, rather than combining all fisheries in one gear type in an area. Through 2004, all groundfish fisheries are Category III fisheries, based on the annual marine mammal mortality in each fishery, which mortality is expected to be less than or equal to one percent of the potential biological removal level for each marine

mammal species. NMFS has published a proposed rule under which selected groundfish fisheries would be assigned to Category II. This proposal is discussed below, under reasonably foreseeable future actions.

The Pacific halibut fisheries continue to be classified as Category III fisheries.

Longline seabird avoidance measures

On January 13, 2004, NMFS issued a final rule requiring seabird avoidance measures in the BSAI and GOA hook-and-line groundfish fisheries and in the Pacific halibut fishery in U.S. Convention waters off Alaska (69 FR 1930; January 13, 2004; effective February 12, 2004). This action is intended to improve the current requirements and further mitigate interactions with the shorttailed albatross (Phoebastria albatrus), an ESA listed endangered species, and with other seabird species in hook-and-line fisheries off Alaska. Details on the 6-fold decrease in seabird bycatch in the BSAI and GOA fisheries due to the avoidance measures is in Appendix C, page 204.

GOA and BSAI FMP Amendments 48/48

NMFS has published a final rule to implement Amendments 48/48 to the groundfish FMPs and, thus, revise the harvest specifications process. The goals in revising the harvest specifications process are to: (1) manage fisheries based on the best scientific information available, (2) provide for adequate prior public review and comment to the Secretary on Council recommendations, (3) provide for additional opportunity for Secretarial review, (4) minimize unnecessary disruption to fisheries and public confusion, and (5) promote administrative efficiency. This final rule has no major changes to fishing practices nor to total allowable harvest amounts and management measures, only administrative changes to the process of setting harvest specifications.

Ecosystem Management Policy

In August 2004, Amendments 81/74 for the groundfish FMPs were approved. These FMP amendments revise the management policies, goals, and objectives for the groundfish fisheries. The goals and objectives provide for a new ecosystem-based management framework that serves as the management policy for the groundfish fisheries into the future. These amendments were based on the preferred alternative in the PSEIS.

Subsistence Halibut Program

NMFS issued a final rule to authorize and manage a subsistence fishery for Pacific halibut in waters in and off Alaska. This action allowed qualified persons to practice the long-term customary and traditional harvest of Pacific halibut for food in a non-commercial manner. Because the action legitimized a currently existing practice and did not create a new allocation, the Subsistence Halibut Policy is not likely to have any additional effects that need to be considered in this EA.

Revision to Area 4 CSP Allowing Area 4D CDQ to be harvested in Area 4E

NMFS issued a regulatory amendment modifying the Area 4 CSP to incorporate the Council's specific recommendation that Area 4D halibut CDQ may be harvested either in Area 4D or in Area 4E. This modification was intended to allow Area 4D CDQ holders who normally must travel extended distances offshore to harvest Area 4D halibut CDQ to harvest their Area 4D CDQ in Area 4E. This action also

allowed CDQ holders to more safely harvest their quota from small local vessels rather than allow the quota to be harvested by large, non-local vessels. This action provides precedent for the current action and was supported under the same premise that the IPHC considers the Area 4C-E halibut stock a single stock. Based on the reasoning that Area 4C-E maintains a single stock, the previous revision to the Area 4 CSP is not likely to have any additional effects that need to be considered in this EA.

5.3 Reasonably foreseeable future actions

The following is a list of reasonably foreseeable future actions that could affect both the groundfish and Pacific halibut fisheries in the Bering Sea. These actions are either in the final rulemaking stages or are in development and have been recognized as necessary by either NMFS or the Council. For items currently under development, it may be possible to only determine the nature of the potential effect, either positive or negative on an environmental component because there is not enough information at this time to determine significance. Table 5.3-1 contains substantial actions and proposals scheduled for review by the Council or for proposed or final action by NMFS in the near future.

Table 5.3-1 Reasonably Foreseeable Future Actions

Action	Expected Date of Implementation
Subsequent harvest specifications	Annually into the future
Essential Fish Habitat and HAPC Management Amendments 78/73	Effective by August 13, 2006 by court order
Fur seal management	EIS for subsistence harvest scheduled for 2005 Conservation Plan draft scheduled for early 2005
Trawl seabird avoidance measures	Post 2006
List of Fish Category change proposals	2005

Subsequent annual specifications

The cumulative effects of small incremental changes in annual TACs and how they relate to halibut incidental catch are not discernable on a year-to-year basis. However, NMFS expects that over time any cumulative effects may become apparent through the annual cumulative effects analysis for the harvest specifications.

Essential Fish Habitat and Habitat Areas of Particular Concern

The Council is currently in the process of amending the FMPs to identify essential fish habitat (EFH) and habitat areas of particular concern (HAPCs) and to identify measures to protect habitat generally and allow a more focused application of protection measures to those habitat areas most sensitive to impact.

In January 2005, NMFS published the EFH EIS evaluating alternatives for three actions: (1) describing EFH for fisheries managed by the Council; (2) adopting an approach for the Council to identify HAPCs within EFH; and (3) minimizing to the extent practicable the adverse effects of Council-managed fishing on EFH (NMFS 2004a). The EFH EIS discusses the effects of these actions and their alternatives on habitat, target species, the economic and socioeconomic aspects of Federally managed fisheries, other fisheries and fishery resources, protected species, ecosystems and biodiversity, and non-fishing activities.

