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

SEP 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 (99-04) to Test Artificial Bait Fabricated from Alaska Pollock Offal

LOCATION: Federal waters in the Gulf of Alaska

SUMMARY: This Environmental Assessment addresses an exempted fishing permit (EFP) application submitted by the Alaska Fisheries Development Foundation (AFDF), under 50 CFR 679.6. The EFP application was received by the National Marine Fisheries Service on April 19, 1999, and reviewed by the Alaska Fisheries Science Center and the North Pacific Fishery Management Council. The Council considered and approved the application during its June 1999 meeting. During Phase 1, the applicants developed and successfully tested the artificial bait, which consists of pollock wastes embedded into a patented matrix, in mini-field trials in Puget Sound and Alaska. Approval of the EFP would allow AFDF to compare its artificial bait to natural bait in terms of catch rate, species caught, size of fish caught, length of soak time, and other parameters.

RESPONSIBLE OFFICIAL
Steven Pennoyer
Administrator, Alaska Region
National Marine Fisheries Service
P.O. Box 21668
Juneau, AK 99802
Phone: 9907-586-7642

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, OPSP, Room 5805, U.S. Department of Commerce, Washington, D.C. 20230.

Sincerely,

Margaret McCall

for Susan Fruchter
NEPA Coordinator

Enclosure

ENVIRONMENTAL ASSESSMENT
FOR
EXEMPTED FISHING PERMIT #99-04

TO TEST A NEW FUNCTIONALLY ENHANCED ARTIFICIAL BAIT FOR LONGLINE FISHERIES IN THE GULF OF ALASKA

July, 1999

Lead agency: National Marine Fisheries Service
Alaska Regional Office
Juneau, Alaska

Responsible Official: Steven Pennoyer
Regional Administrator
Alaska Regional Office

For Further Information Contact:
Nina Mollett
Alaska Regional Office
National Marine Fisheries Service
P.O. Box 21668
Juneau, AK 99802
(907) 586-7642

Abstract: This Environmental Assessment analyzes the potential effects on the environment of issuing an Exempted Fishing Permit to the Alaska Fisheries Development Foundation to test artificial bait under commercial fishing conditions. During Phase 1, the applicants developed and successfully tested the artificial bait, which consists of pollock wastes embedded into a patented matrix, in mini-field trials in Puget Sound and Alaska. They now are proposing a project including field and laboratory trials to improve the bait and determine how effective the artificial bait is compared to bait traditionally used in the longline fisheries.

Executive Summary

The Alaska Fisheries Development Foundation (AFDF) has requested an Exempted Fishing Permit (EFP) to conduct an experiment to test artificial bait, consisting of offal from processed pollock which is pressed into a matrix developed and patented by MARCO Marine. Phase 1 of the experiment, which tested the attractiveness of the bait to captured Pacific cod, was successfully completed. Phase 2 will involve field testing under commercial conditions in the Gulf of Alaska.

This Environmental Assessment (EA) examines the EFP application for its environmental consequences. Under Alternative 1, No Action, the applicants would not be given permission to take fish outside the total allowable catch (TAC) and would be required to conduct their experiment during the commercial fishing season. This would entail two problems: it would delay the experiment for several months; and owners of longliner vessels would probably be unwilling to charter their vessels to researchers during the fishing season.

Under Alternative 2, AFDF would be given an EFP valid from mid-July, 1999 to October 31, 1999 and would be allowed to fish for up to 24 days under the permit. They would be limited to 9.45 mt (20,800 lbs) of Pacific Cod and up to 0.5 mt (1100 lbs) of rockfish, including any rockfish species. Other species are expected to be caught, but only very small amounts will be in the mix, no formal limit is being placed on these. Incidental catch of Pacific halibut would allowed under the EFP, so long as the catch could be accounted for within the chartered vessel's 1999 Individual Fishing Quota (IFQ). The applicants would be required to submit a full report of their experiment to NMFS by February, 2000, including complete data on all fish, bird and invertebrate species taken, along with AFDF's analysis and findings. They also would be required to make arrangements with the Executive Director of the North Pacific Fishery Management Council (Council) to present their findings to the Council.

The EA concludes that there will be no significant impacts to the human environment from issuing this EFP. The amount of fish requested is quite small in relationship to the TAC for Pacific cod in the GOA, and since the experiment is designed to duplicate normal commercial fishing conditions, any environmental consequences would be similar to those in the commercial fishery. Environmental consequences of longline fishing in the Gulf of Alaska are discussed in more depth in the Alaska Groundfish Supplemental Environmental Impact Statement (SEIS) (NMFS 1998a) and the 1999 Groundfish Total Allowable Catch Specifications EA (NMFS 1998b).

Table of Contents

1.0 Introduction

The groundfish fisheries in the exclusive economic zone (EEZ) (3 to 200 miles offshore) of the GOA are managed by NMFS under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The mission of NMFS[1] is the stewardship of living marine resources for the benefit of the nation through science-based conservation and management, and promotion of a healthy marine environment. The goals for accomplishing this mission are: to build and maintain sustainable fisheries; to aid in the recovery of protected species; and to protect, conserve, and restore living marine resource habitat and biodiversity. Guidance for achieving these goals is taken from relevant Federal legislation.

The groundfish fisheries are managed under the Fishery Management Plan (FMP) for Groundfish of the Gulf of Alaska, developed by the North Pacific Fishery Management Council (Council) under the Magnuson-Stevens Act. The plan was implemented in December 1978 and underwent a thorough revision in October 1994. Since then it has been amended over 20 times.

