MEMORANDUM

TO: Council, SSC and AP Members

FROM: Chris Oliver
Executive Director

ESTIMATED TIME
4 HOURS

DATE: March 28, 2003

SUBJECT: Steller Sea Lion Issues

ACTION REQUIRED

(a) Receive draft remand order response
(b) NRC report on Steller Sea lion/fishery interactions -schedule discussion for future action
(c) Receive report from NMFS on Aleutian Islands pollock trawl closure

BACKGROUND

(a) Remand Order

On October 19, 2001, NMFS issued a Biological Opinion that the groundfish fisheries in the BSAI and GOA, and parallel fisheries for pollock, Pacific cod, and Atka mackerel in State waters, if conducted under a suite of Reasonable and Prudent Alternatives (RPAs), would not jeopardize Steller sea lions and would not adversely modify their critical habitat. This 2001 BiOp was challenged in District Court (*Greenpeace, American Oceans Campaign, and Sierra Club vs. NMFS*, et al., No. C98-492Z). Judge Thomas Zilly responded to this challenge with a court order on December 18, 2002, stating that aspects of the 2001 BiOp were arbitrary and capricious, and remanded his order to NMFS for further action (Item C-3(a)(1)). The order is effective until June 30, 2003 (thus the BiOp and the RPAs remain effective until that date).

The Remand Order presents two areas where the Court determined that NMFS was arbitrary and capricious in its conclusions. One was the BiOp's conclusions that Steller sea lions were not in jeopardy based on the zonal approach to fishery management in Steller sea lion critical habitat. Judge Zilly pointed out discrepancies in the sea lion telemetry data that allowed one to reach other conclusions. Second, Judge Zilly found that NMFS failed to analyze the likely effects of the RPAs on Steller sea lions, their prey, and their critical habitat.

NMFS prepared a plan to respond to Judge Zilly's Remand Order (See memorandum from James W. Balsiger to William T. Hogarth dated January 16, 2003, Item C-3 (a)(2)). NMFS' plan is to prepare a supplemental document that is an addendum to the 2001 BiOp which provides additional analyses that respond to Judge Zilly's two issues:

- The factual basis in the telemetry data, including new data, for the relative weighting of importance of critical habitat zones around SSL rookeries and haulouts, and

- A comparison of the 1999 "jeopardy" fishery pattern analyzed in the FMP BiOp and the fishery pattern under the revised RPAs in the 2001 BiOp.

At this meeting, the Council will receive a draft 2001 BiOp Addendum prepared by NMFS that responds to the Remand Order. NMFS will provide an overview of the document and the conclusions reached.

NMFS will accept comments on this draft document until mid April. NMFS plans to file the final BiOp Addendum with the Court in early June 2003.

(b) National Research Council Report on the Decline of Steller Sea Lions in Alaskan Waters

In November 2000, Congress directed the Council to sponsor an independent scientific review by the National Academy of Sciences of the causes of the Steller sea lion decline and the potential efficacy of the new management regimes imposed on GOA and BSAI groundfish fisheries to avoid jeopardizing the sea lions and causing adverse modification of their habitat. NAS directed their National Research Council to empanel a group of experts to prepare a report on this issue. The NRC's Committee on the Alaska Groundfish Fishery and Steller Sea Lions completed their report in early 2003. This report, entitled "Decline of the Steller Sea Lion in Alaskan Waters - Untangling Food Webs and Fishing Nets", presents the Committee's findings on:

(1) The current status of knowledge about the decline in the Steller sea lion population in the BSAI and GOA,

(2) The relative importance of food competition and other possible causes of population decline and impediments to recovery,

(3) Critical information gaps in understanding the interactions between Steller sea lions and Alaska fisheries,

(4) The kind of research programs needed to identify and assess human and natural causes of sea lion decline, and

(5) The components of an effective monitoring program with effective measures for evaluating various management approaches.

The Executive Summary of the report is attached as Item C-3(b)(1). The report was previously provided to the Council and its SSC and AP.

At this meeting, the Council may discuss the NRC findings and potential actions by the Council in response to the report.

(c) Report on Aleutian Islands pollock fishery closure

At its October 2002 meeting, the Council made a final review of the analysis of two trailing amendments to the Supplemental Programmatic EIS, one on the Aleutian Islands pollock fishery allowance and the other on the Board of Fisheries exemptions. These trailing amendments were to provide additional measures for Steller sea lion protection for implementation during the 2003 season. The proposed amendments were comprised of five alternatives. The Council approved Alternative 2, maintaining the closure of the Aleutian Islands pollock fishery for one year. But the Council also requested additional information on this issue, and approved a Work Plan for a comprehensive review of the effects of reopening the Aleutian Islands pollock trawl fishery, including:

- The current Steller sea lion stock structure within the Aleutian Islands,

- A consideration of the current theory and information regarding localized fishery depletions and sea lion densities,
- The importance of such prey densities and forage availability to weaned pups and nursing females,
- The most current telemetry information on weaned pups and foraging outside of critical habitat in the Aleutian Islands,
- The cumulative effects on these sea lion age classes resulting from multiple fisheries on sea lion prey in the Aleutian Islands (Atka mackerel, Pacific cod, pollock), and
- An analysis of cumulative impacts arising from reopening the Aleutian Islands pollock fishery on bycatch of target and non-target species, forage fish or other prey of Steller sea lions and potential impacts on other fisheries.