The Council has taken final action on both the EFH EIS and the HAPC EA as of February 2005 (NPFMC 2005).

Fur seal management

The northern fur seal inhabits the North Pacific Ocean and occupies the Pribilof Islands and Bogoslof Island during the summer/fall breeding season. Fur seals are harvested by subsistence hunters of the Aleut communities of St. Paul and St. George Islands, and this subsistence harvest is managed cooperatively by NMFS and the Tribal Governments of St. Paul and St. George. The northern fur seal population in the Pribilofs has been declining, with pup production between 2002 and 2004 down 15.7 percent on St. Paul and 4.1 percent on St. George.

In June 2003 the Council appointed a Fur Seal Committee to monitor preparation of the draft EIS for subsistence harvest and to make recommendations for further Council action. The draft EIS may be viewed at http://www.fakr.noaa.gov/protectedresources/seals/fur.htm. The draft EIS has identified conditional significantly adverse cumulative effects from the groundfish fisheries based on the significance criteria use in the EIS. Continued concern for fur seals and potential interaction with the groundfish and Pacific halibut fisheries may result in the implementation of additional protection measures.

Seabirds

In the trawl fisheries, research is currently underway to address seabird interactions with trawl fisheries. A September 2003 Biological Opinion issued by the USFWS identifies this issue as needing additional study and requires NMFS to develop a means to assess these interactions and recommends the developments of methods to minimize seabird collisions with trawl wires. Appendix C has more details on trawl fisheries seabird bycatch. A pilot project for electronic monitoring of seabird interactions with the third-wire cable was completed in 2002, analyzing an additional method of collecting bird interaction information besides the use of observers. (McElderry, et al. 2004). A collaborative project with industry, AFSC, USFWS, and the University of Washington will test mitigation measures to reduce seabird interactions with trawl sonar transducer cables. Protection measures based on the results of the research are not likely to be implemented until after 2005.

2005 List of Fisheries

The proposed rule for the 2005 List of Fisheries (LOF) for purposes of marine mammal protection was published December 2, 2004 (69 FR 70094). NMFS has completed an analysis of past incidental mortality and serious injury for each of the Federal fisheries specified in the 2004 LOF.

Based on these analyses, NMFS proposes that five of the Federal fisheries be reclassified as Category II fisheries and the remainder of the fisheries are Category III. The fisheries proposed to be reclassified from Category III to Category II are: Bering Sea Aleutian Islands flatfish trawl, Bering Sea Aleutian Islands Pollock trawl, Bering Sea Aleutian Islands Greenland Turbot longline, Bering Sea Aleutian Islands Pacific Cod longline, and Bering Sea Sablefish pot.

Fisheries in Category II are required to register with NMFS, take a marine mammal observer if asked, and must comply with any take reduction plan if one exists. The final rule for the LOF will likely be

completed in mid 2005. If the proposed reclassifications are made final, the Category II fisheries will be subject to additional scrutiny regarding marine mammal interactions compared to Category III fisheries.

Halibut and Sablefish IFQ Program Amendments

The Council approved one suite of administrative changes and initiated analysis on a second set of administrative changes for the Halibut and Sablefish IFQ program during 2004-2005. Except for a provision to allow the use of pot longline gear in the Bering Sea sablefish fishery, which would have a potential effect on marine mammals and benthic habitat through gear interactions, the remainder of the provisions are administrative in nature and would have no effect on the degree or intensity of harvest in the Pacific halibut or sablefish fisheries.

Subsistence Halibut Program Amendments

In October 2003, the Council recommended changes to the existing Subsistence Halibut regulations (Subsistence II) that more narrowly tailor gear and harvest limitations to specific areas. With respect to this EA, the regulatory changes in Subsistence II, which should become effective in the summer of 2005, would relieve existing gear restrictions and allow the retention of subsistence halibut harvested along with commercially caught CDQ halibut in Areas 4C, 4D, and 4E. The remainder of the changes recommended in Subsistence II would not affect the Bering Sea Pacific halibut fishery.

5.4 Cumulative effects analysis

Cumulative effects analysis requires assessment of additive impact of past effects that have a continuing and additive impact, direct and indirect effects of the proposed action, and reasonably foreseeable future effects. Direct and indirect impacts of the action on ten resource categories were analyzed in Chapter 4. The resource categories included target species, non-specified species, forage fish species, marine mammals, seabirds, habitat, ecosystem impacts. This section reviews the resource categories identified in Chapter 4 for such past and future effects, applies the significance criteria for each environmental component, and limits the analysis to the cumulative effects added to the direct and indirect effects from the preferred alternative (alternative 2). Tables 5.4-1 and 5.4-2 below show the past and foreseeable future actions and the environmental components that may be affected. The following discussion explores the significance of the potential effects.

Table 5.4-1 Past actions and type of effect on environmental components.

