UNITED STATES DEPARTMENT OF COMMERCE
Office of the Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230

AUG 10 1999

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act, an environmental review has been performed on the following action.

TITLE: Environmental Assessment for an Exempted Fishing Permit (99-03) to Assess Existing and Proposed Methods of Species Composition Sampling

LOCATION: Federal waters in the Bering Sea and Aleutian Islands management area

SUMMARY: This Environmental Assessment addresses an exempted fishing permit (EFP) application submitted by Groundfish Forum, Inc. under 50 CFR part 679.6. The EFP application was received by the National Marine Fisheries Service (NMFS) on April 19, 1999, and was reviewed and endorsed by the North Pacific Fishery Management Council at its April 1999 meeting. The EFP was developed in coordination with the NMFS North Pacific Groundfish Observer Program and proposes to examine the accuracy of at-sea observer basket sampling practices, the design and use of automated species composition sampling, and the effect of fish stratification by size in trawls and how that affects size composition sampling.

RESPONSIBLE OFFICIAL: Steven Pennoyer
Administrator, Alaska Region
National Marine Fisheries Service
709 West 9th Street
Juneau, AK 99801
Phone: 907-586-7221

The environmental review process led us to conclude that this action will not have a significant impact on the environment. Therefore, an environmental impact statement was not prepared. A copy of the finding of no significant impact, including the environmental assessment, is enclosed for your information. Also, please send one copy of your comment to me in Room 5805, PSP, U.S. Department of Commerce, Washington, D.C. 20230.

Sincerely,

Susan Fruchter

Susan Fruchter
NEPA Coordinator

Enclosure

Title: Environmental Assessment for an Exempted Fishing Permit (99-03) to Assess Existing and Proposed Methods of Species Composition Sampling

Date: June 28, 1999

Lead Agency: National Marine Fisheries Service
Alaska Regional Office
Sustainable Fisheries Division
Juneau, Alaska

Responsible Official: Steven Pennoyer, Administrator, Alaska Region, NMFS

For Further Information Contact: Susan Salveson, NMFS, Alaska Region, 907-586-7228

Abstract: This Environmental Assessment (EA) addresses an exempted fishing permit (EFP) application submitted by Groundfish Forum, Inc. under 50 CFR part 679.6. The EFP application was received by NMFS on April 19, 1999, and was reviewed and endorsed by the Council at its April 1999 meeting. The EFP was developed in coordination with the NMFS North Pacific Groundfish Observer Program and proposes to examine the accuracy of at-sea observer basket sampling practices, the design and use of automated species composition sampling, and the effect of fish stratification by size in trawls and how that affects size composition sampling.

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1.0 Introduction

The groundfish fisheries in the exclusive economic zone (EEZ) off Alaska are managed by the National Marine Fisheries Service (NMFS) under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The mission of NMFS is the stewardship of living marine resources for the benefit of the nation through their science-based conservation and management and promotion of the health of their environment. The goals for accomplishing this mission are sustainable fisheries, recovered protected species, and healthy living marine resource habitat. Guidance for achieving these goals is taken from relevant Federal legislation.

The groundfish fisheries in the Bering Sea and Aleutian Islands management area (BSAI) are managed under the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area (FMP) developed by the North Pacific Fishery Management Council (Council) under the Magnuson-Stevens Act. The FMP was approved by the Secretary of Commerce and became effective in 1982. Under regulations implementing the FMP at 50 CFR 679.6 and 600.745, the Administrator, Alaska Region, National Marine Fisheries Service (NMFS), after consulting with the Council, may authorize for limited experimental purposes, fishing for groundfish in a manner that would otherwise be prohibited. In additional to the Magnuson-Stevens Act, such action is governed by the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), and the Marine Mammal Protection Act (MMPA).

This Environmental Assessment (EA) addresses an exempted fishing permit (EFP) application submitted by Groundfish Forum, Inc. under 50 CFR part 679.6. The EFP application was received by NMFS on April 19, 1999, and was reviewed and endorsed by the Council at its April 1999 meeting. The EFP was developed in coordination with NMFS North Pacific Groundfish Observer Program and proposes to examine the accuracy of at-sea observer basket sampling practices, the design and use of automated species composition sampling, and the effect of fish stratification by size in trawls and how that affects size composition sampling.

NEPA requires a description of the purpose and need for the proposed action as well as a description of alternative actions. This information is included in Sections 1 and 2 of this document. Section 3 contains information on the biological and environmental impacts of the alternatives as required by NEPA. Impacts on endangered species and marine mammals are also addressed in this section.

1.1 Purpose and Need

Management of the BSAI groundfish fisheries is reliant on accurate catch accounting on a species by species basis so that total harvest mortality may be credited against harvest limitations annually specified for groundfish and prohibited species. Accounting of species catch mortality, particularly catch that is sorted at-sea, is dependent on species composition sampling by NMFS-certified observers that accurately reflects the major components of species catch per tow so that removals of all major species are accounted for. Recently implemented management programs,

such as the Western Alaska Community Development Quota program and the American Fisheries Act, are increasingly reliant on observer data to monitor and verify multi-species catch composition on a vessel specific basis. The Council is considering a new program that would allocate vessel-specific bycatch amounts for specified species in the future. All of these programs depend heavily on accurate catch composition estimates on a haul by haul basis.

NMFS currently relies on NMFS-certified observers to determine species composition of sampled hauls using standard methods of species composition sampling. In mixed species fisheries, observers onboard trawl vessels typically rely on basket samples of fish collected randomly as fish are passed from the trawl codend into a holding bin (trawl catcher vessels) or as fish pass from live tanks into the processing line (catcher/processors). Concern exists that these species composition sampling techniques may not accurately reflect catch composition of an individual haul. The intent of the EFP is to measure the accuracy or potential bias of current sampling techniques and provide data for improvements in sampling. In addition, an automated sampling technique will be tested that could reduce potential bias and conflict between vessel crew and observers that is associated with current sampling methodology.

The experimental design described in the application for the EFP and in section 2 of this EA was developed in coordination with the North Pacific Groundfish Observer Program, Alaska Fisheries Science Center, NMFS. NMFS is supportive of experimentation to assess the accuracy of catch composition and accounting given the agency's responsibility to monitor and manage total mortality of fishery resources as a result of the fishing activities authorized under the FMP. Successful completion of the experiment could provide data for improvements in observer sampling of catch and facilitate more accurate accounting of total catch mortality associated with the commercial North Pacific groundfish fisheries.