NMFS will provide an update to the Council on this issue. Their letter is attached as Item C-3(c)(1)

AGENDA C-3(a)(1)
APRIL 2003

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

GREENPEACE, AMERICAN OCEANS CAMPAIGN, and SIERRA CLUB,

Plaintiffs,

v.

NATIONAL MARINE FISHERIES SERVICE, and DONALD L. EVANS, in his official capacity as Secretary of the Department of Commerce,

Defendants,

AT-SEA PROCESSORS ASSOCIATION, UNITED CATCHER BOATS, ALEUTIANS EAST BOROUGH, and WESTWARD SEAFOODS, INC., et al.,

Defendant-Intervenors.

NO. C98-492Z

ORDER

I. INTRODUCTION

Plaintiffs Greenpeace, American Oceans Campaign, and the Sierra Club originally filed suit in 1998 challenging the National Marine Fisheries Service's (NMFS) North Pacific Fishery Management Plans for the groundfish fisheries in the Bering Sea and Gulf of Alaska. Plaintiffs claim these fisheries are harmful to the endangered Steller sea lion and seek relief under the Endangered Species Act, the National Environmental Policy Act, and the

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Administrative Procedure Act. This litigation has resulted in several prior motions and court rulings on various issues. For a detailed description of the relevant legal and factual background in this case, see Greenpeace v. National Marine Fisheries Service, 55 F. Supp. 2d 1248 (W.D. Wash. 1999) (hereinafter Greenpeace (I)); Greenpeace v. National Marine Fisheries Service, 80 F. Supp. 2d 1137 (W.D. Wash. 2000) (hereinafter Greenpeace (II)); and Greenpeace v. National Marine Fisheries Service, 106 F. Supp. 2d 1066 (W.D. Wash. 2000) (hereinafter Greenpeace (III)). This litigation has a long history which is outlined later in this Order. The matters presented at this time represent the latest disputes relating to the Steller sea lions.

This matter now comes before the Court on cross-motions for summary judgment related to Plaintiffs' Eighth, Ninth, and Tenth claims stated in Plaintiffs' Supplemental Complaint, docket no. 526. Plaintiffs' Eighth claim challenges the no jeopardy conclusion of the October 19, 2001 biological opinion (2001 BiOp) issued by NMFS. Plaintiffs' Ninth claim challenges the no adverse modification conclusion of the 2001 BiOp. Plaintiffs' Tenth claim challenges the no jeopardy or adverse modification conclusion as to global fishing rates in the November 30, 2000 biological opinion issued by NMFS (FMP BiOp) and the 2001 BiOp. Plaintiffs move for summary judgment on their Eighth, Ninth, and Tenth claims. See docket no. 544. Federal Defendants, the National Marine Fisheries Service and Donald L. Evans, Secretary of Commerce, cross-move for summary judgment on these claims. See docket no. 551. Defendant-Intervenors Aleutians East Borough, At-sea Processors Association, Fishing Company of Alaska, Inc., Groundfish Forum, Westward Seafoods, Inc , *et al.*, and United Catcher Boats also cross-move for summary judgment on the same claims. See docket no. 553.

The Court has reviewed the documents filed in support of and in opposition to the motions together with the relevant administrative record. On October 30, 2002, the Court heard oral argument from the parties on the issues presented by the pending motions. After oral argument, the Court took the matter under advisement. Being fully advised, the Court now GRANTS Plaintiffs' Motion for Summary Judgment as to Claims Eight and Nine and DENIES Plaintiffs' Motion for Summary Judgment as to Claim Ten. For the same reasons, the Court DENIES Defendants' and Defendant-Intervenors' Motions for Summary Judgment as to Claims Eight and Nine and GRANTS Defendants' and Defendant-Intervenors' Motion for Summary Judgment as to Claim Ten. The Court remands the 2001 BiOp to the National Marine Fisheries Service for further action in compliance with this Order.

II. BACKGROUND

The Gulf of Alaska (GOA) and the Bering Sea/Aleutian Islands region (BSAI), collectively referred to as the North Pacific ecosystem, is home to the largest commercial fishery in the United States. The ecosystem is also home to the western population of Steller sea lions. In 1990, the western population of Steller sea lions was listed under the Endangered Species Act (ESA) as a threatened species and in 1997 was reclassified as endangered. This case arises out of the attempt to regulate this fishery in light of the presence of an endangered species and the legal dictates of the ESA and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson Act), 16 U.S.C. § 1801 *et seq*. Regulation of this fishery under these dictates has been far from a simple task, as the extensive litigation history of this case, extending back to the filing of the original complaint on April 15, 1998, and the voluminous administrative record, comprising more than 50,000 pages of documents, amply demonstrate. It is clear to the Court that a tremendous amount of time, energy, and resources have been expended in attempting to end the decline of the western population of Steller sea lions, while maintaining the fishing industry that is so important to the region, on the basis of ever-changing scientific knowledge.