	Target	Other and Non-specified	Forage	Marine mammals	Seabirds	Habitat	Ecosystem
Changes in Pacific halibut stock assessments and catch limits since 2002	Harvest consistently at or below catch limits established by IPHC. No effect.	Harvest consistently at or below catch limits established by IPHC. No additional effect.	Harvest consistently at or below catch limits established by IPHC. No additional effect.	Harvest consistently at or below catch limits established by IPHC. No additional effect.	Harvest consistently at or below catch limits established by IPHC. No additional effect.	Harvest consistently at or below catch limits established by IPHC. No additional effect.	Harvest consistently at or below catch limits established by IPHC. No additional effect.
Changes in amount of total directed groundfish harvest compared to annual TAC total since 2002	Amount of harvest consistently at or below the amount planned for including adjustments each year for past harvest. No Effect	Consistency in past harvests at or below planned levels provides no additional effect.	Consistency in past harvests at or below planned levels provides no additional effect.	Consistency in past harvests at or below planned levels provides no additional effect.	Consistency in past harvests at or below planned levels provides no additional effect.	Consistency in past harvests at or below planned levels provides no additional effect.	Consistency in past harvests at or below planned levels provides no additional effect.
Longline seabird measures	No effect	No effect	No effect	No effect	Positive effect by reducing longline bycatch of seabirds	No effect	Positive effect by reducing longline catch of top level predator
Amend 81/74, Ecosystem policy	Improved management by applying ecosystem principals	Improved management by applying ecosystem principals	Improved management by applying ecosystem principals	Improved management by applying ecosystem principals	Improved management by applying ecosystem principals	Improved management by applying ecosystem principals	Improved management by applying ecosystem principals
Other species CDQ reserve	No effect	No effect	No effect	No effect	No effect	No effect	No effect
LOF	No effect	No effect	No effect	Better marine mammal protection	No effect	No effect	Better marine mammal protection
Subsistence Halibut Program	Legitimized a currently existing practice. No effect.	No effect	No effect	No effect	No effect	No effect	Improved management through better stock assessment
Revision to Area 4CSP	No change in harvest in the management area. No effect.	No effect	No effect	No effect	No effect	No effect	Improved management through better stock assessment

Table 5.4-2 Reasonably foreseeable future actions and type of effect on environmental components.

	Target	Other and Non-specified	Forage	Marine mammals	Seabirds	Habitat	Ecosystem
Future Pacific halibut stock assessments and catch limits	Continued removals at or below current removals. No effect.	May be beneficial as catch limits decline with cyclical recruitment patterns.	May be beneficial as catch limits decline with cyclical recruitment patterns.	May be beneficial as catch limits decline with cyclical recruitment patterns.	May be beneficial as catch limits decline with cyclical recruitment patterns.	May be beneficial as catch limits decline with cyclical recruitment patterns.	Potential for range of impacts described in Section 4.8
Future Harvest Specifications	Continued bycatch within scope of Amendments 81/74	Continued bycatch within scope of Amendments 81/74	Continued bycatch within scope of Amendments 81/74	Potential for incidental take, competition for prey, disturbance, within scope of Amendments 81/74	Potential for take, competition for prey, impacts to benthic habitat, within scope of Amendments 81/74	Potential adverse effect for long-lived slow growing species and changes in benthic community structure	Potential for range of impacts described in Section 4.8, within scope of Amendments 81/74
EFH/HAPC	May be beneficial Pacific halibut stocks by protecting EFH	May be beneficial if also protect areas used by non specified species	May be beneficial if also protect areas used by forage species	May result in improved foraging	May result in improved foraging	Better protection for habitat features	Better protection for functional diversity
Fur Seal Management	No effect	No effect	No effect	Improved protection	No effect	No effect	May protect top level predator
Trawl Seabird Avoidance	No effect	No effect	No effect	No effect	Reduction in incidental take	No effect	May protect top level predators
LOF Category proposal	No effect	No effect	No effect	Improve protection by additional oversight and information collection, may result in take reduction plan	No effect	No effect	May provide additional protection to top level predators and additional ecosystem information
Halibut and Sablefish IFQ Program Amendments	No effect	No effect	No effect	May reduce marine mammal interactions in the BS sablefish fishery.	May reduce incidental take in the BS sablefish fishery	May result in better protection for habitat features	May protect top level predators
Subsistence Halibut Program Amendments	May be beneficial by providing better assessment of the stock	May improve incidental catch levels and assessment	No effect	No effect	No effect	No effect	May provide additional ecosystem information

Target species

The direct and indirect effects of the action on target species of Pacific halibut were evaluated in Section 4.2. Total catch and the associated limits on fishery mortality have generally changed by small amounts since the baseline used for this analysis. As shown in section 5.2 above, the Pacific halibut fishery has continued in similar spatial and temporal patterns as in the past; total harvests remain at or under established quotas, the Pacific halibut fishery remains robust, and the Pacific halibut fishery is not in imminent danger of being overfished. Total harvests have remained fairly constant so that prey availability and habitat suitability are not likely to have been affected. When combining the effects of the past harvests with the direct effects, the cumulative effects are not expected to jeopardize the capacity of the Pacific halibut stock to produce MSY on a continuing basis or to maintain at or above sustainable levels, and therefore, the cumulative effects on Pacific halibut from past harvests are insignificant.

The past action of Amendments 81/74 for the implementation of ecosystems policy will likely be beneficial to Bering Sea Pacific halibut stocks by improving overall management of the ocean ecosystem. It is unlikely that fishing mortality may change to allow the stock to return to unfished biomass and therefore the effects on fishing mortality would be insignificant. Because no specific action to implement an ecosystem policy for fisheries management has been identified, the significance of cumulative effects of ecosystem policy implementation on spatial and temporal distribution of the fisheries, changes in prey availability and changes in habitat suitability cannot be determined at this time. However, these effects are likely to be beneficial and may enhance the ability of stocks to sustain themselves at or above sustainable levels.