1.2 Related NEPA Documents

This EA tiers off the Alaska Groundfish Supplemental Environmental Impact Statement (SEIS) (NMFS 1998a) which analyzed the effects of groundfish fisheries in the EEZ off Alaska and examined fishery-induced impacts on all aspects of the ecosystem. This EA also incorporates by reference the EA for the 1999 Groundfish TAC Specifications (NMFS 1998b) and the EA for the EFH amendments to the Alaska Region FMPs (NPFMC 1999).

2.0 Description of Alternatives

2.1 No Action Alternative

An EFP would not be issued and an additional amount of groundfish and halibut bycatch would not be authorized for harvest. Without the EFP and associated provisions to conduct an experimental fishery outside the open access commercial fishery, the experimental work and associated results would not become available that could improve at-sea catch composition sampling. The experimental design developed to evaluate the adequacy of exisiting sampling

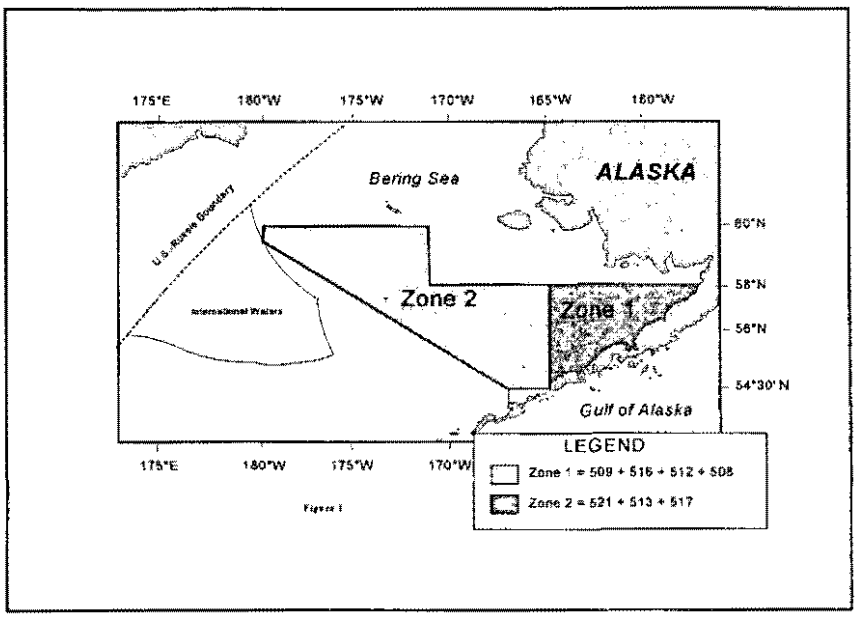
techniques for species composition requires an assessment of the potential for size stratification in the mixed species flatfish fisheries. This assessment will require limited directed fishing for Greenland turbot with trawl gear, a practice that is prohibited under existing regulations. Furthermore, the experimental design requires a census of major species catch on a haul by haul basis. Although the intent of the experiment is to develop a methodology to census catch by major species and species groups in a manner that can be practically applied in the open access fishery, the achievement of such a census is not trivial and will involve a great degree of additional effort and modifications to the way fishing and processing normally occurs onboard trawl vessels. Thus, the effort and required modifications to normal fishing operations necessary to accommodate the objectives of the EFP realistically cannot be achieved in the highly competitive open access fishery given the likely economic loss that would be incurred by the participating vessel owner/operator. As a result, necessary participation of a vessel owner/operator in the fishing activities proposed under the EFP would be unlikely unless the experimentation could occur outside of the open-access fishery.

2.2 Alternative A – (Preferred)

Issue the proposed EFP to evaluate the accuracy of species composition sampling by observers onboard vessels fishing in mixed species flatfish fisheries and develop data that can be used by NMFS for improvements in sampling methodology.

2.2.1 General Overview of Experimental Activities

The experimental fishery will be conducted by one vessel in the Bering Sea/Aleutian Islands flathead sole and Greenland turbot fisheries. Fishing under the EFP would take place in Bycatch Zone 2 and Statistical Area 519 of the Bering Sea (**Figure 1**) in areas normally fished for flathead sole and Greenland turbot. Exact fishing locations will be determined by the operator of the participating vessel. Fishing operations will start on or about September 3, 1999, and will last approximately 3-4 weeks. This time line is set to accommodate the schedule of NMFS personnel associated with the experiment. The participating vessel will be required to make one port call to Dutch Harbor during the course of the experiment for the exchange of EFP personnel.



The first two parts of this experiment (accuracy of basket sampling for species composition and automated species composition sampling) will consist of thirty tows each for a total of sixty tows. The project design anticipates approximately four to five tows per day. For this portion of the EFP, flathead sole will be the target species. The catch composition of each tow in Parts I and II should include more than 50% flatfish, with flathead sole being the predominant flatfish species. In the event that the actual catch composition is markedly and consistently different from the desired one as described above, Groundfish Forum and NMFS personnel will evaluate the actual catch composition's effect on the experiment and encourage the participating vessel to find remedies to maintain the quality of the experiment. Failure to achieve an acceptable catch composition may result in discontinuation of the experiment.

All of the incidental catch amounts of pollock and Pacific cod harvested in the flatfish fishing activities authorized under the EFP must be retained to minimize discard amounts, contrary to existing regulations that require retention of these two species only up to a specified maximum retainable catch allowance (§ 679.27). For all other non-flatfish species, standard maximum retainable catch allowances established in regulations at 50 CFR 679.20 will apply based on retained flatfish as the basis species. NMFS observer data on the average catch composition of tows from the 1997 and 1998 flathead sole target fishery are used to derive anticipated groundfish and PSC catch during parts I and II of the experiment (section 2.2.4, below). *These projections for catch composition are intended as guidelines for Parts I and II of the EFP.* The most important factor in the experimental work conducted during the first two parts of EFP will be maintaining a diverse species composition as described above and staying in general conformance with the "per tow" total groundfish catch of 15 metric tons. Assuming the participating vessel stays within these parameters, Parts I and II will conclude upon the completion of 60 tows.

The principle species of the third and final leg of the experiment (Part III - stratification of fish by size in trawls) will be Greenland Turbot. The EFP allows for the retention of Greenland turbot until a modified Greenland turbot maximum retainable bycatch amount is achieved, the vessel has retained a round-weight equivalent of 175 metric tons of turbot, a total of 342 tons of groundfish have been

harvested, or the upper limit of a halibut mortality guideline established for this portion of the experiment is reached, whichever occurs first. The estimated groundfish catch composition and halibut bycatch limit for part III of the EFP is described in section 2.2.4 of this EA.