This EA addresses an Exempted Fishing Permit (EFP or EFP #99-04) application by the Alaska Fisheries Development Foundation, Inc. (AFDF) to conduct a study in the GOA near Seward, Kodiak, or Sitka,[2] with the goal of developing and testing artificial bait, fabricated from Alaska seafood offal, for the longline fishery.

Under regulations implementing the FMP at 50 CFR sections 679.6 and 600.745, the Regional Administrator, after consulting with the Council, may authorize fishing for groundfish, for limited experimental purposes, in a manner that would otherwise be prohibited. In addition 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).

NEPA requires a description of the purpose and need for the proposed action as well as a description of alternative actions which may address the problem. This information is included in Sections 1 and 2 of this document. Further background information on the proposed permit is contained in Section 3. Section 4 contains information on the biological and environmental consequences of the alternatives, as required by NEPA. This includes a discussion of the anticipated mortality of groundfish and halibut. It also includes an analysis of the likely effects on essential fish habitat (EFH) and on endangered species and marine mammals.

1.1 Purpose of and Need for Action

The purpose of this EFP, as stated in the proposal by AFDF (1998), is to transform some of the

---

[1]The mission statement and goals are paraphrased from the NOAA Fisheries Strategic Plan (NOAA 1997).

[2]AFDF determined subsequent to writing of this EA that the first phase of the experiment would be conducted near Seward, and that the second phase is likely also to be in Seward or Kodiak; it is therefore likely that the entire experiment will be conducted in statistical and reporting area 630 (pers. comm., Richard Drake, AFDF project manager, July 08, 1999).

large quantities of seafood processing wastes generated in Alaska into usable bait. Normally, in the many communities in Alaska that are not equipped to process seafood, the offal is ground and pumped out to sea. It cannot be readily used for bait since it is in semi-liquid form after processing, and only an intact chunk of flesh will stay on the hook. AFDF proposes[3] to alter the size and texture of the pollock offal using a matrix developed and patented by MARCO Marine (a company which designs and manufactures fishing gear and automatic baiting machines) so that the offal, which contains oils and other attractants for fish, can be used as bait.

AFDF sees both environmental and socioeconomic benefits accruing from its project, which if successful will lead to the substitution of artificial bait for much of the natural bait that is currently used. Potential environmental benefits include:

1. Recycling offal that is currently being dumped into the ocean into an economically productive use;
2. Reducing fishing pressure on species which are also used for human consumption, such as squid and herring;[4]
3. Potentially increasing the ability to target species and size of fish desired, thus lowering bycatch and discard rates. AFDF cites Norwegian researchers Løkkeborg and Bjordal (1992) in claiming that bait type may be the most important gear factor affecting species and size selectivity.

Potential socioeconomic benefits include:

1. The creation of Alaskan jobs in producing the artificial bait, and money brought into Alaska through sale of artificial bait. Most natural bait is currently bought out of state.
2. Cost savings from bait that is less subject to loss, can continue to attract fish for longer periods underwater, and is more consistent in quality–frozen bait, bought sight unseen, is sometimes rotten, and often natural bait is lost when it is cut into pieces that are the wrong size;
3. Cheaper bait–AFDF anticipates that their bait will be less expensive by 15-20 percent (AFDF 1997);
4. Higher catch rates, if artificial bait indeed proves more successful in attracting fish than natural bait;
5. Improved safety, in that uniform sized bait will be less likely to cause problems in automatic bait machines.

The experiment is being funded by the Alaska Science and Technology Foundation and is being carried out by collaboratively by AFDF, the Center for Applied Regional Studies (a research center in Cambridge, Massachusetts) MARCO Marine, and the Wildlife Conservation Society (a

---

[3]Letter to Steve Pennoyer, NMFS Alaska Regional Administrator, from Richard Drake, April 15, 1999.

[4]"We believe that the time is right to stop making bait from human food and start making it out of the wastes from human food production" (AFDF 1997).

research division of the Bronx Zoo in New York).

Phase 1 of the project involved developing the artificial bait and testing it in mini-field trials in Puget Sound and Alaska. The group's Phase 1 results were successful, according to AFDF's report to the Alaska Science and Technology Foundation (1998). Many fish species, including Pacific cod, took the bait, which remained effective after being submersed as long as eight hours. The final report for Phase 1 was submitted in January 1999 to the Alaska Science and Technology Center, which funded the experiment.

1.2 Related NEPA Documents

This EA tiers off: (1) 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; (2) the 1999 Groundfish Total Allowable Catch Specifications EA (NMFS 1998b); and (3) the EA for the EFH amendments to the Alaska Region FMPs (NMFS 1999).

2.0 Alternatives Including Proposed Action

2.1 Alternative 1: No Action

An EFP would not be issued. Under this alternative, experimentation done by AFDF on artificial bait would have to occur at times when directed fisheries are open, under regulations at 50 CFR 679.

An advantage of this alternative is that no additional fish would be harvested above the TAC for Pacific cod and no incidental catch would be taken above the incidental catch allotted to the commercial fishery under NMFS' 1999 GOA harvest specifications (64 FR 12094).

However, two problems exist with such a requirement. First, longline vessel owners are not likely to be willing to participate during the commercial fishing season, since compliance with the experimental design, and collection of the necessary data, could slow down fishing effort, making the vessel less competitive in the open access fishery.