Future harvest specifications will primarily affect fishing mortality as the other significance criteria for Pacific halibut as a bycatch species (temporal and spatial harvest, prey availability, and habitat suitability). The setting of harvest levels each year for groundfish is controlled to ensure the stock can produced MSY on a continuing basis. Each year's setting of harvest specifications include the consideration of past harvests and future harvests based on available biomass estimates. Because of the controls on fishing mortality in setting harvest levels to maintain stable Pacific halibut populations, the cumulative effects of the future harvest specifications in combination with future harvest specifications are likely to be insignificant.

The future action to identify essential fish habitat and HAPC may improve the biological capacity of the Pacific halibut stocks by eventually resulting in protection measures for these areas. The future impact of EFH/HAPC management on fishing mortality would be insignificant because any changed in fishing mortality is unlikely to allow the stocks to return to their unfished biomass. Future effects on prey availability, habitat suitability, and spatial and temporal management measures are likely to be somewhat beneficial.

Other, non-specified, and forage species

The cumulative effects on the impact categories including other, non-specified, and forage species, are analyzed together in this section.

Virtually no data exist that would allow quantitative assessments of cumulative effects on biomass, seasonal distributions, and natural mortality of other, non-specified, and forage species. Qualitative estimates of the direction of change in these species harvests are made assuming that they are roughly proportional to target species harvests. Alternatives 1 and 2 have been rated "insignificant" because Pacific halibut harvests will not increase. The past and future actions

identified are not likely to change the harvest of other, non-specified, and forage species by more than 50 percent when added to the direct and indirect effects of the annually established halibut harvest, and therefore the cumulative effects are insignificant.

The past action of establishing ecosystem policy to fisheries management and the future action of identifying EFH and HAPC may be beneficial to other, non-specified, and forage species. Both of these actions may result in protection of the habitats used by these species and in the structure of the ecosystem that supports these species. Not enough information exists to allow for an analysis or to specify criteria for such effects.

Marine Mammals

Past actions that may have beneficial impacts on marine mammals are Amendments 81/74 for the ecosystem policy for fisheries management and the 2004 List of Fisheries. The use of ecosystem principals in fisheries management is likely to lead to more consideration for the impact of the groundfish fisheries on marine mammals and more efforts to ensure the ecosystem structure that marine mammals depend upon is maintained. The changes in the List of Fisheries to separate the specific fisheries for purposes of marine mammal take reduction will lead to better collection of information and more appropriate development of take reduction measures. This may ultimately lead to less incidental take and interaction with the groundfish fisheries. However, the Pacific halibut fishery remains a Category III fishery and the change in the groundfish category designation should have little effect on the Pacific halibut fishery. Therefore, effects of this action in combination with these past actions are considered insignificant.

The future impact of identifying EFH and HAPC may result in improved foraging for marine mammals if their prey species are benefited by this future action. The proposed change of several groundfish fisheries to Category II in the LOF may be beneficial to marine mammals by increasing the potential for observers collecting marine mammals and groundfish fisheries interaction information and by any take reduction plans that may be implemented. The improved observer information could, in turn, support reduced take methods in the Pacific halibut fishery.

In the SSL SEIS (NMFS 2001c) and the draft EIS for fur seal subsistence hunting (NMFS 2004b), the cumulative effects from the indirect impacts of the groundfish fisheries were described as conditionally adversely significant. The significance criteria used in the draft EIS for fur seal harvest for the indirect effect from the Bering Sea Pacific halibut fishery on fur seals is not specified. The significance of direct effects on fur seals was determined by comparing the number of animals harvested to the potential biological removal, with less than 10 percent being insignificant, and the impact on the population growth. For purposes of the analysis for marine mammals in this EA, the significance criteria for marine mammals are described in Table 4.1-5 and is based on potential changes in population trajectory from incidental catch and changes in indirect effects beyond the baseline. Future actions for improved management of fur seals may result from the increased concern that has been demonstrated by the Council in the formation of the Fur Seal Committee and the continued development of information regarding the Pacific halibut fishery interactions and fur seals. However, it is not possible to foresee the timing and nature of potential protection measures for fur seals.

Seabirds

A past action that may have beneficial impacts on seabirds is Amendments 81/74 for the ecosystem policy for fisheries management. The use of ecosystem principals in fisheries

management is likely to lead to more consideration for the impact of all groundfish fisheries on seabirds and more efforts to ensure the ecosystem structure that seabirds depend upon is maintained. Because the specific actions resulting from ecosystems considerations in Pacific halibut management are undetermined, it is not possible to evaluate the effects of the directed Pacific halibut fishery in combination with this action.

The implementation of the seabird avoidance measures and the potential development of avoidance measures for the trawl fisheries may affect seabirds. The potential effect is limited to the incidental take in the groundfish fisheries. The implementation of the seabird avoidance measures for the hook-and-line fisheries has resulted in decreases in the incidental take of seabirds since 2002 (Appendix C). No data is available to determine if the reduction in take is likely to have population level effects. Because the seabird avoidance measures for hook-and-line fisheries will be in effect during the current and future Pacific halibut fisheries, the amount of incidental take is likely to be the same. Therefore the effects of the past action of seabird avoidance measures for the hook-and-line fisheries with the current directed Pacific halibut fishery is likely to have similar effects to the baseline fishery and are therefore insignificant.