No deck-sorting of groundfish or prohibited species will be allowed during parts I and II of the experiment. Deck-sorting of halibut will be required during the third (Greenland turbot) leg of the EFP in order to reduce the halibut bycatch mortality. An upper limit on halibut bycatch will be established for part III, but based on 1997-98 observer data collected on halibut bycatch rates in the Greenland turbot fishery, Groundfish Forum does not believe that the halibut bycatch limit will prevent the harvest of the entire allowable amount of turbot.

The single vessel selected to participate in the experiment will be allowed to retain all groundfish catches in accordance with the directed fishing standards for the 1999 third quarter flathead sole fishery except in the portion of the EFP that tests size composition of catch where the maximum retainable bycatch limits have been expressly modified to allow a limited target for Greenland turbot (see section 2.2.3). Groundfish, halibut mortality, and crab bycatch associated with this experiment will not be deducted from total allowable catch (TAC) or prohibited species bycatch allowances specified for the 1999 groundfish fisheries.

The participating vessel is required to carry a minimum of three NMFS-certified observers. Other on-board EFP personnel will include one NMFS scientist and one Groundfish Forum project coordinator. The vessel operator also will need to provide crew members or other qualified personnel to assist observers and to carry out the sorting and weighing of fish prior to discard.

2.2.2 Selected Fishery For and Timing of the Experiment

The BSAI flathead sole fishery is proposed for parts I and II of experiment evaluating sampling procedures and species composition. This fishery was chosen because it is a mixed fishery where flatfish and roundfish are commonly caught together in tows, tows are typically fairly long (2-3 hours), and haul size is fairly large (around 15 MT on average), but not so large to necessarily overwhelm the accounting necessary for the experiment. Mixed catches, tow duration, and size of hauls are important factors determining potential for catch to be stratified when sampled. An additional reason for selecting the flathead sole fishery is that it is currently the most economically viable flatfish fishery for the average size head-and-gut trawl catcher/processor vessel and the fishery occurs during the summer months when weather and conditions are better for the experiment. The yellowfin sole fishery can have mixed catches, but depending on the fishing strategy of the participant, it also can have rather homogeneous catches. Furthermore, few vessel owners, if any, would be willing to do all the extra work associated with this EFP in the yellowfin sole fishery given that this fishery likely will be open in September when the field portion of the EFP will be conducted.

The 1999 open access fishery for flathead sole reopens on July 4th with the third quarter release of halibut PSC and is expected to remain open until late July or early August, depending on

prohibited species bycatch rates in the fishery and the number of participants. The field work for this EFP is slated to be conducted in early September after the regular flathead sole fishery closes.

The size composition sampling evaluation (part III of the EFP) will take place immediately following the successful completion of the test of sampling methods (parts I and II of the EFP). Part III of the experiment will rely on a relatively small number of tows targeting Greenland turbot. The Greenland turbot fishery was selected for this portion of the EFP for several reasons. First, although Greenland turbot is not an appropriate target for the *species* composition sampling portion of the test because it typically does not involve much catch of roundfish and therefore presents low potential for species stratification, this fishery does present a reasonable venue for the *size* composition sampling work of the EFP because a mixture of fish of different sizes is expected for the principle species in the catch. Second, tasks associated with the evaluation of species composition sampling methods in parts I and II of the experiment are large and the additional cost to the EFP participant company is expected to be significant. The selected participant must dedicate crew members to assist observers during the project, task crew members to the sorting and weighing of discard species, and fish at a pace of four to five tows per day. This commitment creates the likelihood that the vessel will be operating below its break-even margin. An additional burden also exists of paying for up to three observers (one is normally required for vessels $\geq$ 125 feet) and the costs of feeding five to six extra people associated with the project. For this reason, it is important that the normal revenue from flathead sole fishing not be further reduced by excluding turbot target fishing from the EFP .

Given the requirements of the experimental fishing under parts I and II of the EFP and the number of tows needed for at least a preliminary assessment of size composition sampling in part III of the EFP, the EFP applicant proposed a modification to the normal maximum retainable bycatch (MRB) regulations pertaining to turbot retention for the flathead sole target. The modification is to allow the normal MRB allowance percentage for Greenland turbot against flathead sole (35%) to apply to the round weight equivalent of all retained catch from the 60 tows comprising parts I and II of the EFP for the following species: Pacific cod, pollock, and all flatfish other than Arrowtooth flounder. The allowance for turbot retention against catch retained during parts I and II of the experiment is a helpful incentive for the species composition sampling tests because with greater retention, the task of weighing discards of major species during the species composition test portion of the EFP is reduced somewhat.

2.2.3 Structure of the experiment

Parts I and II of the EFP - Species Composition Sampling Procedures

The experimental requirements of the vessel and crew during Parts I and II of the EFP will be focused primarily on species composition sampling procedures in the vessel's processing area. Three equally important operational goals are identified for these first two segments of the experiment: 1) determine the total actual weight of each haul using a certified flow scale; 2) determine the species composition of six separate 100 kg basket samples from each haul; and 3)

determine the actual weight by major species in each haul. The requirements for achieving these goals are detailed below. The selection of a participating vessel (see section 2.2.5) will be based primarily on a review panel's assessment of the vessel's proposal detailing its ability to meet these requirements.

The only difference between Parts I and II is the system used to determine how and when to take the six 100 kg samples. No other differences in the sampling procedures of Part I and II are proposed. In order to establish a direct and accurate comparison between the two sampling methods, the experiment will rotate between these two sampling regimes for a total of 60 tows in Parts I and II.

Actual Weight of Each Haul – Total haul weight will be determined using a certified flow scale. No sorting can occur prior to weighing. The flow scale will be periodically checked for precision. The experiment will not be performed without a functioning flow scale.

Species Composition of Basket Samples – With the assistance of the crew, six 100 kilogram basket samples will be collected from various portions of each haul at the observer station as the catch is run across the flow scale. Each sample will be sorted by species or species group. Separate species or species groups will be weighed on a platform scale at the observer station and added back to the remaining fish in the haul to be sorted and processed or discarded.

Actual Weight by Major Species – In order to compare the results of the six basket samples with the actual composition of the catch, it is necessary to determine the actual weight of several separate species and major species groups. This will be accomplished with the use of product recovery rates for retained groundfish and by determining the actual weight of PSC and some groundfish discards. The crew will be required to sort and weigh all discards of groundfish species that are retained at any time during Parts I and II of the experiment, all PSC discards and all skates (Rajiformes). These weights can be obtained either with a platform scale or by running each separate species across a flow scale after the haul has been weighed. The success of the experiment may depend greatly on the participating vessel's ability to accurately sort and weigh several tons of discard per tow and continuation of the EFP will depend on performance of these duties.