A. A Brief Review of the Procedural Process

Under the Magnuson Act, the North Pacific Fishery Management Council (Council) prepares Fishery Management Plans (FMPs) that regulate all aspects of the commercial fisheries in the North Pacific ecosystem. <u>See</u> 16 U.S.C. §§ 1852(a)(1)(G), (h). The promulgation of FMPs constitutes "agency action" under the ESA.

The ESA imposes upon the National Marine Fisheries Service the duty to "insure" that any proposed action by the Council does not "jeopardize" the continued existence of any threatened or endangered species or result in the destruction or "adverse modification" of the critical habitat of such species.[1] See 16 U.S.C. § 1536(a)(2). A species is "endangered" when it is in danger of extinction throughout all or a significant portion of its range. See 16 U.S.C. § 1532(6). The designated critical habitat of a species is intended to protect those geographical areas occupied by the species which contain the physical and biological features essential for the survival and recovery of the species. See 16 U.S.C. §§ 1532(3), 1532(5)(A)(i); see also 58 Fed. Reg. 45,269 (August 27, 1993) (final rule designating Steller sea lion critical habitat).

In order to avoid jeopardy and adverse modification, the ESA requires that the "action" agency consult with an "expert" agency to evaluate the effects a proposed agency action may have on a listed species.[2] If the action agency determines that a proposed agency action may adversely affect a listed species, the action agency is required to perform a formal consultation with the expert agency. 50 C.F.R. § 402.14(a). The final product of a formal consultation is a biological opinion (BiOp) which states the expert agency's conclusions regarding the possibility of any jeopardy or adverse modification that the proposed action would cause. See 16 U.S.C. § 1536(a)(2). When jeopardy or adverse modification is found, the expert agency must propose "reasonable and prudent alternatives" (RPAs), by which the action can proceed without causing jeopardy or adverse modification. See 16 U.S.C. § 1536(b)(3)(A).

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[1] "Jeopardize" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02. "Adverse modification" means "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species." Id.

[2] In this case, NMFS's Office of Sustainable Fisheries is the "Action" Agency and NMFS's Office of Protected Resources is the "Expert" Agency.

B. A Brief Review of the Agency Actions and Litigation History

In April 1998, Plaintiffs filed suit in this Court initially alleging that NMFS was implementing a North Pacific fishery management plan without a comprehensive Environmental Impact Statement or adequate biological opinions addressing the effect of the fisheries on the Steller sea lion. See Complaint, docket no. 1. Plaintiffs specifically challenged biological opinions issued by NMFS in January 1996 for the BSAI and in March 1998 for the GOA. On October 9, 1998, this Court stayed the pending litigation because NMFS represented to the Court that it was in the process of preparing a Supplemental Environmental Impact Statement and a new biological opinion that would address all federally managed fisheries in the BSAI and GOA. In December of 1998, NMFS issued two biological opinions addressing the potential effects of the North Pacific groundfish fisheries on the Steller sea lion. The first opinion (BiOp1) discussed the effects of the pollock and Atka mackerel fisheries on the Steller sea lion. The second opinion (BiOp2) considered the effects of the FMP in their entirety. Plaintiffs challenged both of these opinions.

In BiOp1, NMFS concluded that the mackerel fishery was not likely to jeopardize the Steller sea lion population but that the pollock fishery was likely to result in jeopardy. The Court upheld these findings under the ESA. See Greenpeace (I), 55 F. Supp. 2d 1248, 1269 (W.D. Wash. 1999). However, the Court ruled that the RPA adopted by the Council and approved by NMFS with respect to the pollock fishery was arbitrary and capricious and remanded to NMFS for preparation of a revised RPA. Id. at 1276. In October, 1999, NMFS issued Revised Final Reasonable and Prudent Alternatives for the pollock fishery.

In BiOp2, NMFS analyzed the effects of its entire fishery management scheme on the Steller sea lion. The Court ruled on January 25, 2000 that BiOp2 was inadequate under the ESA because it was not a comprehensive opinion and failed to analyze the full scope of the FMP. Greenpeace (II), 80 F. Supp. 2d 1137, 1150 (W.D. Wash. 2000). Thereafter, on July 19, 2000, this Court enjoined all groundfish trawl fishing within Steller sea lion critical habitat in the oceans of the BSAI and GOA west of 144° W longitude.[3] The Court concluded that NMFS was in continuing violation of the ESA and plaintiffs had proven both "irreparable harm" and that continued fishing posed "a reasonably certain threat of imminent harm" to the Steller sea lion. Greenpeace (III), 106 F. Supp. 2d 1066, 1080 (W.D. Wash. 2000).

On November 30, 2000, NMFS issued a new biological opinion on the North Pacific groundfish fisheries (FMP BiOp) and the Court dissolved the injunction. See Order, docket no. 486. The FMP BiOp also concluded that the FMP in existence was likely to jeopardize endangered Steller sea lions and adversely modify their designated critical habitat. See S6-249 at 268, 270. Accordingly, NMFS included an RPA to the FMP in the FMP BiOp. Id. at 271-300. The RPA contained within the FMP BiOp imposed a series of heightened regulations on the North Pacific fisheries including the complete closure of two-thirds of Steller sea lion critical habitat to all fishing for pollock, Pacific cod, and Atka mackerel, seasonal catch limits within the remainder of critical habitat to spatially distribute the fishing, and a system of four seasons inside critical habitat and two seasons outside critical habitat to temporally redistribute the fishing. Id. at 271-72.