The future adoption of seabird avoidance measures for the trawl fishery will likely result in reduction in the incidental take of seabirds. It is not possible to evaluate the amount of benefit because the effectiveness of such measures cannot be determined until implementation and data collection and population effects are uncertain (Appendix C). It is likely that the combined effect of this action and the future trawl seabird avoidance measures will result in less incidental take than experienced in the baseline fishery.

Habitat

The past action that may have effects on habitat is Amendments 81/74 for the ecosystem policy for fisheries management. Habitat is one component of the ecosystem that includes the Pacific halibut fishery. Fisheries management measures will be developed with consideration of the entire ecosystem, including habitat. The level of mortality to habitat will likely decrease, benthic community structure will likely increase and the distribution of fishing effort based on geographic diversity of management measures will likely increase to improve protection to habitat. The implementation of Amendments 81/74 in combination with the directed Pacific halibut fishery may result in beneficial effects, but these effects cannot be evaluated until management measures are developed and implemented.

One future action that may have impacts on habitat is future harvest specifications for the groundfish fisheries. Understanding that portions of habitat are impacted each year by fishing activities and some of those habitats may require exceptionally long periods to recover from fishing impact (i.e., slow growing, long lived corals) (NMFS 2005), cumulative impact of the Pacific halibut fishery in combination with future harvest specifications may have lasting effects on habitat. As the slow growing, long-lived components of the habitat are impacted by cumulative years of fishing, there is likely to be cumulative mortality and damage to living habitat and changes to the benthic community structure. Species that are able to recover faster from fishing impacts may displace the longer-lived, slower growing species, changing the structure and diversity of the benthic community. In any event, NMFS evaluates the environmental impacts of the annual specifications prior to implementation.

The recent description of EFH and HAPC and the possible implementation of precautionary measures, may have cumulative effects on habitat, but these measures are too speculative to

predict and analyze at this time. As with Amendments 81/74, any such measures are likely to result in the decrease in mortality and damage to marine habitat, the increase in benthic community structure and changes in the distribution of fishing effort.

Ecosystem

Indicators of ecosystem function used to assess the effects of the Pacific halibut fishery on the ecosystem are listed in Table 4.1-8. The past action of Amendments 81/74 will incorporate ecosystem considerations into the management of the Alaska groundfish fisheries and provide beneficial information to the management of Pacific halibut. All of the significance criteria for ecosystems would be considered in the development of management measure which would likely result in beneficial effects. Because the specific actions are not identified at this time, it is not possible to determine the significance of the current action with the effect of having an ecosystems policy for fisheries management. Therefore the cumulative effect of allowing the use of Area 4C halibut IFQ and CDQ in Area 4D and Amendments 81/74 is speculative but likely beneficial.

The other past actions that may have effects on the ecosystem are the 2004 LOF and the seabird avoidance measures for hook-and-line fisheries. The LOF and seabird avoidance measures may provide additional protection to marine mammals and seabirds, which are considered top level predators. The removal of top level predators is an important consideration for predator-prey relationships in the ecosystem. Implementation of the LOF and the seabird avoidance measures would likely result in the catch level not being high enough to cause the biomass of the one or more top level predator species to fall below minimum biologically acceptable limits and therefore the significance criteria is not likely to be exceeded. Therefore, the effects of allowing the use of Area 4C halibut IFQ and CDQ in Area 4D in combination with the past effects of the 2004 LOF and seabird avoidance measures for hook-and-line fisheries are likely to have cumulatively beneficial impacts that are insignificant.

The future identification of EFH and HAPC will likely have effects on the ecosystem. Resulting protection measures for EFH and HAPC would provide protection for structural diversity that may result in improved function of the habitat and ultimately the ecosystem. Any protection measures are likely to prevent removals that would be high enough to cause a change in the functional diversity outside of the range of natural variability and would therefore not exceed the significance criteria. The effects of allowing the use of Area 4C halibut IFQ and CDQ in Area 4D in combination with the future identification of EFH and HAPC are likely to have cumulatively beneficial impacts that are insignificant.

The other future actions that may have effects on the ecosystem are the proposed LOF, fur seal management, and seabird avoidance measures for the trawl fisheries. These actions may provide additional protection to marine mammals and seabirds, which are considered top-level predators. The removal of top-level predators is an important consideration for predator-prey relationships in the ecosystem. Implementation of these actions would likely result in the catch level not being high enough to cause the biomass of the one or more top-level predator species to fall below minimum biologically acceptable limits and therefore the significance criteria is not likely to be exceeded. The effects of allowing the use of Area 4C halibut IFQ and CDQ in Area 4D in combination with these future actions' effects are likely to have cumulatively beneficial impacts that are insignificant.

5.5 Summary

The cumulative effects of this action, in combination with past actions, and reasonably foreseeable future actions are insignificant.

Cumulatively significant biological, social, or economic impacts are not likely to occur under the preferred alternative. Because the IPHC considers the halibut in Area 4C, 4D, and 4E to be a single stock, no change in halibut removals in the management area will occur under Alternative 1 or 2. Since no change occurs in harvest, impacts as a result of either alternative should result in no impacts or insignificant impacts to the human environment.

6.0 Environmental Analysis Conclusions

The intent of allowing Area 4C IFQ or CDQ holders to harvest their IFQ or CDQ in Area 4D is to balance the harvest of Pacific halibut during the fishing year consistent with established total optimum yield amounts, economic needs, and ecosystem needs. The effects of the alternatives were evaluated for all resources, species, and issues that may directly or indirectly interact with the Pacific halibut fisheries within the action area. The impacts of the alternatives are assessed in section 4 and 5 of this EA.