The discards of groundfish species (other than skates) that are not retained at any time during Parts I and II of the experiment need not be sorted and weighed. One purpose of the EFP will be to determine the actual weight (in the aggregate) of these discards by subtracting the total round weight equivalent of product and the total weight of the sorted and weighed discards from the total catch as measured by the flow scale.

Prior to the start of the experiment, a tow or tows will be made for the purpose of obtaining fish to determine accurate, vessel-specific product recovery rates and net case weights to be used in back-calculating the actual round weight of retained product. The accuracy of these recovery rates and case weights will be verified with periodic testing throughout the experimental fishery.

Because product recovery rates will be used to calculate the actual weight of various species on a haul-by-haul basis, the participating vessel will be required to ensure that product from each separate haul can be easily identified.

As previously noted, the participating vessel may discard without sorting and weighing all groundfish species or species groups of which there is no retention throughout Parts I and II of the experiment, but must account for the weight of all discards of any species or species group that is retained (plus PSC and skates) at any time during Parts I and II of the experiment. These criteria demand that the crew of the participating vessel develop a careful and practical strategy for determining what fish to retain and process. The experimental design, however, includes several significant incentives for the participating vessel to maximize the variety of species and amount of groundfish retained during Parts I and II. First, a review committee set up to select the participating vessel will give additional preference to those applicants who demonstrate an ability to sort and retain the greatest number of species. Second, the greater the percentage of catch of a particular species that is retained, the smaller the percentage of catch that will have to be sorted and weighed prior to discard. Last, the more groundfish (other than arrowtooth) retained during parts I and II, the larger the round weight equivalent of "basis species" against which the participating vessel may retain Greenland turbot during Part III of the experiment.

Part III - Size Composition Sampling

During the third part of the experiment, at least six samples of forty fish will be taken from each tow for the purpose of size composition testing. Catch composition testing may be done following normal sampling procedures. Deck sorting for halibut will be required. In contrast to Parts I and II, however, the sampling regime in Part III is not expected to be a major impediment to normal "fish handling" operations. The third part of the experiment will continue until the Greenland turbot maximum retainable bycatch amount is achieved, the vessel has retained a round-weight equivalent of 175 metric tons of Greenland turbot, a total of 342 tons of groundfish have been harvested, or the upper limit of halibut mortality is reached in Part III of the experiment, whichever occurs first. In this stage of the experiment, total catch weight measurements will be undertaken using flow scales, but separate measurements of discard amounts will not be collected.

2.2.4 Groundfish and prohibited species catch (PSC) needed to support the EFP

Groundfish

The catch of groundfish under this EFP must not exceed a total of 925 metric tons (mt) during parts I and II of the experiment and 342 mt during part III. If these authorized amounts are found to be insufficient to fully conduct the experiment, the applicant must confer with the Regional Administrator regarding potential modification to the EFP according to regulations at § 679.6.

The experimental design for parts I and II of the EFP necessary to meet the experiment's species

composition objectives calls for a total of 60 tows to test the two sampling methods (30 tows each) and approximately three to five short tows will be needed to determine product recovery rates as well as for use as test tows when a new fishing area is needed for the participating vessel. Based on 1997-1998 observer data collected in the BSAI flathead sole fishery, Groundfish Forum estimates that tows on average will catch approximately 15 mt of groundfish. The estimated species composition percentages listed in Table 1 are the average for all vessels in the flathead target calculated from observer data collected onboard vessels fishing for flathead sole during 1997 and 1998.

Given the EFP limitations for maximum retainable amounts of Greenland turbot described in section 2.2.2 of this EA, the likely amount of Greenland turbot harvest will be 140 mt, including any Greenland turbot caught during parts I and II of the EFP. An upper catch limit for Greenland turbot is set at 175 mt based on the data used to predict the catch of groundfish under parts I and II of the experiment. To attain that upper limit, all expected catch in parts I and II of Pacific cod, pollock, and flatfish other than Arrowtooth flounder would have to be retained in order to achieve an allowance to take 175 MT (round weight equivalent) of Greenland turbot. As mentioned above, the relaxed allowance for turbot retention against retained catch is a helpful incentive for the species composition sampling tests because with greater retention, the task of weighing discards of major species during the species composition test portion of the EFP is reduced somewhat.

Prohibited species catch

Based on observer data collected during the 1997 and 1998 summer flatfish fisheries on prohibited species bycatch rates, the EFP is expected to experience the PSC bycatch rates and amounts listed in Table 2. As mentioned above, deck sorting of halibut will not occur during parts I and II of the EFP given that halibut is an integral component of the species composition sampling the experiment is designed to assess. As a result, the mortality of halibut during the first two portions of the experiment is expected to approach 100 percent.

During part III of the experiment, halibut is the only expected prohibited species to be encountered given the deep-water nature of the Greenland turbot fishery. Based on observer data on halibut

Table 1. Estimated catch of groundfish necessary to support an experimental fishery to assess the accuracy of at-sea observer basket sampling practices and the effect of fish stratification by size in trawls.

Species	Parts I and II of EFP		Part III of EFP		
	Estimated percent composition of catch in flathead sole fishery	Estimated catch (metric tons) [1]	Estimated percent composition of catch in Greenland Turbot fishery	Estimated catch (metric tons)	Total estimated species-specific catch (rounded up to higher mt)
Flathead sole	21 %	194.25	5	17	212
Arrowtooth flounder	18	166.5	33	113	280
Yellowfin sole	10	92.5	-	-	93
Pacific cod	10	92.5	-	-	93
Pollock	8	74	5	17	91
Other flatfish	7	64.75	5	17	82
Rocksole	5	46.25	-	-	47
Other species	21	194.25	8 [2]	28	203
Sablefish	0	0	3	10	10
Greenland turbot	combined with part III		41	140 [3]	140 - 175
TOTAL	100	925 mt	100	342	1,267

1. Amounts of catch calculated using species percentages and based on 60 tows at 15 MT per tow and 5 test tows at 5 MT per tow.
2. Includes small amounts of rockfish, yellowfin sole, rocksole, and other species.
3. Estimated Greenland turbot catch is based on having sufficient retained catch of the Pacific cod, pollock, and flatfish other than Arrowtooth flounder retained under parts I and II of the EFP to retain a total of 140 mt of Greenland turbot. Authorized Greenland turbot harvest is limited to 175 mt contingent on not meeting other limiting conditions for Greenland turbot catch under part III of the EFP.