After the issuance of the FMP BiOp, a rider was placed on an appropriations bill limiting the implementation of the RPA. See Consolidated Appropriations Act, 2001, Pub. L. No. 106-554, § 1(a)(4), [Div. A, § 209], 114 Stat. 2763, 2763A-176 (2000). The legislation required NMFS and the Council to consult and review the measures necessary to protect the Steller sea lion and its critical habitat. As a result of this legislation the Council proposed a number of changes to the RPA in the FMP BiOp to be implemented through the Magnuson Act procedures (Amended RPA). The Amended RPA reopened areas of critical habitat to fishing previously closed by the RPA, eliminated the four season dispersal of

[3] Critical habitat for Steller sea lions consists of all major rookeries and haulouts in Alaska west of 144° W longitude, including the associated waters within 20 nautical miles (nm) of these sites, and three special aquatic foraging areas. S6-249 at 60-61.

fishing within critical habitat except for pollock, and removed many of the spatial distribution measures implemented in the RPA. S8-549, Table 3.1 at 39-42, Table 5.4 at 153.

Because of the passage of legislation, and its effect on implementation of the RPA in the FMP BiOp, the parties agreed to temporarily stay litigation. On March 6, 2001, the Court entered a Stipulation and Order staying this litigation until June 15, 2001. NMFS subsequently announced that it intended to reinitiate consultation on the FMPs and release a new biological opinion on October 19, 2001. The Court therefore entered a Stipulation and Order continuing the stay until November 1, 2001.

NMFS reviewed the Amended RPA and issued a new biological opinion on October 19, 2001 (2001 BiOp). The 2001 BiOp was limited to a review of the Amended RPA and did not reconsider the original jeopardy and adverse modification conclusion of the FMP BiOp. The 2001 BiOp found that the Amended RPA was not likely to jeopardize the continued existence of the western population of Steller sea lions or adversely modify their critical habitat. See id. at 185. The 2001 BiOp states in part that the FMP BiOp "will remain in effect as NMFS' coverage at the plan level, and this opinion will address the project level effects on listed species that would be likely to occur if the Council's preferred action were implemented." Id. at 8. Thus, the 2001 BiOp supplements, but does not replace the FMP BiOp. Therefore, the Court must review both biological opinions to resolve the pending motions.

III. ANALYSIS

A. Standard of Review

Challenges to biological opinions issued pursuant to Section 7 of the ESA, 16 U.S.C. § 1536, are reviewed under the Administrative Procedures Act (APA) to determine whether the biological opinion was "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A). A biological opinion is arbitrary and capricious if it fails to articulate a satisfactory explanation for its conclusions, relies on factors which Congress did not intend for it to consider, or fails to consider an important aspect of the problem. See Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983). Courts will defer to an agency's technical or scientific expertise. See Central Ariz. Water Conservation Dist. v. United States EPA, 990 F.2d 1531, 1540 (9th Cir. 1993); United States v. Alpine Land & Reservoir Co., 887 F.2d 207, 213 (9th Cir. 1989). However, this deference is not unlimited, and the presumption of expertise may be rebutted if the agency's decisions are based on science but are shown to be not reasonable. Defenders of Wildlife v. Babbitt, 958 F. Supp. 670, 679 (D.D.C. 1997); N. Spotted Owl v. Hodel, 716 F. Supp. 479, 482 (W.D. Wash. 1988).

B. Claim Ten of the Supplemental Complaint

Claim Ten of the Supplemental Complaint alleges that the FMP BiOp and the 2001 BiOp are arbitrary and capricious because they determined that jeopardy and adverse modification would not result until key Steller sea lion prey populations were reduced below the target population level established in current FMPs. Plaintiffs make two arguments in their motion for summary judgment as it relates to Claim Ten of the Supplemental Complaint. Plaintiffs argue that the FMP BiOp's conclusion that the overall harvest rates set forth in the FMP will not cause jeopardy or adverse modification to the Steller sea lion critical habitat is arbitrary and capricious. Second, Plaintiffs contend that the global control rule as set forth in the RPA is arbitrary and capricious because it will not prevent jeopardy or adverse modification. Defendants contend that Plaintiffs' claims are without merit and that Claim Ten of the Supplemental Complaint should be dismissed.

1. Overall Harvest Rates

Plaintiffs' first challenge is to the conclusion of the FMP BiOp, which is incorporated in the 2001 BiOp, that the overall level of fishing allowed under the status quo fishery management plan does not jeopardize the continued existence of Steller sea lions or adversely modify their critical habitat. The FMP BiOp concluded that there was "no significant, relevant evidence that the current exploitation strategy (which reduces the biomass to between 40 and 60% of the predicted unfished biomass)[4] adversely affects listed species by reducing their likelihood for survival and recovery in the wild." S6-249 at 250. Plaintiffs contend that this conclusion is arbitrary and capricious because it is not supported by data within the FMP BiOp and runs contrary to the FMP BiOp's concomitant finding that "biomass reductions of Steller sea lion prey species, along with other factors such as climate change, natural predators, etc., were a significant contributing factor of the reduction and current decline of the population of Steller sea lions." Id. at 259. Nonetheless, the FMP BiOp goes on to state that "the current strategy maintains biomass at acceptable levels." Id. These two statements appear at first glance to be contradictory, but are not necessarily irreconcilable.