The second problem has to do with timing. The project was broken into two phases at the request of the Alaska Science and Technology Foundation, which is funding it. Approval of phase 2 occurred in mid-February, 1999, and preparations for Phase 2 could therefore not proceed until then.[5] According to AFDF, preparations–which include ordering field trial supplies, constructing an underwater video camera frame, hiring a vessel, and making enough

[5]Pacific Cod fishing by the inshore component closed in Area 630 and 620 on March 14, 1999 and in area 610 on March 8. All directed fishing for groundfish with hook and line gear in the GOA, with the exception of sablefish and DSR, closed on April 24. Pollock trawling in area 630 of the GOA opened Jan 20, closed Jan 27, reopened June 1, and closed June 10. Pers. comm., Andy Smoker, NMFS Alaska Region Senior Inseason Manager .

artificial bait for the experiment–could not be completed in time for the 1999 commercial fishery. The artificial bait requires fresh pollock offal, which AFDF intended to obtain from the June 1 pollock season.[6] If AFDF were now required to run the experiment during the commercial fishing season, their project would be delayed by several months.

2.2 Alternative 2 (Preferred)

Issue the proposed EFP to the Alaska Fisheries Development Foundation to test artificial bait under commercial fishing conditions between July and October, 1999. NMFS would authorize the harvest of 9.45 mt of Pacific Cod (20,800 lbs) of Pacific Cod and 0.5 mt (1,100 lbs) of any rockfish species. Incidental catch of Pacific halibut would be authorized so long as the catch could be accounted for by the chartered vessel's 1999 IFQs. AFDF would be required to report to the Regional Administrator if any of these limitations were approached, and would be required to submit a full report of their experiment to NMFS by February, 2000. The report must include complete data on all fish, bird and invertebrate species taken, along with AFDF's analysis and findings. AFDF would also be required to make arrangements with the Executive Director of the North Pacific Fishery Management Council (Council) to present its findings to the Council.

3.0 Background

Longline fishermen in Alaska use natural bait, which often must be shipped into the state. Meanwhile, huge quantities of offal from seafood processing is often ground and pumped out to sea, especially in coastal communities that are inadequately equipped (or not set up at all) to process byproducts. Although this raw waste contains oils and attractants which might make it useful for bait, it isn't solid enough to stay on a hook. The proposed experiment involves incorporating the offal into a matrix that will enable it to stay on a hook, and also to treat it so that its power as an attractant is increased.

Developing bait with these qualities should theoretically be feasible, as size and texture can be altered fairly readily in processing. As stated in AFDF's research plan (1998), "In an era where human foods are enriched, processed, flavor-enhanced, functionally altered and niche-marketed, it is surprising that so little work has been done on baits."

Artificial bait has been tested to some extent in the past. Artificial bait for pot fisheries have been used, but the requirements there are somewhat different; the bait must remain attractive for long periods of time and does not have to be swallowed by the targeted animal, so that rawhide soaked in fish oil, for example, can be effective. Longline bait cannot be as high priced as pot bait and must be edible. Previous experiments with artificial longline baits have involved filling nylon bags with minced raw fish and impregnating polyurethane with feeding attractants that occur in natural bait (Løkkeborg 1990; 1991). Generally, the binder, reinforcement, and attractant have been prohibitive in cost or presented other problems (AFDF 1997). One

[6]Pers. comm., e-mail, Richard Drake, June 6, 1999.

commercial artificial bait, "Norbait," has been developed and is being manufactured by Norbait A.S., a joint venture of Mustad and Pronova in Norway. Norbait is not made of waste products, but instead consists of minced herring or other fish that it mixed with a binding jelly and squeezed into a fiber mesh tube. It can be frozen and is supplied to vessels in 15 meter lengths, sometimes precut. Its manufacturers claim that it increases baiting rates, cleaning rates, and catch rates. AFDF is watching the Norbait situation for information on the potential market demand for artificial bait (AFDF 1997).

The artificial bait developed by AFDF and MARCO requires no retrofitting and can generally be used like natural bait. It must be kept frozen until used. When it thaws out, like natural bait it releases molecules that attract fish. Gradually these molecules are used up, as also happens with natural bait. Different kinds of natural bait vary in "soak time"–how long they continue to attract fish. Squid is highly valued as bait, for example, because of its long soak time. One of AFDF's goals is to engineer a long soak time into their product, and Phase 1 of their experiment was successful in this regard (AFDF 1998).

Experiments have shown that many factors affect how well different types of bait catch fish of different species. These factors include differences in the chemical attractants and the rate at which the attractants are emitted, in the size and texture of the bait, in the size and shape of the hook, and in times of the sets (Løkkeborg and Bjordal 1989, Løkkeborg 1990, Woll et al 1998). The ability to catch fish is also affected by the attractiveness of the bait to birds, starfish, hagfish, crab, and other scavengers (Løkkeborg and Bjordal 1992).

MARCO Marine began its artificial bait project in 1986 and has spent close to $450,000 on research, design and testing of different matrices, developing release rate mechanisms, filing domestic and foreign patents, setting up two pilot plants, producing bait samples for testing, and conducting small-scale fishing tests in aquariums and at sea (AFDF 1997). One of the company's goals is to develop bait that is species specific–for example, bait that would be attractive to Pacific cod but not to halibut. This goal however will not be achieved through the proposed EFP, since the bait that has been developed for this project is attractive to cod, halibut, and other species.