Table 2. Estimated catch of prohibited species necessary to support an experimental fishery to assess the accuracy of at-sea observer basket sampling practices and the effect of fish stratification by size in trawls.

Prohibited species catch (PSC)	Parts I and II of EFP		Part III of EFP		
	Anticipated bycatch rate per mt of groundfish	Anticipated bycatch amount	Anticipated bycatch rate per mt of groundfish	Anticipated bycatch amount	Total estimated PSC
Pacific halibut	0.02 mt	18.5 mt	0.01 - 0.03 mt	3.4 - 10.2 mt[1]	28.7 mt [1]
Red king Crab	0.14 crab	130 crab	none		130 crab
Other king crab	0.05 crab	46 crab	none		46 crab
C. bairdi Tanner crab	4.33 crab	4,005 crab	none		4,005 crab
Other Tanner crab	16.85 crab	15,586 crab	none		15,586 crab

1/ Bycatch mortality of Pacific halibut during part III of the experiment will be less than 10.2 mt given mandatory deck sorting of halibut and resulting mortality reduction associated with this portion of the experiment.

bycatch rates in the turbot fishery, the bycatch of halibut is estimated to be between 1 - 3 percent of the amount of groundfish catch estimated for part III of the experiment, or 3.4 to 10.2 mt. A halibut PSC limit is established for part III of the experiment at the 10.2 mt level. The decksorting protocol used during this portion of the EFP is expected to reduce the mortality of this halibut significantly from the currently specified rate of 73% used for the open access fishery where decksorting is not employed.

Nature of the Groundfish and PSC limitations for the EFP

The total amount of groundfish authorized for harvest in parts I and II (925 mt) and part III (325 mt) of the experiment are established in the EFP and may be revised in consultation with the Regional Administrator through amendment of the EFP under regulations at 679.6. With several exceptions, the nature of the anticipated species-specific catch associated with the experiment are viewed as guideline harvest limits consistent with overall catch limits and expected species composition associated with the flathead sole and Greenland turbot fisheries. The exceptions are the amount of halibut (10.2 mt) and Greenland turbot that may be taken during part III of the EFP. Once these amounts are reached, further fishing activities under the EFP are prohibited.

The nature of the experiment requires that the participating vessel be allowed to fish in a manner that would not affect the species composition of tows and defeat the experimental design to detect a given amount of variability in species composition. If species-specific EFP catch limits were imposed, a strong incentive would exist to change fishing methods or locations as one of the groundfish or PSC limits is approached. Bycatch avoidance could negatively impact the species composition sampling portion of the EFP (parts I and II) if such avoidance lowered the degree of potential variability or stratification of species in the catch. This would undermine the experimental design of the experiment and create a negative consequence for the value of the research.

Instead, Groundfish Forum, through NMFS personnel associated with the EFP, will be required to remain in consultation with the Regional Administrator, Alaska Region, NMFS, if groundfish or PSC catches are trending higher than anticipated. If necessary, appropriate adjustments to the overall groundfish catch limits under the EFP could be approved as amendments to the EFP. This process is preferred to absolute species-specific catch limits and the possibility that the test will be unnecessarily curtailed if catch composition varies from the anticipated and species-specific catches are greater than expected. Industry participants in the EFP will be informed that they must take all reasonable steps to fish in a manner that attains the desired catch composition reflective of the flathead sole (parts I and II) and Greenland turbot (part III) fisheries. This requirement together with limits on overall groundfish catch will constrain species specific catch amounts within acceptable levels.

As mentioned above, Greenland turbot and halibut catch restrictions will be absolute for the size composition portion (part III) of the EFP . Adherence to an upper limit is not likely to affect the

validity of this portion of the experiment because avoidance of areas with high halibut rates will not impact the evaluation of size composition sampling.

2.2.5 Vessel Participation

NMFS staff have recommended that the experiment be conducted on a trawl catcher/processor vessel primarily used to produce headed and gutted product because the problem of catch stratification is most often associated with the fisheries and vessel configurations of that sector. Parties interested in participating in this EFP experiment must apply through a "request for proposals" (RFP) process administered by the Groundfish Forum. The participating vessel will be chosen on the basis of how well the vessel's owners and crew are able to identify creative, workable solutions to the logistical challenges described in the experimental design developed jointly by NMFS and Groundfish Forum. The selection of a participating vessel will be made through a NMFS-directed review of applications. In the event that more than one vessel equally satisfies the requirements in the RFP, the participating vessel will be selected by lottery.

Guidelines for NMFS Exempted Fishing Permits stipulate that the name of companies and their participating vessels be listed in the application. Because this application sets up an RFP process, pre-determining the participant in the application is not possible. The design of the experiment calls for one vessel to participate in the experiment.

2.2.6 Major Products

As required in 50 CFR 679.6, Groundfish Forum will prepare a report on the results of the experiment and make provisions for public release of the data obtained under the EFP. Data analysis and a draft report will be prepared by December 1999. Pending concurrence by the Executive Director and Chairman of the North Pacific Fishery Management Council, the draft report will be presented to the Council's Scientific and statistical Committee during its December 1999 meeting. A final report is scheduled for completion by February 2000 so that it may be presented to the Council's Advisory Panel and Council during the Council's February 2000 meeting.

3.0 Environmental Consequences of the Alternatives

The groundfish fisheries occur in the North Pacific Ocean and Bering Sea in the U.S. EEZ from 50° N to 65°N. The fishing activity under the EFP would authorize experimental fishing for groundfish in the Bering Sea. Descriptions of the affected environment are given in the FSEIS (NMFS 1998a). Substrate is described at section 3.1.1, water column at 3.1.3, temperature and nutrient regimes at 3.1.4, currents at 3.1.5, groundfish and their management at 3.3, marine mammals at 3.4, seabirds at 3.5, benthic infauna and epifauna at 3.6, prohibited species at 3.7, and the socioeconomic environment at 3.10. Additionally, the status of each target species category, biomass estimates, and acceptable biological catch specifications are presented both in summary and in detail in the annual BSAI stock assessment and fishery evaluation (SAFE) report. The

projections for fishing year 1999 are contained in the 1998 SAFE report (NPFMC 1998).

An environmental assessment (EA) as described by the National Environmental Policy Act (NEPA) of 1969 is used to determine whether the action considered will result in significant impact on the human environment. If the action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) will be the final environmental documents required by NEPA. If the analysis concludes that the proposal is a major Federal action significantly affecting the human environment, an environmental impact statement (EIS) must be prepared.