Although the Court "may not supply a reasoned basis for the agency's action that the agency itself has not given," Bowman Transp., Inc. v. Arkansas-Best Freight System, Inc., 419 U.S. 281, 285-86 (1974) (citing SEC v. Chenery Corp., 332 U.S. 194, 196 (1947)), the Court should "uphold a decision of less than ideal clarity if the agency's path may reasonably be discerned." Bowman, 419 U.S. at 286. Plaintiffs contend that the FMP BiOp's analysis of total catch rates is "limited to a single paragraph." Plaintiffs' Motion for Summary Judgment, docket no. 544, at 15. This argument fails to view the FMP BiOp as a complete document and fails to take into consideration the other conclusions of the FMP BiOp. The FMP BiOp extensively reviewed the population trends of the Steller sea lion and the overall fishing rates, and concluded that the manner in which the current fishing strategy contributed to the decline of the species was not by reducing *overall* biomass, but by causing *localized depletions*, temporally and spatially within the Steller sea lion's critical habitat, which nutritionally stresses Steller sea lions.

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[4] The 40-60% reduction in spawning biomass (*spawning* biomass excludes juvenile fish because they do not aid in the reproductive success of the population) from unfished levels is an extrapolation of what the fish population would look like if there were no commercial fishery, compared to the current population.

The conclusion that the harm to the Steller sea lion derives from concentrated localized fishing in critical habitat areas and not from global depletion of prey species has been the assumption and conclusion of NMFS beginning with the Steller sea lion critical habitat designation in 1993. See AR 5 at 3, 58 Fed. Reg. 45,269, 45,271 (Aug. 27, 1993) ("At present, NMFS believes that the exploitation rates in federally managed fisheries are unlikely to diminish the overall abundance of fish stocks important to Steller sea lions. However, spatial and temporal regulation of fishery removals in some areas has been determined to be necessary to ensure that local depletion of prey stocks does not occur."); AR 114 at 236, Report by National Research Council (stating that it is unlikely that the total rate of depletion of pollock has been responsible for a decrease in mammals and that "[i]t is more likely that marine mammals and birds have been affected by the distribution in space and time of fishing effort on pollock . . . ."). These assumptions were reviewed and challenged as part of the process of developing the FMP BiOp. See, e.g., S6-99 at 2 (discussing the assumptions made regarding overall harvest in the 1998 BiOp and concluding that the assumption that total allowable catch is irrelevant "dramatically underestimated the potential adverse effects of the fisheries on the marine ecosystem of the North Pacific"); S6-123 (asking, "On what basis does sustainable fisheries insure that such a reduction in prey does not have serious effects on listed species, critical habitat, or the ecosystems?").

In light of the questions raised regarding this baseline presumption that the 40-60% reduction in spawning biomass was not detrimental to the Steller sea lions, an Analytical Team was formed to analyze this and other presumptions of the FMP BiOp. See S6-126. The Analytical Team concluded that as "the current groundfish prey stock size is at 58% of the unfished level while the abundance of [Steller sea lion] is about 22% of their assumed original carrying capacity . . . it is unlikely that the current overall abundance levels of groundfish are restricting [Steller sea lion] carrying capacity." S6-160 at 6. Additionally, the Analytical Team considered ecosystem wide effects of prey removal and concluded that current science indicates that "under the status quo regime, there has not been clear evidence of fishing as the cause of species fluctuations through food web effects" and "no evidence that groundfish fisheries caused declines" in diversity. Id. at 32, 36. The conclusions of the Analytical Team support the FMP BiOp's assumption that overall harvest rates are not the cause of Steller sea lion population decline.[5]

The FMP BiOp also includes a Steller sea lion case study estimating prey availability for Steller sea lions based on the 1999 prey biomass estimates. S6-249, App. 3. The case study supports the conclusion that the current overall harvest rates do not adversely affect the Steller sea lions. It concluded, in part, that estimates of food requirements for the sea lion population "are below available biomass even at current fishing mortality . . . ." S6-249 at 226. This conclusion was reached by estimating the monthly amount of prey availability in the North Pacific Ecosystem and comparing it to monthly estimates of sea lion prey consumption. See S6-249, App. 3 at 1-2. The comparison demonstrated that "the available data on monthly consumption requirements relative to the total biomass of three important prey species in critical habitat are consistent with the conclusion that forage availability (without consideration regarding species composition or spatial distribution) is adequate to support the recovery of Stellar sea lions to optimal population levels." Id. at 2. The case study's ultimate conclusion was that:

> Based on the available information, it is reasonable to expect the groundfish fisheries do compete with non-human consumers in the marine ecosystem in the BSAI and GOA. However, this competition occurs as a result of the temporal and spatial behavior of the fishing fleet, and removals by this fleet on a local level, not as a result of a decrease in total prey availability due to the reduction of total fish biomass.