In its analysis of the North Pacific longline bait market in 1991, MARCO estimated that between 19 and 20 million pounds of bait was used annually by the 200 crabber/tender/longliners, 50 schooners, 400 seiners, 140 house vessels, and 40 small gillnetter/trollers in the fleet, assuming one ounce of fish per baited hook, and no wastage (AFDF 1997). Although the IFQ program has cut down on the number of boats, AFDF estimates that the market would still be about the same, since the same number of fish are caught. At current prices of $.40 to $.60/lb for bait, this represents a market of $8 to $12 million. AFDF estimates the factory ship bait market at about $3.5 million, for a total of about $13 to $15 million for the longline fleet. They believe that a pre-sliced, uniformly sized, fabricated bait of dependable quality might be more attractive to longliners than the traditional fish and squid, and that such bait would be 15-20 percent cheaper per hook. The bait would be useful both to hand baiters and automatic baiters; MARCO has

patented apparatus to feed artificial bait to automatic baiters, which would make them easier to use.

Phase 1 and Prior Results

Prior to Phase 1, mini-field trials were conducted by MARCO Marine in Puget Sound and Alaska which, according to AFDF,[7] demonstrated that "properly digested" pollock waste embedded into the MARCO matrix was acceptable to numerous fish species, including Pacific cod.

Phase 1 of the project involved two 800 gallon tanks, which were supplied with flow-through seawater from one end of the 12 foot long, 4 foot wide, 4 feet deep tank to the other. One Pacific cod at a time was placed by net in one end of the tank, with liquid attractants or solid bait at the other end. Trials lasted 15 minutes for liquid attractants, and half an hour for solid bait, which takes longer to disperse its attractants. Liquid attractants were pumped through a silicone tube with a horizontal nipple at its lower end; a fish's motion in touching it would activate an electrical switch which rang a bell. Pieces of solid bait, instead of being placed in a tube, were pierced by a clasp and hung on a monofilament line. When the fish touched the bait, a switch was activated and a bell rang.

The experimenters hoped to capture 30 to 40 Pacific cod and only to use each fish once because animals in captivity adapt to their environment and respond differently than wild animals, but found it difficult to keep the fish alive during capture and captivity and wound up using only five fish. The fish were used more than once, and the experiments were planned so as to obtain the maximum amount of fish from the minimum number of experiments (AFDF 1998).

Attractants using fish offal, and manufactured by two different methods, were used in six trials. It was found that one method gave substantially better results than the other, and the positive results for the more successful method held when the two types of attractant were embedded in the MARCO matrix.

For the solid bait experiments, the bait was presoaked for either one hour or eight hours. The control bait was cut herring. After one hour of presoaking, the herring and artificial bait were roughly comparable in their attractiveness to the four fish tested. After eight hours of soaking, only one out of three fish tested showed any interest in the cut herring, while all three fish tested with the artificial bait were fascinated by it.

The conclusion of the experimenters is that the synthetic bait prepared by one of the two methods tried appears attractive to Pacific cod under laboratory conditions, whether presented as pure liquids or embedded in the MARCO matrix. The attraction is greater after eight hours than one hour of presoaking. The project was successful enough to attract continued funding by the Alaska Science and Technology Foundation for Phase 2 field trials.

---

[7]Letter to Dr. Richard Marasco, NMFS, from Chris Mitchell, AFDF, requesting EFP, April 15, 1999.

Phase 2 Goals

Phase 2 of the experiment would combine field and laboratory studies. AFDF's goals for phase 2 are to observe Pacific cod behavior, in their natural environment, approaching and ingesting artificial and natural baits attached to hooks; to observe scavenger behavior under the same conditions; and to refine and improve the artificial bait.

Specific, measurable objectives, are: to determine the differences in catch rates of Pacific cod and bycatch species, using artificial and natural bait; to evaluate differences in species composition of hooked fish for artificial and natural bait; to determine how long each type of bait continues to attract and catch fish; to compare bait loss between the two types; to compare hooking locations–swallowed or in the mouth; and to perform size-selectivity analyses (AFDF 1998).

The sample size for the first of the two Phase 2 trials will be small, and not designed to achieve statistical significance, but rather to determine whether Pacific cod and other species take the bait under natural conditions, and to improve the bait and the experimental design before proceeding to the second trial.

Phase 2 Methods

AFDF plans to conduct fieldwork on board a commercial longline vessel under 60' in length, and will decide the specific vessel, port, and dates of operation after comparing bids. They anticipate conducting the experiment during the summer and early fall of 1999, near Seward, Kodiak, or Sitka, Alaska. AFDF plans one eight-day trip for phase 2a, probably in late July. The vessel will be guaranteed a fixed income, and AFDF is requesting that catches be retained and used to partially offset the charter costs. The costs are expected to exceed the revenue from selling the fish. Projected charter costs are 20 days at $1,000 per day. At the maximum estimate of 20,800 lbs of Pacific cod, and the better price of $.40 per pound, maximum revenue would be $8320, $11,680 short of the charter costs. [8]

In phase 2a, two to four sets will be made per day, in the morning, with four strings of longlines, each consisting of four skates and 200 hooks. The majority will be fished for 4-6 hours, with occasional 6-8 hour tests. Herring and artificial bait will be fished on the same longline, alternating types every ten hooks.

Hook timers (devices capable of recording up to 99-hook motions per minute over any period of time) will be used on one longline set per day, during long soaks. The timers can detect whether fish are attacking the bait but not being hooked, scavengers are taking bait, or fish are being hooked and then lost. The timers can be used to compare catch over time and the success of hooking rates between bait types. Temperature-depth-time recorders will also be used, to determine fishing time on the bottom.

[8] Pers. comm. June 16, 1999, Richard Drake.

Underwater video observations will be made twice daily for two hours each period, to observe fish behavior with artificial and natural bait and to interpret the data recorded by the hook timers.