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 fishing practices, e.g., effects of gear use and fish processing discards; and 3) entanglement/ entrapment of non-target organisms in active or inactive fishing gear.

An analysis of the effects of groundfish fishing on the ecosystem, social, and economic environment is contained in the FSEIS (NMFS 1998a). This analysis displays only those effects that are additional and attributable to the harvest of groundfish necessary to conduct the EFP and which are authorized outside the annual TACs approved for 1999. The environmental issues include potential impacts on the environment as a result of these additional harvest amounts. The amounts of fish harvested under the EFP will not result in the attainment of the overfishing level for any species of groundfish. The economic issues include allocative ramifications that could be perceived through additional harvest of prohibited species (crab, halibut) that are fully utilized in other directed fisheries.

3.1 Anticipated Groundfish Mortality

The EFP proposal estimates that 925 mt of groundfish are necessary to conduct parts I and II of the experiment and 342 mt of groundfish are necessary for part III. The expected species composition (principle components) of this groundfish allocation is presented in Table 1 of this EA and is based on observer data during the 1997-98 flathead sole and Greenland turbot fisheries.

For the 10 different groundfish species/species groups listed in Table 1, the 1999 TACs were set equal to the 1999 acceptable biological catch (ABC) levels except for arrowtooth flounder, yellowfin sole, and Greenland turbot which had TAC levels set below ABC (NMFS 1998b). Thus, the estimated catches for the 7 remaining species/species groups could exceed the TAC as well as the ABC specified for that species, if the TAC is fully harvested in the directed fisheries. Of these 7 species/species groups, the TAC could potentially be exceeded, but only by less than 1 percent (Table 3). Table 3 displays 1999 TACs and actual landings for the species in question through late June. TACs for all species are set well below the overfishing levels (OFLs). The ABC is a preliminary description of the acceptable harvest (or range of harvests) for a given stock

or stock complex. Its derivation focuses on the status and dynamics of the stock, environmental conditions, other ecological factors, and prevailing technological characteristics of the fishery (NPFMC 1998). The ABC is a conservatively developed scientific estimate used by the Council and NMFS for monitoring the health of the stock. ABCs are developed by the appropriate plan team and are recommended to the Council for its consideration in the annual determination of TACs. NMFS inseason management objectives are to manage conservatively and thereby avoid the overfishing of any fish stocks or stock complexes.

Table 3. 1999 harvest specifications and catch amounts for species projected to be harvested under the EFP 99-03.

Species	OFL	ABC	TAC	EFP (mt)	TAC + EFP	Potential EFP mt/TAC (%)	Exceed ABC?	Exceed OFL?	Estimated catch thru 6/24/99	% TAC harvested
Flathead sole	118,000	77,300	77,300	212	77,512	0.27425614	yes	no	7,356	9.5161708
Arrowtooth flounder	219,000	140,000	134,354	280	134,634	0.20840466	no	no	3,509	2.611757
Yellowfin sole	308,000	212,000	207,980	93	208,073	0.0447158	no	no	45,654	21.951149
Pacific cod	264,000	177,000	177,000	93	177,093	0.0525424	yes	no	130,964	73.99096
Pollock (Bering Sea)	1,720,000	992,000	992,000	91	992,091	0.009173	yes	no	400,000	40.322581
Other flatfish	248,000	154,000	154,000	82	154,082	0.0532468	yes	no	11,410	7.4090909
Rocksole	444,000	309,000	120,000	47	120,047	0.0391667	no	no	34,602	28.835
Other species	129,000	32,860	32,860	203	33,063	0.61777237	yes	no	12,435	37.842362
Sablefish (Bering Sea	2,090	1,340	1,340	10	1,350	0.74626866	yes	no	170	12.686567
Greenland turbot	29,700	14,200	9,000	175	9,175	1.94444444	no	no	1,939	21.544444

ABC would be exceeded only if the TAC was fully harvested
Source: NMFS 1999 BSAI final TAC specifications (64 FR 12103, March 11, 1999) and 1999 preliminary catch reports.

The EA prepared for the 1999 groundfish specifications (NMFS 1998b) considered the environmental effects of fishing within the specified TAC and ABC levels and concluded that fishing within these levels would not threaten groundfish stocks or species dependent on them. The fishing conducted under the EFP would be additional harvest amounts in excess of the 1999 TACs. One other EFP has been issued by NMFS in 1999 (EFP 99-02) that authorized additional amounts of BSAI groundfish to be harvested in an experimental hook-and-line gear fishery for Pacific cod.[1] This EFP 99-02 authorized the harvest of 1,652 mt of groundfish with non trawl gear, 80 percent of which is anticipated to be Pacific cod. However, total estimated groundfish removals under both EFP 99-02 and the subject EFP 99-03 would not exceed the overfishing levels already considered in EA for the 1999 specifications. Further, TAC amounts typically are not fully harvested, particularly for flatfish species, due to other fishery constraints such as prohibited species bycatch restrictions or market conditions. Conversely, pollock and Pacific cod TACs typically experience a greater likelihood of being harvested. Given these considerations and the amount of fish projected to be harvested under the EFP, fishing activity under the EFP would not threaten the affected groundfish stocks or species that depend on them.

3.2 Anticipated Prohibited Species Mortality

The groundfish harvest by vessels using trawl gear in the BSAI groundfish fishery may be limited by prohibited species catch (PSC) limits that are established annually by the Council in its TAC specification process and implemented by regulations at 50 CFR section 679.21. PSC limits are established for Pacific halibut, Tanner crab (C. bairdi and C. opilio), red king crab, salmon and herring. The latter two species are not expected to be taken in fishing activities authorized under the EFP.

For 1999, the Pacific halibut bycatch mortality PSC limit for the open access trawl BSAI groundfish fisheries is 3,492 mt. It is expected that the catch of 1,267 mt of groundfish authorized for the EFP under alternative 2 could result in 28.7 mt of Pacific halibut bycatch. This estimate is consistent with historic information as reviewed by NMFS which was based on data from the NMFS Groundfish Observer Program and the fishing industry. The overall mortality associated with this bycatch would be less than the bycatch based on anticipated survival of halibut caught during part III of the experimental fishery.