One of the purposes of an EA is to provide the evidence and analysis necessary to decide whether an agency must prepare an environmental impact statement (EIS). A Finding of No Significant Impact (FONSI) is the decision maker's determination that the proposed action will not result in significant impacts to the human environment and therefore further analysis in an EIS is not needed.

NEPA significance is determined by considering the context in which the action will occur and the intensity of the action. The context in which the action will occur includes the specific resources, ecosystem, and the human environment affected. The intensity of the action includes the type of impact (beneficial versus adverse), duration of impact, and other factors (see 40 CFR 1508.27(b)).

Context

The setting of the proposed action is the halibut IFQ and CDQ fisheries in the Bering Sea off Alaska in Area 4C and 4D. Any effects of these actions are limited to these areas. The effects on society within these areas are on individuals directly and indirectly participating in the halibut IFQ and CDQ fisheries and those who use the ocean resources. The proposed actions include minor changes to currently allowed fishing practices among participants in the halibut fishery in Area 4C and 4D. This action has no significant impacts on society as a whole or regionally.

Intensity

A listing of considerations to determine intensity of the impacts are in 40 CFR § 1508.27 (b) and in the NOAA Administrative Order 216-6. Each consideration is addressed below in order as it appears in the regulations.

1. **Beneficial and adverse impacts are required to be considered in this action, including sustainability of target and non-target species, damage to ocean or coastal habitat or**

essential fish habitat, effects on biodiversity and ecosystems and marine mammals. Impacts are limited to the participants in the halibut IFQ and CDQ fisheries in Areas 4C and 4D of the Bering Sea. Under Alternative 2, Allowing Area 4C halibut to be harvested in Area 4D may have a beneficial impact to eligible IFQ and CDQ holders in Area 4C by providing them increased access to the Area 4C-E halibut resource. No significant adverse impacts were identified for Alternative 2. There are no beneficial impacts associated with Alternative 1, and the negative impact associated with it is continued localized depletion in Area 4C.

2. **Public Health and Safety** may be positively impacted by allowing larger vessels in Area 4C to fish their IFQ and CDQ in Area 4D under Alternative 2. This would reduce pressure on near shore stocks of halibut in Area 4C, thereby increasing availability of halibut to smaller vessels near shore. Accessibility of the halibut resource close to shore would prevent smaller vessels from traveling further from shore to catch their allocation. The status quo under Alternative 1 would negatively impact small vessels by potentially requiring them to go further from shore to fish their IFQ or CDQ.

3. This action takes place in the geographic area of the Bering Sea. Even though this area contains **cultural resources and ecologically critical areas**, no effects on the unique characteristics of these areas are anticipated to occur with this proposed action.

4. The effects of this action on the human environment are not **controversial**. The preferred alternative is potentially socially and economically controversial because it could potentially redistribute and concentrate fishing effort from Area 4C into Area 4D. However, the preferred alternative was recommended by participants in Area 4C, Area 4D, (the entities that are subject to the regulations), and by the North Pacific Fishery Management Council.

5. The action analyzed in this EA is very limited in scope, and it is anticipated that there will be minimal or no **risk to the human environment, including social and economic effects**, by implementing this action. No significant adverse impacts were identified for Alternative 2.

6. **Future actions** related to this proposed action may result in impacts and are addressed in Chapter 5.0 of this EA. To the extent that future research indicates a further segregation of the halibut biomass in Area 4C-E to biologically distinct areas is necessary, additional action to review allowing Area 4C halibut IFQ or CDQ to be harvested in Area 4D may be necessary. Pursuant to NEPA, appropriate environmental analysis documents will be prepared to inform the public and decision makers of potential impacts of future actions on the human environment, and mitigation measures are likely to be implemented to avoid significantly adverse impacts.

7. **Cumulatively significant impacts, including those on target and non-target species** are not expected with this action. Cumulative impacts of the alternatives are analyzed in Chapter 5.0. The cumulative effects of this action, in combination with past actions, and reasonably foreseeable actions are insignificant. Alternative 2 would make minor modifications to existing regulations and management measures applicable to the halibut IFQ and CDQ fisheries, which would result in no significant impact to the natural environment or socioeconomic conditions.

8. This action will have no effect on **districts, sites, highways, structures, or objects listed or eligible for listing in the National Register of Historic Places**, nor cause loss or destruction of significant scientific, cultural, or historical resources. This consideration is not applicable to this action.

9. NEPA requires NMFS to determine the degree an action may affect **threatened or endangered species or critical habitat under the ESA**. Details of potential effects are listed in section 4.5 and 4.6. Interactions between the Area 4C-E halibut IFQ or CDQ fishery and any listed marine mammal, fish, or seabird are insignificant under Alternatives 1 and 2.

10. This action poses **no known violation of Federal, State, or local laws or requirements for the protection of the environment**. Alternatives under this action would be conducted in a manner consistent, to the maximum extent practicable, with the enforceable provisions of the Alaska Coastal Management Program within the meaning of section 30(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

11. Alternatives 1 and 2 pose **insignificant effects on the introduction or spread of nonindigenous species** into the Bering Sea because they do not change fishing, processing or shipping practices that may lead to the introduction of non-indigenous species.