In phase 2b, a boat will be chartered for 16 days, probably in September, in order to obtain the 12 days minimum fishing time that the applicants think is necessary to satisfy the objective of obtaining a meaningful and perhaps statistically significant answer to the question of whether different bait types produce different catch rates (AFDF 1998). The arrangements for chartering will be similar to phase 2a. Again, two to four sets will be employed each day using four complete strings of longlines, using alternating sets of ten natural and ten artificial pieces of bait. Soaking duration will alternate between 4 hour soaks (short) and eight hour soaks (long). Hook timers, temperature-depth-time recorders, and underwater video observations will be used to obtain and interpret data.

Data collected prior to each set, and while recovering gear, will include vessel location, time, date, set number, set direction, beginning and ending set time, bottom depth, wind speed, swell height, chop height, presence of birds, etc. While hauling in the gear, data collected will include the bait type, hook number in the sequence, presence of hook timer, bait status when nothing is caught (bait intact, partially gone, lost, hook lost, gangion entanglement), species caught, and hooking location.

Statistical tests will be used to determine whether there are significant differences in catch per unit effort (CPUE) between bait types. The methodology AFDF intends to use is detailed in the research plan (AFDF 1998).

4.0 Environmental Consequences

The groundfish fisheries occur in the North Pacific Ocean and Bering Sea in the U.S. EEZ from 50° N to 65°N (Figure 1). EFP #99-04 would affect groundfish fishing in statistical areas 630 or 650, as the proposal is to conduct fishing near Seward (area 630), Kodiak (area 630) or Sitka (area 650).[9] Descriptions of the affected environment are given in the SEIS (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 GOA stock assessment and fishery evaluation (SAFE) reports. The projections for fishing year 1999 are contained in the 1998 SAFE report for the GOA (NPFMC 1998).

An EA is required by NEPA to determine whether the action considered will result in a 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

[9] See Footnote 2 on page 2.

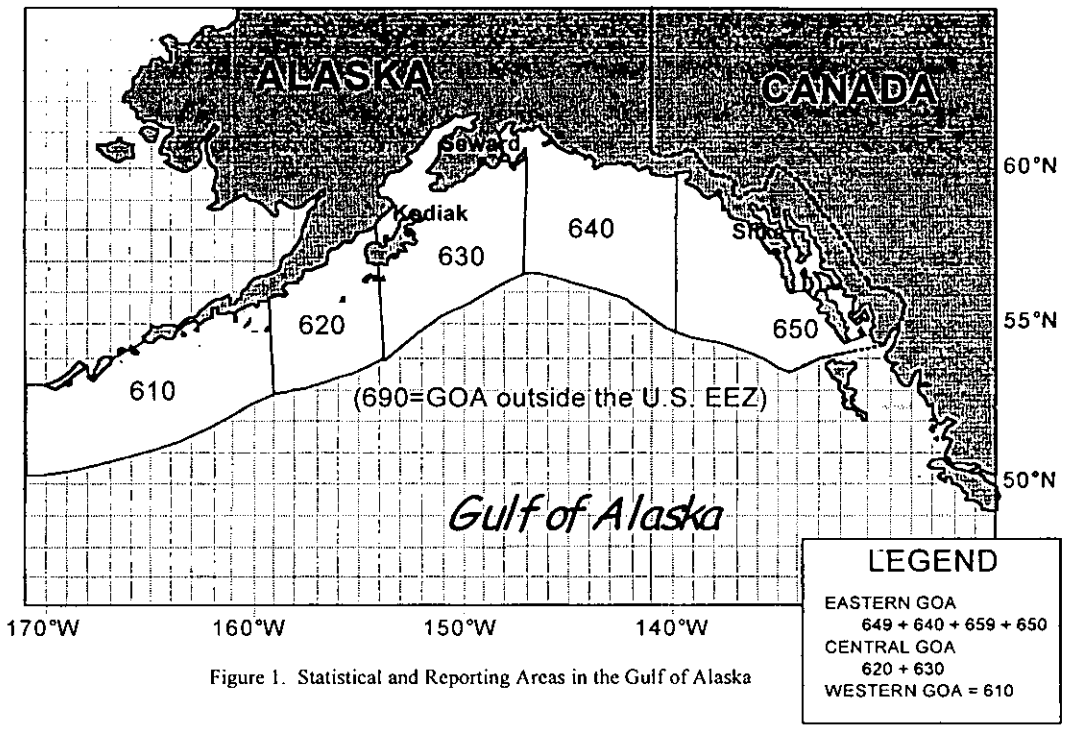

Figure 1. Statistical and Reporting Areas in the Gulf of Alaska

impact (FONSI) are 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 result 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 SEIS (NMFS 1998a). This EA addresses additional effects that could be expected from the proposed fishing activity, which involves taking Pacific cod and associated bycatch outside their TACs.

4.1 Anticipated Groundfish Mortality

The EFP proposal estimates that 10,400-20,800 lbs (4.72-9.45 mt) of Pacific cod is designed to duplicate the activities of a commercial longline vessel targeting Pacific cod. The estimate is predicted on 20 fishing days, with two to four sets per day, each set consisting of 200 baited hooks, and assuming one cod for every five hooks. The proposal further estimates taking 520-1,040 lbs (0.24-0.47 mt) of red rockfish[10] and 4,000-12,000 lbs (1.82-5.45 mt) of halibut.

The amount of Pacific cod requested is small in relationship to the TAC for Pacific cod in the GOA (see Table 1 below). The 9.45 mt which would be granted under this permit amounts to only 0.014 percent of the TAC for the GOA. If the fishing takes place near Kodiak or Seward, in the central GOA, the relevant comparison would be to the TAC for the central GOA; if it takes place near Sitka, the comparison would be to the TAC for the eastern GOA. Nine and a half metric tons represents 0.02 percent of the TAC for the central GOA, and 0.74 percent of the TAC for the eastern GOA.