The anticipated Pacific halibut bycatch amount is typical of what would occur in the open-access fishery and does not represent a significant amount relative to the Pacific halibut bycatch mortality limit of 3,492 mt for the open access trawl fisheries. In 1998, the Pacific halibut bycatch mortality PSC limit for trawl BSAI groundfish fisheries was 3,492 mt of which 3,432 mt of mortality was taken (98 percent). As of late June 1999, the trawl fishery has taken 2,513 mt of

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[1] Environmental assessment for exempted fishing permit 99-02. To test the effectiveness of seabird avoidance measures used on catcher-processor vessels using hook-and-line gear to fish for Pacific cod in the Bering Sea and Aleutian Islands management area. NMFS, Alaska Regional Office. May 1999.

the annual PSC limit. The additional 28.7 mt of Pacific halibut bycatch mortality that would be authorized by the EFP under Alternative 2 is in addition to the amount authorized in the Final 1999 Harvest Specifications for the BSAI. This additional mortality would not have an impact on the healthy halibut resource, which currently is supporting near record commercial harvest levels (35,590 mt in 1997) (NMFS 1998a). Further, total annual halibut mortality from all sources, including estimated bycatch mortality in commercial and experimental fisheries, is considered by the International Pacific Halibut Commission when annual quotas are established for the setline halibut fisheries. Increased halibut bycatch mortality could result in decreased halibut allocations to the directed halibut fishery. However, the small amount of additional halibut bycatch mortality associated with EFP 99-03 is not expected to impact in any discernable manner the amount of halibut that will become available to the directed halibut fishery in future years.

The projected crab bycatch also is non significant relative to total abundance and harvest removals in target and non target fisheries. In 1998, only 46 percent of the C. bairdi PSC limit specified for Bycatch Zone 2 was taken and 61 percent of the C. opilio PSC limit was taken by vessels using trawl gear. The respective PSC limits for these species in 1999 are 1,878,000 C. bairdi crab and 4,5000,000 C. opilio crab, of which the projected bycatch under the EFP represents only 0.2 and 0.3 percent of the specified PSC limits authorized for the 1999 trawl fisheries. Given these small amounts and the fact that trawl fisheries typically do not harvest the Zone 2 C. bairdi or C. opilio PSC limits, the additional removals under the EFP likely will not result in attainment of the PSC limits specified for 1999.

King crab bycatch limits are not established in regulations for Bycatch Zone 2 where fishing activity under the EFP will be conducted. The projected bycatch amount of king crab is very small (less than 200 crab) and is reflective of the low king crab abundance in anticipated fishing areas and associated low bycatch rates of these species in Bycatch Zone 2.

3.3 Trophic interactions

The marine food-web of North Pacific marine fishes are complex (Livingston and Goiney 1983). Numerous species of zooplankton, phytoplankton, invertebrates, mollusks, crustaceans, forage fish, demersal, mid-water, and pelagic fish, marine mammals, seabirds, and humans combine to comprise the food-web present in the BSAI and GOA. Environmental changes as well as human exploitation patterns can effect changes to trophic interactions. Fishing causes direct changes in the structure of fish communities by reducing the abundance of target or by-catch species, then these reductions may lead to responses in non-target species through changes in competitive interactions and predator prey relationships. Indirect effects of fishing on trophic interactions in marine ecosystems may also occur. Current debates on these topics include comparing relative roles of "top down" (predator) or "bottom up" (environmental and prey) control in ecosystems and the relative significance of "donor controlled" dynamics (in which victim populations influence enemy dynamics but enemies have no significant effect on victim populations) in the food webs (Jennings and Kaiser 1998.)

The additional harvest amounts associated with the EFP are not significant relative to the existing biomass abundance and associated commercial harvest removals of the affected species. The potential benefits that could be derived from the results of the EFP include enhanced estimates of species-specific harvest amounts. To the extent this benefit is realized, overall management of the fishery resources in the North Pacific will be improved and positive impacts on the marine food web will be better accounted for and managed.

Given the relatively small harvest amounts of fish under the EFP, trawl fishing activities under the EFP are not expected to result in a negative impact on fishery resources, marine mammals, or seabirds, or invertebrates in ways that are outside the scope of the FEIS or EA prepared for the 1999 harvest specifications.

3.4 Habitat impacts

Inclusively all the marine waters and benthic substrates in the management areas comprise the habitat of all marine species. Additionally the adjacent marine waters outside the EEZ, adjacent State waters inside the EEZ, 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 fisheries' target species, marine mammals, seabirds, and the ESA listed species. Fishing activities under the EFP will result in the harvest of an additional amount of groundfish (less than 1,300 mt) with trawl gear relative to the 2 million mt of groundfish authorized for harvest under the 1999 groundfish specifications.

3.4.1 Impacts on Essential Fish Habitat

The Magnuson-Stevens Act requires that Federal agencies consult with the Secretary of Commerce[2] with respect to any action "authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat (EFH) identified under this Act" (Section 305(b)(2)). Generally, EFH is defined in the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Specifically, EFH for species managed under the four federal fishery management plans in the Bering Sea and Aleutian Islands area are described and identified in the FMPs themselves and also in the EA prepared for EFH amendments approved January 20, 1999 (NPFMC 1999). These include Amendment 55 to the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area, Amendment 8 to the Fishery Management Plan for the King and Tanner Crab fisheries in the Bering Sea/Aleutian Islands, Amendment 5 to the Fishery Management Plan for Scallop Fisheries off Alaska, and Amendment 5 to the Fishery Management Plan for the Salmon Fisheries in the EEZ of the Coast of Alaska. EFH for many of the species managed under these fishery management plans is located in Bycatch Zone 2 where the experimental fishing activity will occur as authorized under EFP 99-03.

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[2] As represented by NMFS.

Commercial fishing has many effects on EFH for commercial and non-commercial species. This activity removes large amounts of biomass, thus changing the size and sex structure of the target species as well as changing predator-prey ratios. Different types of fishing gear impact EFH in various ways. A brief summary of the impact of trawl gear is described below and is further discussed in EA for Amendment 55 (NPFMC 1999), the SEIS (NMFS 1998a) and the 1999 Groundfish Total Allowable Catch Specification EA (NMFS 1998b).

3.4.2 Trawl Gear Impacts

Although numerous studies on the effects of trawling have taken place in the eastern and western Atlantic, the North Sea, and off Australia, research on the impact of bottom trawling in the BSAI is limited. Since 1996, scientists from the Alaska Fisheries Science Center, NMFS, have conducted research to gain increased knowledge on effects of trawling and studies are ongoing in the BSAI and Gulf of Alaska. A summary of these research efforts can be found in the "Ecosystem Considerations for 1999" chapter of the 1999 SAFE (NPFMC 1998) and in McConnaughey et al (in review)[3]. In summary, these studies indicate that the overall heterogeneity of benthic communities is reduced by bottom trawling and, in some cases, productivity of commercially-important stocks may be affected.