Id. at 4. The 2001 BiOp continues this discussion and states that a review of the current estimates of Steller sea lion population and prey availability "could lead one to conclude that

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[5] Plaintiffs challenge NMFS's reliance on the conclusions of the Analytical Team because they are the views of the Action Agency rather than the Expert Agency. A conclusion by the Expert Agency that the Action Agency has properly analyzed the data is not, however, foreclosed under the review process required by the ESA.

there is sufficient forage in the Gulf of Alaska, Bering Sea, and Aleutian Islands, combined, to support a healthy stock of Steller sea lions." S8-549 at 166.[6]

Plaintiffs direct the Court to remarks by other contributors and reviewers challenging this assumption and conclusion of the FMP BiOp. One reviewing scientist criticizes the finding by arguing that it does not account for the fact that a reduction of overall prey will force predators to expend greater resources catching prey even where there is sufficient prey to be caught. S8A1-851 at 1-2. Although this criticism may be valid, it does not make NMFS's decision to rely on the opposite conclusion arbitrary and capricious. Marsh v. Or. Natural Res. Council, 490 U.S. 360, 378 (1989) ("When specialists express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own qualified experts even if, as an original matter, a court might find contrary views more persuasive.").

Accordingly, the Court concludes that the FMP BiOp's determination that the Overall Harvest Rates do not cause jeopardy or adverse modification is not arbitrary and capricious.

2. Global Control Rule

Plaintiffs contend that even if NMFS's no jeopardy or adverse modification conclusion regarding the overall harvest rates is not arbitrary and capricious, the global control rule set out in the Amended RPA is arbitrary and capricious. The global control rule is a protective measure that alters the allowable biological catch ("ABC") of pollock, Pacific cod, and Atka mackerel on a sliding scale basis as projected prey stocks drop. The goal of the global control rule is to prevent a decline in total biomass to a level that would jeopardize Steller sea lions. The dispute between Plaintiffs and Defendants is whether the global control rule set out in the Amended RPA is sufficiently stringent to keep prey stocks from dropping to an overall level that would cause jeopardy or adverse modification.

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[6] This conclusion is based on the assumption that a Steller sea lion needs between 22 times to 46 times more forage than it is capable of consuming in a single year. These figures are known as the "forage ratio." S8-549 at 164.

The global control rule in effect at the time of the FMP BiOp began reducing fishing when prey stocks fell below 40% of unfished levels, and prohibited fishing when prey stocks fell to a projected theoretical level of 2% of unfished levels. S6-249 at 212, 259; S6-160 at 26-28. In the Amended RPA, NMFS set out a revised global control rule which starts limiting the amount of fishing when estimated prey stocks are less than 40% of unfished biomass, and bans all fishing when stocks drop to 20% of unfished levels.[7] S8-549 at 24-25. Plaintiffs argue that this rule is inadequate because the FMP BiOp and the 2001 BiOp conclude that fishing which reduces prey biomass to below 40% of unfished levels will not insure protection of the Steller sea lion. Defendants assert that the biological opinions never concluded that a drop below 40% would cause jeopardy or adverse modification. Defendants argue that the global control rule in the Amended RPA is consistent with the conclusion that jeopardy or adverse modification would occur only if fishing stocks drop to an unknown level that is below 20% of unfished levels.

The FMP BiOp states that "biomass reductions of important groundfish species below 40% of their unfished level would not insure the protection of listed species or their environment." S6-249 at 250-51. The FMP BiOp also states that although current fishing strategies had maintained biomass at acceptable levels, "the current harvest control rule in use by NMFS allows for significant variation below the target biomass level. . . . [T]he fishery could be conducted to the point that only 2% of the unfished biomass remained." Id. at 259. Accordingly, in the FMP BiOp RPA, the FMP BiOp concluded that the global control rule had to be revised to prevent "directed fishing for a species when the spawning

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[7] The Amended RPA slightly changed the global control rule NMFS proposed in the FMP BiOp RPA. The global control rule in the RPA started limiting fishing at a linear rate when stocks reached 40% of unfished levels and banned fishing when stocks reached 20% of unfished levels. S6-249 at 273. Under the Amended RPA, the global control rule limits fishing when prey stocks are between 40% of unfished levels and 20% of unfished levels at a slightly slower rate, and bans fishing when prey stocks reach 20% of unfished levels. S8-549 at 24-25. The changes between the RPA and the Amended RPA do not significantly affect Plaintiffs' challenges to the global control rule. Thus, the Court need not consider the justification for the rule separately under the FMP BiOp and the 2001 BiOp.

biomass is estimated to be less than 20% of the projected unfished biomass." Id. at 271. The FMP BiOp RPA concluded that because "fishing for pollock, Pacific cod and Atka mackerel under this control rule would cease at a population size 10 times larger than under current practices," it should "ensure that adequate levels of each prey species are maintained for Steller sea lions." Id. at 273.