Table 1. 1998 ABCs[1] and TACs for Pacific cod in the GOA.

	ABC	TAC
Western GOA	29,540	23,630
Central GOA	53,170	42,935
Eastern GOA	1,690	1,270
TOTAL	84,400	67,835

[1] Acceptable biological catch.
[2] data from the Final 1999 Harvest Specifications for Groundfish in the GOA, at 64 FR 12904-12102.

To predict the species mix likely to be caught under the EFP, NMFS blend data from the 1998 hook-and-line shoreside Pacific cod directed fishery (Table 2) was analyzed, along with observer data. The observer data did not prove helpful since catcher vessels under 60' LOA are not required to carry observers, and no observer data exists from these vessels fishing in area 650.

If AFDF catches the maximum Pacific cod in the preferred alternative, 9.45 mt, then if the species mix conforms to the same ratios as in the blend data for areas 630 and 650, the catch expected would be roughly in the amounts shown in Table 3. Judging from this data, it seems likely that the catch of "other rockfish" could easily exceed the catch of red rockfish, and it also appears that the 0.47 mt of red rockfish estimated by AFDF in their proposal may be excessive if

[10] "Red rockfish" is a term used in the AFDF proposal but is not a technical term used in Alaska's fishery management plans. For the purposes of this EA, "red rockfish" will be defined to include five species: Rougheye rockfish (*Sebastes aleutianus*, Pacific ocean perch (*Sebastes alutus*), Shortraker rockfish (*Sebastes borealis*), Northern rockfish (Sebastes polyspinis), and Sharpchin rockfish (*Sebastes zacentrus*). "Other rockfish" will include all other rockfish species.

Table 2. 1998 data for shoreside hook-and-line Pacific cod directed fishery (from Blend 1998.dbf)

Species	Area 630 (catch in metric tons)	As percentage of P. cod	Area 650 (catch in metric tons)	As percentage of P. cod
Pacific cod	5,792		9	
Red rockfish	9	0.16	0.401	4.46
Other rockfish	61	1.05	2.079	23.1
Arrowtooth	85	1.47	0.135	1.50
Pollock	56	0.97	0.055	0.61
Flathead sole	22	0.38	0.011	0.12
Sablefish	9	0.16	0.006	0.07
Shallow-water flatfish	6	0.10	0.006	0.07
Deep-water flatfish	1	0.02	--------	
Other species[1]	626	10.81	1	11.11

[1]Sculpin, sharks, octopus, skates, and squid.

the experimental fishing is conducted, as is most likely, near Seward or Kodiak in area 630.[11] The bulk of catch in the "other rockfish" category listed in Tables 2 and 3 is yelloweye (*Sebastes ruberrimus*), a demersal shelf rockfish. Two slope rockfish species, redbanded (Sebastes babcocki) and silvergray (Sebastes brevispinis), as well as thornyheads (*Sebastolobus sp.*) also figure in the mix. Given that fishing activity will probably take place in area 630, AFDF has been limited in the preferred alternative to 0.5 mt of all rockfish species. It is noted that a number of other species are likely to be taken, including arrowtooth flounder and pollock, but in such small amounts that NMFS has not set catch limits for them in the preferred alternative for the EFP.

4.2 Incidental catch of halibut

The applicants have requested 4,000 to 12,000 lbs (1.82 - 5.45) mt of halibut, based on the assumption that 100 to 150 lbs of halibut will be caught per set. Since all halibut will be taken as part of the chartered vessel's IFQ, NMFS is not setting any special limit on halibut catch, nor allocating an amount of halibut for the EFP. It is noted however that using the same technique to derive likely halibut catch as was used above for various other species, the 1998 observer blend data indicate that if 9.5 mt of Pacific cod is caught, the likely halibut catch would be 0.25 mt, or 560 lbs, in area 630; or 0.13 mt, 277 lbs, in area 650, substantially less than the amount

[11]Pers. comm. Richard Drake, July 08, 1999.

Table 3. Estimated incidental catch of groundfish (mt) if experimental fishery harvests the maximum 9.45 mt authorized of Pacific cod, and if species mix conforms to blend data for 1998 shoreside longline fishery.

Species	Area 630	Area 650
Red rockfish	0.015	0.421
Other rockfish	0.099	2.183
Pollock	0.092	0.058
Arrowtooth flounder	0.139	0.142
Flathead sole	0.036	0.011
Sablefish	0.015	0.007
Shallow-water flatfish	0.009	0.007
Deepwater flatfish	0.002	0.000
Other species	1.022	1.050

anticipated by the applicant. The anticipated harvest of halibut by AFDF (above what would be expected as bycatch) is an acknowledgment that the revenue associated with IFQ halibut is a necessary consideration to vessel owners' participation in the experimental fishery.

4.3 Trophic interactions

The marine food-web of North Pacific marine fishes is complex (Livingston and Goiney 1983). Numerous species of plankton, phytoplankton, invertebrates, mollusks, crustaceans, forage fish, demersal, midwater, and pelagic fish, marine mammals, seabirds, and humans comprise the food-web present in the GOA. Environmental changes as well as human exploitation patterns can alter trophic interactions. Fishing causes direct changes in the structure of fish communities. It reduces the abundance of target and bycatch species, thereby changing predator prey ratios and affecting the interactions of non-target as well as target species. 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.)