Comparison of Alternatives and Selection of the Preferred Alternative

Alternative 1 would maintain the status quo. Area 4C IFQ or CDQ holders would be allowed to harvest their IFQ or CDQ only in Area 4C. IFQ and CDQ holders would likely continue to be unable to harvest their full allocations under Alternative 1 and adverse economic conditions would likely persist.

Alternative 1 would maintain the status quo. Area 4C IFQ or CDQ holders would be allowed to harvest their IFQ or CDQ only in Area 4C. IFQ and CDQ holders would likely continue to be unable to harvest their full allocations under Alternative 1 and adverse economic conditions would likely persist.

Alternative 2 is the preferred alternative because: (1) it takes into account the best and most recent information available regarding the status of the Pacific halibut stock, public testimony, and economic concerns; (2) it would allow additional harvesting opportunities for the small boat halibut IFQ and CDQ fisheries in Area 4C; and (3) it is consistent with the Halibut Act, the Magnuson-Stevens Fishery Conservation and Management Act, and Endangered Species Act. Council of Environmental Quality regulations at 40 CFR 1508.14 describe the human environment. No significant impacts are anticipated to affect the human environment under this alternative, therefore precluding the need for an EIS.

Table 6.0-1 Summary of significant determinations with respect to direct and indirect impacts.

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown		
Issue	**Alt. 1**	**Alt. 2**
Target Fish Species (Section 4.2)		
Fishing mortality	I	I
Spatial temporal concentration of catch	I	I
Change in prey availability	I	I
Habitat suitability: change in suitability of spawning, nursery, or settlement habitat, etc.	I	I
Other and non-specified species (Section 4.3)		
Incidental catch of other species and non-specified species	I	I
Forage species (Section 4.4)		
Incidental catch of other species and non-specified species	I	I
Marine Mammals (Section 4.5)		
Incidental take/entanglement in marine debris	I	I
Spatial/temporal concentration of fishery	I	I
Global Harvest of prey species	I	I
Disturbance	I	I
Northern Fulmar (Section 4.6)		
Incidental take–BSAI	I	I
Prey availability	I	I
Benthic habitat	I	I
Short-tailed Albatross (Section 4.6)		
Incidental take	I	I
Prey Availability	I	I
Benthic Habitat	I	I
Other Albatrosses & Shearwaters (Section 4.6)		
Incidental Take	I	I

Prey Availability		I	I
Benthic Habitat		I	I
Piscivorous Seabirds (Also Breeding in Alaska) (Section 4.6)			
Incidental Take		I	I
Prey Availability		I	I
Benthic Habitat		I	I
Eiders (Spectacled and Stellers) (Section 4.6)			
Incidental Take		I	I
Prey Availability		I	I
Benthic Habitat		I	I
Other Seabird Species (Section 4.6)			
Incidental Take		I	I
Prey Availability		I	I
Benthic Habitat		I	I
Marine Benthic Habitat (Section 4.7)			
Level of mortality and damage to living habitat		I	I
Modification of Benthic Community Structure		I	I
Changes in Distribution of Fishing Effort		I	I
Ecosystem Considerations (Section 4.8)			
Predator-prey relationships			
Pelagic forage availability		I	I
Spatial and temporal concentration of fishery impact on forage		I	I
Removal of top level predators	Trophic level of catch	I	I
	Top predator bycatch levels	I	I
	Pop status of top predators	I	I
Introduction of nonnative species		I	I

Energy flow and balance			
Energy flow and balance	Trends in offal and discard production levels	I	I
	Scavenger population trends	I	I
	Bottom gear effort	I	I
Energy removal		I	I
Diversity			
Species diversity	Population levels of target and nontarget relative to minimum spawning biomass or ESA listing thresholds linked to fishing removals	I	I
	Bycatch amounts of sensitive species lacking pop. estimates	I	I
	Number of ESA listed marine species	I	I
	Area closures	I	I
Functional diversity	Guild diversity or size diversity changes linked to fishing	I	I
	Bottom gear effort	I	I
	HAPC biota bycatch	I	I
Genetic diversity	Degree of fishing on spawning aggregations or larger fish	I	I
	Older age group abundances of Pacific halibut stocks	I	I

No known significant environmental impacts have been identified as a result of the preferred alternative to allow Area 4C IFQ and CDQ holders to fish their IFQ or CDQ in Area 4D. As a result, no adverse impacts to the halibut resource or the human environment are expected.

Table 6.0-2 Species currently listed as endangered or threatened under the ESA.

Common Name	Scientific Name	ESA Status
Northern Right Whale	*Balaena glacialis*	Endangered
Bowhead Whale [2]	*Balaena mysticetus*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Blue Whale	*Balaenoptera musculus*	Endangered
Fin Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Sperm Whale	*Physeter macrocephalus*	Endangered
Steller Sea Lion	*Eumetopias jubatus*	Endangered and Threatened [3]
Snake River Sockeye Salmon	*Onchorynchus nerka*	Endangered
Snake River Fall Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Snake River Spring/Summer Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Puget Sound Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Lower Columbia River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Willamette River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Columbia River Spring Chinook Salmon	*Onchorynchus tshawytscha*	Endangered
Upper Columbia River Steelhead	*Onchorynchus mykiss*	Endangered
Columbia River Chum Salmon	*Onchorynchus keta*	Threatened
Snake River Basin Steelhead	*Onchorynchus mykiss*	Threatened
Lower Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Upper Willamette River Steelhead	*Onchorynchus mykiss*	Threatened
Middle Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Short-tailed Albatross	*Diomedia albatrus*	Endangered
Spectacled Eider	*Somateria fishcheri*	Threatened
Steller Eider	*Polysticta stelleri*	Threatened
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered
Kittlitz Murrelet[4]	*Brachyramphus brevirostris*	Candidate
Northern Sea Otter[5]	*Enhydra lutris*	Candidate