Plaintiffs contend it was arbitrary and capricious for NMFS not to ban all fishing when projected spawning biomass falls below 40% of unfished levels. Plaintiffs' argument hinges on the statement in the FMP BiOp that "biomass reductions of important groundfish species below 40% of their unfished level would not insure the protection of listed species or their environment."[8] Id. at 250-51. Plaintiffs, however, take this statement out of context. The previous sentence states that the current fishing strategy (referring to the 1999 plan), which sought to maintain prey stocks at an average of 40% of unfished levels, did not adversely affect Steller sea lions. Id. at 250. The statement on which Plaintiffs rely was summary language placed at the start of a lengthy discussion regarding the current harvest strategy. The FMP BiOp concluded that the current harvest strategy maintained target biomass at an acceptable level. Id. at 259. Thus, the statement does not say that any reduction of biomass below 40% would cause jeopardy or adverse modification, but that a fishing strategy that attempted to have a target fishing level below 40% would not be sufficiently protective. Plaintiffs' attempt to conflate the FMP BiOp's conclusion regarding the lowest target fishing level needed to insure protection with a conclusion that all fishing must be banned when stocks drop below 40% of unfished levels is faulty. The goal of the global control rule is to have the "forage base of a particular prey item [be] on average above 40% of unfished biomass," S6-864 at 2, and thus the conclusion that a modified amount of fishing can continue after stocks fall below 40% of unfished levels is not arbitrary and

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[8] Other than this sentence, Plaintiffs do not direct the Court to any discussion within the administrative record regarding a threshold global level of prey necessary for the protection of the Steller sea lions.

capricious. Although NMFS stated that "take"[9] of Steller sea lions could be expected to occur below a biomass level of 40%, S6-249 at 259, "take" is not the same as a jeopardy or adverse modification conclusion, which requires a separate inquiry. See id. at 258-59. Moreover, scientists discussing the global control rule worked from the assumption that the 40% line was not a jeopardy or adverse modification line. S6-854; S6-855.

Plaintiffs argue that the ban on fishing when prey stocks reach 20% of unfished levels is arbitrary and capricious because NMFS failed to explain why it drew the line at 20%. Defendants argue that the 20% line is adequate to insure against jeopardy and adverse modification. Defendants argue that 20% was chosen because it was so high that jeopardy or adverse modification could not possibly result. Transcript, docket no. 571, at 69.

The administrative record provides some support for Defendant's argument. The FMP BiOp states in the RPA that a global control rule that requires fishing to stop at a population size 10 times larger than under current practices "should ensure that adequate levels of each prey species are maintained for Steller sea lions." S6-249 at 273. One member of the RPA team stated in an email that "the [Steller sea lion] population will be in jeopardy of continued existence from a perspective of the 'F40' strategy alone should the forage level drop to where it would no longer support a population as large as 20,000 animals (i.e., a 0.2 ratio of fish biomass current to unfished biomass)." See S6-864 at 2 (Email from Dr. DeMaster). Although the administrative record does not clearly state when jeopardy or adverse modification would occur, Plaintiffs acknowledged at oral argument that the ESA does not require NMFS to actually declare such a line. Transcript, docket no. 571, at 92. Therefore, given that the global control rule at the time of the FMP BiOp did not prohibit fishing until prey stocks reached 2% of unfished levels while the Amended RPA bans fishing at a figure ten times the previous amount, and given that no jeopardy or adverse modification

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[9] The ESA defines "take" as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" and does not require that actual death occur or that the species population declines. 16 U.S.C. § 1532(19).

could be expected to occur until prey stocks fell below 20% of unfished levels, the Court finds that the 20% line chosen by NMFS is not arbitrary and capricious. The Court finds that the 20% line is sufficiently high to insure that no jeopardy or adverse modification will occur. The Court notes that currently no prey stocks are even near 20% of their unfished levels.

Because the Court has determined that the FMP BiOp's conclusion that the overall harvest rates will not cause jeopardy or adverse modification to the Steller sea lion critical habitat was not arbitrary and capricious, the Court does not find that the global control rule violates the ESA. This strategy is a prudent and reasonable action in light of the uncertainties surrounding the impacts of overall decreased prey availability.[10]

For the foregoing reasons, the Court DENIES Plaintiffs' Motion for Summary Judgment and GRANTS Defendants' and Defendant-Intervenors' Cross-Motions for Summary Judgment as to Claim Ten of the Supplemental Complaint, docket no. 526.

C. Claims Eight and Nine – 2001 BiOp Conclusions Regarding Jeopardy and Adverse Modification

The ESA requires NMFS to "insure that any action . . . is not likely to jeopardize the continued existence of any endangered species . . . or result in the destruction or adverse modification of habitat or such species." 16 U.S.C. § 1536(a)(1). Plaintiffs argue that NMFS acted arbitrarily and capriciously in concluding in the 2001 BiOp that the 2001 proposed amendments to the FMP BiOp RPA are not likely to adversely modify the designated critical habitat of the western population of Steller sea lions or jeopardize the continued existence of the Steller sea lions. First, Plaintiffs contend that the "zonal approach" applied in the 2001 BiOp is arbitrary and capricious because it relies upon

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[10] See, e.g., Review of the November 2000 Biological Opinion and Incidental Take Statement with respect to the Western Stock of the Steller sea lion, S8-176 at 48-49 (concluding that review of the effect of global fisheries on the Steller sea lion population results in a determination that "there is no justification for altering the current control rule for pollock, cod, and Atka mackerel.").