Since this experimental fishing is designed to replicate commercial fishing conditions, it is to be expected that the effect of the experiment on the marine food web will also be replicated. However, since the amount of fish involved is small relative to the TACs for these species, these effects, although replicating those of the fishery as a whole, are expected to be very small.

4.4 Impacts on Essential Fish Habitat

The Magnuson-Stevens Act requires that Federal agencies consult with the Secretary of Commerce[12] with respect to any action "authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act" (Section 305(b)(2)). EFH is defined in the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH for species managed under the three FMPs pertaining to the Gulf of Alaska is described and identified in the EFH amendments approved January 20, 1999. These are Amendment 55 to the FMP for Groundfish of the Gulf of Alaska, Amendment 5 to the FMP for Scallop Fisheries off Alaska, and Amendment 5 to the FMP for the Salmon Fisheries in the EEZ off the Coast of Alaska. Under these descriptions, the potential sites for fishing under this EFP, which include waters off Seward, Kodiak and Sitka, contain EFH for Pacific cod, Pacific halibut, red king crab, and numerous other fish and invertebrate species at different life stages; in short, for most of the species managed under these FMPs.

Commercial fishing has many effects on EFH for commercial and non-commercial species. It removes large amounts of biomass, thus changing the size and sex structure of the target species as well as changing species composition and therefore predator-prey ratios. Changes in the ecosystem due to cyclical changes in oceanic temperature can have strong effects on the ecosystem which may need to be counterbalanced by a cautionary approach to the fishery (NPFMC 1998). Different types of fishing gear impact EFH in various ways. A discussion of the impacts of longline gear is contained below in section 4.4.1.

4.4.1 Fishing Gear Impacts

While researchers have focused their efforts recently on studying the effects of bottom trawl gear, little research has been done on the effects of longline gear on the benthic habitats of the North Pacific. NMFS scientists observed halibut longline gear during submersible dives off southeast Alaska in 1992 (NPFMC 1992). They observed that during the retrieval process, the line sweeps the bottom for considerable distances before lifting off the bottom, snagging whatever objects are in its path. Soft corals appeared unaffected, but hard corals were broken, smaller rocks were upended, and invertebrates were dislodged. Mortality of discards has not been studied extensively in Alaska. Some species, such as rockfish, may not survive the change in pressure if they are hauled up quickly from the bottom. Studies of Pacific halibut have shown that unless they are released carefully from hooks, mortality may be high. See Williams (1997) for information on halibut mortality rates. NMFS uses a mortality estimate of 12.5 percent in setting its annual prohibited species catch limits for halibut.

[12] As represented by NMFS.

4.4.2 Other impacts

One possible impact of artificial bait would be its effect on the environment when it is discarded into the ocean after use. AFDF (1997) points out that the artificial bait is biodegradable, composed of all natural ingredients, so that this discard should pose no more of a problem than the discard of natural bait.

4.4.3 Conclusion

Fishing under this EFP is not expected to have an adverse impact on EFH in the context of the commercial longline nearshore Pacific cod fishery. The experiment will occur over a maximum of 20 days, which includes both fishing trips; there will be only two to four sets per day, with four longlines in each set, and 200 hooks per longline. This is a small number in the context of the number of sets that occur in the commercial longline fishery, and the impacts associated with longline gear that will result from this experiment are correspondingly minimal. Furthermore, the amount of fish removed will be extremely small relative to the commercial fishery, at most constituting 0.014 percent of the TAC for this fishery (see section 4.1). The experiment itself will be carefully monitored, as the experimenters propose to record detailed information on each fish caught on each hook NMFS and the Council are grappling with the larger question of how to conduct the commercial fisheries in such a way as to minimize adverse impacts on EFH. However, fishing conducted under this EFP will not remove enough biomass to adversely affect EFH for any species.

4.5 Endangered Species Act considerations

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 program is administered jointly by NMFS–for most marine mammal species, marine and anadromous fish species, and marine plant species–and by the U.S. Fish and Wildlife Service for bird species, terrestrial and freshwater wildlife, and plant species.

Twenty-one species occurring in the GOA management area are currently listed as endangered or threatened under the ESA (Table 4). The group includes six great whale species, one pinniped, eleven Pacific salmon, and two seabirds.

Federal agencies have an affirmative mandate to conserve listed species (Rohlf 1989). One assurance of this is that Federal actions, activities or authorizations 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 the U.S. Fish and Wildlife Service). Formal consultations, resulting in biological opinions, are conducted for Federal actions that may have an adverse affect on the listed species.

Section 7 consultations have been done for all the above listed species, some individually and

some as groups. See the SEIS, section 3.8, for summaries of all previous section 7 consultations and Biological Opinions (NMFS 1998a). Fishing under the proposed EFP is not expected to have an impact on endangered, threatened, or candidate species.

The terms of the EFP require AFDF to take seabird avoidance measures. In the unlikely event that a short-tailed albatross is taken, it would be counted against the 4 short-tailed albatrosses allowed in the 1999-2000 period in the BSAI and GOA groundfish hook-and-line fisheries under the Biological Opinion issued by the U.S. Fish and Wildlife Service, March 19, 1999.

Table 4. Species currently listed as endangered or threatened under the ESA and occurring in the GOA groundfish management areas.