3.4.3 Conclusion

Fishing under this EFP is expected to have similar effects on EFH to those of the commercial trawl flatfish fisheries. However, the amount of fish removed under the EFP is extremely small relative to the commercial fishery and the experiment will be carefully monitored. Because relatively small amounts of fish will be harvested under this EFP, the associated trawl gear impacts are also small because relatively few trawls will occur under this experiment in comparison to the number of trawls that occur in the general commercial fishery within Bycatch Zone 2. Therefore, experimental fishing activity is not expected to adversely impact EFH within the context of the commercial groundfish fisheries authorized under the FMP and the 1999 annual groundfish harvest specifications. It is anticipated that, due to the nature of the experiment, the results of the experiment could provide the basis for better catch information on a species by species basis facilitate the management of fishing activities in the future.

3.5 Impacts on Endangered, Threatened or Candidate Species

The EA prepared for the 1999 groundfish specifications (NMFS 1998b) considered the environmental effects of fishing within the specified 1999 TAC and ABC levels and concluded that fishing within these levels would not threaten groundfish stocks or species dependent on them. The fishing conducted under the EFP could be additional harvest amounts in excess of the

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[3] Robert A. McConnaughey, Kathy Mier and C. Braxton Dew. An examination of chronic trawling effects on soft-bottom benthos of the eastern Bering Sea. In review. Alaska Fisheries Science Center, NMFS, 7600 Sand point Way NE., Seattle WA 98115-0070.

1999 TACs. However, estimated groundfish removals under the EFP likely would not measurably approach or exceed the overfishing levels already considered in EA for the 1999 specifications. Fishing activity under the EFP, therefore, would not threaten the affected groundfish stocks or species that depend on them because estimated total removals under the EFP are very small compared to the overall TACs for these species and would not contribute in a meaningful way to approaching overfishing levels already considered in the EA for 1999 specifications.

None of the alternatives, including fishing activities under the EFP, are expected to affect endangered, threatened, or candidate species or their critical habitat in a manner or to an extent not considered in the EA or in previous Endangered Species Act section consultations on the groundfish fisheries of the BSAI.

3.6 Impacts on Marine Mammals

The EA prepared for the 1999 groundfish fisheries (NMFS 1998b) assessed the effect of the 1999 groundfish fisheries on marine mammals not listed under the Endangered Species Act that may be present in Federal waters off Alaska. That EA considered the environmental effects of fishing within the specified 1999 TAC and ABC levels and concluded that fishing within these levels would not threaten groundfish stocks or species dependent on them. The fishing conducted under the EFP could be additional harvest amounts in excess of the 1999 TACs. However, estimated groundfish removals under the EFP likely would not measurably approach or exceed the overfishing levels already considered in EA for the 1999 specifications. Fishing activity under the EFP, therefore, would not threaten the affected groundfish stocks or species that depend on them because estimated total removals under the EFP are very small compared to the overall TACs for these species and would not contribute in a meaningful way to approaching overfishing levels already considered in the EA for 1999 specifications.

None of the alternatives, including fishing activities under the EFP, are expected to affect marine mammals in a manner or to an extent not considered in the 1999 EA. As a result, NMFS has determined that fishing activities conducted under this EFP would not adversely affect marine mammals.

3.7 Coastal Zone Management Act

Issuance of an EFP to assess observer sampling methodology for species and size composition (the preferred alternative) 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.

3.8 Conclusions or Findings of No Significant Impact

For the reasons discussed above, fishing activity under the approved EFP 99-03 to assess existing and proposed methods of species composition sampling would not significantly affect the quality of the human environment. Therefore, the preparation of an environmental impact statement is not required by section 102(2)(C) of NEPA or its implementing regulations.

This Environmental Assessment tiers off the final SEIS (NMFS 1998a), and the 1999 Groundfish Total Allowable Catch Specification EA (NMFS 1998b).

Gary C. Matlock

for Assistant Administrator for Fisheries, NOAA

AUG 6 1999

Date

4.0 References

Jennings, S. and M. J. Kaiser. 1998. The effects of fishing on Marine Ecosystems. Advances in Marine Biology 34:201-352.

Livingston, P. A., and Goiney, B. J. 1983. "Food habits literature of North Pacific marine fishes: A review and selected bibliography." in *NOAA Technical Memorandum NMFS F/NWC-54* U.S. Department of Commerce, NOAA. 81 p.

National Marine Fisheries Service (NMFS). 1998a. Final Supplemental Environmental Impact Statement: Groundfish Total Allowable Catch Specifications and Prohibited Species Catch Limits Under the Authority of the Fishery Management Plans for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Groundfish of the Gulf of Alaska. December 1998. National Marine Fisheries Service, P.O. Box 21668, Juneau, Alaska 99802. 692 pp + Appendices and Comments.

NMFS. 1998b. Environmental Assessment for 1999 Groundfish Total Allowable Catch Specifications Implemented under the Authority of the Fishery Management Plans for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Groundfish Fishery of the Gulf of Alaska Area. (December 24, 1998, FONSI signed December 24, 1998.) Available from NMFS Alaska Regional Office, P.O. Box 21668, Juneau, AK 99801. 45 pg.

North Pacific Fishery Management Council (NPFMC). 1998. "Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Bering Sea/Aleutian Islands Region as Projected for 1999." Compiled by the Plan Team for the Groundfish Fisheries of the Gulf of Alaska, North Pacific Fishery Management Council, 605 West 4th Avenue, Suite 306, Anchorage, AK 99501.

NPFMC. 1999. Environmental Assessment for Amendment 55 to the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area, Amendment 55 to the Fishery Management Plan for Groundfish of the Gulf of Alaska, Amendment 8 to the Fishery Management Plan for the King and Tanner Crab Fisheries in the Bering Sea/Aleutian Islands, Amendment 5 to the Fishery Management Plan for Scallop Fisheries off Alaska, and Amendment 5 to the Fishery Management Plan for the Salmon Fisheries in the EEZ off the Coast of Alaska. Essential Fish Habitat. North Pacific Fishery Management Council. 605 West 4th Ave., Suite 306, Anchorage, AK 99501-2252. January 20, 1999.

5.0 List of Preparers

Sue Salveson
Alaska Region, NMFS
Division of Sustainable Fisheries
Juneau, AK

6.0 List of Agencies and Individuals Consulted

Bill Karp and Sarah Gachias
Alaska Fisheries Science Center, NMFS

John Gauvin
Groundfish Forum, Inc.
4215 21st Ave. W.
Seattle, WA 98199