[1] Marine mammals not listed under the ESA that may be present in the BSAI and GOA management areas including cetaceans, [minke whale *(Balaenoptera acutorostrata*), killer whale (*Orcinus orca*), Dall's porpoise (*Phocoenoides dalli*), harbor porpoise (*Phocoena phocoena*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), and the beaked whales (e.g., *Berardius bairdii* and *Mesoplodon spp*.)] as well as pinnipeds [Pacific harbor seal *(Phoca vitulina*), northern fur seal (*Callorhinus ursinus*), Pacific walrus (*Odobenus rosmarus*), spotted seal (*Phoca largha*), bearded seal (*Erignathus barbatus*), ringed sea (*Phoca hispida*) and ringed seal (*Phoca fasciata*)], and the sea otter *(Enhydra lutris*).

[2] Bowhead whale is present in the Bering Sea area only.

[3] Steller sea lions are listed as endangered west of Cape Suckling and threatened east of Cape Suckling.

[4] The Kittlitz murrelet has been proposed as a candidate species by the USFWS (69 FR 24875, May 4, 2004)
[5] The northern sea otter has been proposed by USFWS as a candidate species (November 9, 2000; 65 FR 67343).

7.0 CZMA Considerations

Based on the information contained in this analysis, implementation of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Management Program within the meaning of section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

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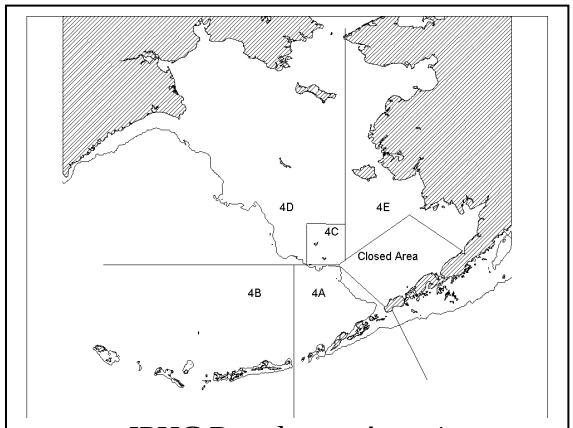
Appendix A: 2004 Pacific Halibut Stock Assessment

This document is included by reference. The 2004 version may be found here:
http://www.iphc.washington.edu/halcom/research/sa/papers/sa04.pdf

Appendix B: Area 4 Catch Sharing Plan

North Pacific Fishery Management Council

Pacific Halibut Catch Sharing Plan for Area 4



IPHC Regulatory Area 4

The NPFMC developed a Catch Sharing Plan (CSP) for the Pacific halibut Hippoglossus stenolepis in the Bering Sea and Aleutian Islands for allocating the Regulatory Area 4 catch limit established by the IPHC among the five subareas. This Plan was adopted by the Secretary and first implemented in 1996 (61 FR 11337, March 20, 1996) as an interim measure while the International Pacific Halibut Commission (IPHC) further evaluated a new policy of using a biomass-based method for setting catch limits for Areas 4A, 4B, and 4C-E. In 1998, the CSP was amended to remove Areas 4A and 4B to concur with the newly adopted IPHC policy of using an equal exploitation rate strategy for the halibut resource in subareas 4A and 4B where considerable stock separation occurs (63 FR 13001, March 17, 1998). However, there was no biological basis for the distribution of the catch limits among Subareas 4C, 4D, and 4E because of a lack of stock separation between them. Therefore, the IPHC recommended setting a catch limit for the combined subareas. It delayed implementation of the methodology until 1998 to allow the Council to revise the CSP.

Catch Sharing Plan for Area 4C-E

Area	**Percent of Area 4 CEY**
Area 4C	Area 4C-E CEY - 80,000 + 46.43%
Area 4D	Area 4C-E CEY - 80,000 + 46.43%
Area 4E	80,000 + 7.14%

The North Pacific Fishery Management Council identified that the historical apportionment of catch limits among Subareas 4C-E was important to achieve the socioeconomic objectives of the halibut Individual Fishing Quota and Western Alaska Community Development Quota programs, which allocate halibut among U.S. fishermen.. The Halibut Act authorizes the Council to develop regulations that have allocation of harvesting privileges as the primary objective.

The revised CSP is a framework applied to the annual combined Areas 4C, 4D, and 4E catch limit established by the IPHC. A direct allocation of 80,000 lb is made to Subarea 4E in the revised CSP when the Subarea 4C-E catch limit is greater than 1,657,600 lb. The purpose was to provide CDQ fishermen in subarea 4E with additional harvesting opportunity. The entire subarea 4E catch limit is assigned to the CDQ reserve and subsequently allocated to qualifying CDQ groups. The Council identified that the subarea 4E catch limit had been unreasonably constrained in the years prior to the CSP. The remainder of the combined catch limit is allocated: 46.43 percent to both Subareas 4C and 4D and 7.14% to Subarea 4E

Appendix C: Ecosystem Considerations

This document is included by reference. The 2004 version may be found here:
http://www.afsc.noaa.gov/refm/docs/2004/BSAIGOA_Ecosystem_2004.pdf