Common Name	Scientific Name	ESA Status
Northern Right Whale	*Balaena glacialis*	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
Snake River Sockeye Salmon	*Onchorynchus nerka*	Endangered
Short-tailed Albatross	*Diomedia albatrus*	Endangered
Steller Sea Lion	*Eumetopias jubatus*	Endangered and Threatened [2]
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
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
Steller's Eider	*Polysticta stelleri*	Threatened

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

4.6 Marine Mammal Protection Act considerations

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. Miscellaneous finfish/groundfish longline fisheries in Alaska are considered Category III fisheries (NMFS 1998a, p. 231) Incidental take of marine mammals in these fisheries, according to records dating back to 1990, has included Steller sea

lion, harbor seal, northern elephant seal, and Dall's porpoise (Hill et al 1997).

The EA prepared for the 1999 Groundfish Total Allowable Catch Specifications in the GOA (NMFS 1999) assessed the probable 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 add harvest amounts in excess of the 1999 TACs. However, estimated groundfish removals under the EFP would not be likely to measurably approach or exceed the overfishing levels already considered in the EA. The proposal from AFDF states furthermore that interactions with marine mammals are not expected, because of the mode and area of operations.

4.7 Coastal Zone Management Act considerations

Fishing under the proposed EFP 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.

4.8 Conclusions or Findings of No Significant Impact

For the reasons discussed above, granting of Exempted Fishing Permit #99-04 to test the effectiveness of artificial bait in the Pacific cod longline fishery in the GOA 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 SEIS (NMFS 1998) and the 1999 Groundfish Total Allowable Catch Specification EA (NMFS 1998b).

Assistant Administrator for Fisheries, NOAA

9/1/99
Date

5.0 References

AFDF. 1997. Development of functionally enhanced, fabricated longline baits from Alaskan seafood wastes. Project Narrative and Proposal to The Alaska Science Technology Foundation. Alaska Fisheries Development Foundation, 900 West 5th Ave., Suite 400, Anchorage, AK 99501.

AFDF. 1998. Field testing and further development of a new, functionally enhanced, longline bait fabricated from Alaskan seafood wastes: Phase 1 results and Proposal for continuation of ASTF Project No. 97-1-053. Alaska Fisheries Development Foundation, 900 West 5th Ave., Suite 400, Anchorage, AK 99501.

Hill, P. S., DeMaster, D. P., and Small, R. J. 1997. Alaska Marine Mammal Stock Assessments, 1996. In *NOAA Technical Memorandum NMFS-AFSC-78.* National Marine Fisheries Service, National Marine Mammal laboratory, 7600 Sand Point Way NE, Seattle, WA 98115. 154 p.

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.

Løkkeborg, S. 1990. Reduced catch of under-sized cod (Gadus morhua) in longlining by using artificial bait. *Canadian Journal of Fisheries and Aquatic Sciences* 47:1112-1115.

Løkkeborg, S. 1991. Fishing experiments with an alternative longline bait using surplus fish products. *Fisheries Research* 12:43-56.

Løkkeborg, S. and Å. Bjordal 1989. Responses of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*) to baited hooks in the natural environment. *Canadian Journal of Fisheries and Aquatic Sciences* 46:1478-1483.

Løkkeborg, S. and Å. Bjordal. 1992. Species and size selectivity in longline fishing: a review. *Fisheries Research* 13:311-322

Løkkeborg, S. and T. Pina 1997. 1997. Effects of setting time, setting direction and soak time on longline catch rates. *Fisheries Research* 32:213-222.

NMFS. 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 Amendment 5 to the Fishery Management Plan for the Salmon Fisheries in the EEZ off the Coast of Alaska (FONSI signed January 20, 1999.) Available from North Pacific Fishery Management Council, 605 W. 4th Avenue, Suite 306, Anchorage, AK 99501.

NMFS. 1998a. 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. (FONSI signed December 24, 1998.) Available from NMFS Alaska Regional Office, P.O. Box 21668, Juneau, AK 99801. 45 pg.

NOAA. 1997. NOAA Fisheries Strategic Plan, May 1997. Washington, D.C.: U.S. Dept. of Commerce.

NPFMC. 1992. Final Supplemental Environmental Impact Statement and Regulatory Impact Review/Initial Regulatory Flexibility analysis of Proposed Inshore/Offshore Allocation Alternatives (amendment 18/23) to the Fishery Management Plans for the Groundfish Fishery of the Bering Sea and Aleutian Islands and the Gulf of Alaska. North Pacific Fishery Management Council, 605 W. 4th Avenue, Suite 306, Anchorage, AK 99501.

NPFMC. 1998. "Stock Assessment and Fishery Evaluation Report of the Gulf of Alaska 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.

Rohlf, Daniel J. 1989. *The Endangered Species Act: a Guide to its Protections and Implementation.* Stanford, CA: Stanford Environmental Law Society. 207 pages.

Williams, G.H. 1997. Pacific halibut discard mortality rates in the 1990-1996 Alaskan groundfish fisheries, with recommendations for monitoring in 1998. In *Preliminary Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Bering Sea and Aleutian Islands Regions.* Bering Sea and Aleutian Islands Plan Team, Ed., North Pacific Fishery Management Council, 605 West 4th Avenue, Suite 306, Anchorage, AK 99501.

Woll, A.K., J. Boje, R. Holst and A.C. Gundersen. 1998. Catch rates and hook and bait selectivity in longline fishery for greenland halibut at east Greenland. International council for the Exploration of the Sea, ICES CM 1998/O:28.

6.0 List of Preparers

Nina Mollett
NMFS–Alaska Region

7.0 List of Agencies and Individuals Consulted

Richard Drake
Project Manager, AFDF

Andy Smoker
Biologist, NMFS Alaska Region

Nmollett 6/29/99, rev 7/8/99, rev 7/13/99, rev 7/15/99, 8/25/99
G:\FMGROUP\EFP\EFP.EA