conclusions that scientific data does not support. Plaintiffs further argue that insofar as the no jeopardy and no adverse modification findings relied on the DeMaster Study, S8-650, they are arbitrary and capricious. Second, Plaintiffs argue that the 2001 BiOp failed to assess or analyze the likely effects on Steller sea lions and their prey that the level of fishing allowed under the Amended RPA in critical habitat causes. Each of these arguments relates equally to claims Eight (relating to the no jeopardy conclusion of the 2001 BiOp) and Nine (relating to the no adverse modification conclusion of the 2001 BiOp) of the Supplemental Complaint.[11]

1. Zonal Approach

The driving force behind the Amended RPA was a determination that different areas of critical habitat are of varying levels of importance to Steller sea lions, based on how much Steller sea lions use each area. See S8-549 at 18 ("This opinion focuses on the modifications to the FMP because they were developed to be in lieu of the previous RPA. . . . [G]iven the new biological information of Steller sea lions, [the conclusion was reached] that there were other possible ways to avoid jeopardy and adverse modification for sea lions and their habitat."). The Amended RPA was developed and reviewed under a "zonal approach" to management. This zonal approach was developed in large part on the basis of telemetry data.[12] Id. at 139 ("The results from current telemetry analyses . . . provide a basis to begin evaluating sea lion foraging ecology at a level of detail not previously possible.").

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[11] While the concepts of jeopardy and adverse modification overlap considerably, they are two separate standards and are to be analyzed separately. Conservation Council for Haw. v. Babbitt, 2 F. Supp. 2d 1280, 1287 (D. Haw. 1998). Plaintiffs' challenges to the no jeopardy and no adverse modification conclusions, however, are based on the same arguments.

[12] Satellite telemetry is a method of tracking the movements of Steller sea lions. A satellite linked time-depth recorder ("SDR"), which is composed of a small package of electronics, is glued to a sea lion's back. S8-549 at 135. The SDR transmits depth information from the unit up to orbiting satellites which then triangulate the source beam to estimate a location of the animal. Id. Between 1990 and March 2001, 98 SDRs were deployed on Steller sea lions in the western stock. Id.

Using telemetry data to track Steller sea lion locations, NMFS concluded that 75% of Steller sea lion foraging effort occurs within 10 nm of shore and only 25% occurs beyond the 10 nm zone.[13] Based on this data, NMFS for the first time designated varying importance levels to different areas of critical habitat. Id. at 142-144, Table 5.2 at 145. Thus, critical habitat from 0-3 nm was rated as of "high" concern, 3-10 nm was also of "high" concern, 10-20 nm was of "low to moderate" concern, and beyond 20 nm was of "low" concern. Id., Table 5.2 at 145. The 2001 BiOp also re-evaluated the importance of spatial, temporal, and global effects of fishing. Id. Spatial dispersion (outside 10 nm) was rated of "low" concern, temporal dispersion (outside 10 nm) was rated of "low to moderate" concern, and global fishing effects were rated of "moderate" concern. Id.

Plaintiffs challenge the development and use of the "zonal approach" as an effective tool to evaluate conservation methods. Plaintiffs contend that the data NMFS relies upon does not support the conclusions drawn under the "zonal approach" regarding the relative importance of each segment of critical habitat. Plaintiffs argue, therefore, that any fishing plan which relies upon the varying importance of different areas of critical habitat is arbitrary and capricious. Defendants assert that the new telemetry data is sufficient to support the conclusions drawn in the 2001 BiOp, and that the Court is required to give deference to the conclusions of the agency's experts in regard to this data. Plaintiffs raise two arguments regarding the telemetry data: (a) the telemetry data relied upon by NMFS did not present any new insight into Steller sea lion behavior but simply confirmed facts already known and therefore cannot be rationally related to a different view of critical habitat, and (b) NMFS ignored the significant caveats placed on the data by the scientists presenting the data and therefore failed to rationally relate the facts found in the data to the choices made in developing the Amended RPA. Defendants respond that the data provided more insight and knowledge as to Steller sea lion foraging habits and is rationally connected to the conclusions

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[13] Plaintiffs allege that this conclusion itself is arbitrary and capricious. This argument will be discussed further below.

drawn. Defendants also argue that NMFS discussed and properly evaluated each of the caveats connected to the data.

a. Is the Telemetry Data Sufficiently "New" in Order to Support the New Conclusions Regarding Critical Habitat?

Plaintiffs argue that the zonal approach is arbitrary and capricious because it is based on information that was previously known to NMFS. Plaintiffs contend that when the agency alters its earlier conclusions, it must produce evidence that supports a change, and if there is no new data or evidence, any change is arbitrary and capricious. Plaintiffs rely on Motor Vehicle Manufacturers Association v. State Farm Mutual Automobile Insurance Co., 463 U.S. 29, 42 (1983), in which the Court held that "an agency changing its course by rescinding a rule is obligated to supply a reasoned analysis for the change beyond that which may be required when an agency does not act in the first instance." Plaintiffs admit, however, that all of the telemetry data considered in the 2001 BiOp was not available to NMFS in earlier opinions. See Plaintiffs' Motion for Summary Judgment, docket no. 544, at 29. Plaintiffs' argument is that the additional data did not "provide[] a substantially different picture of Steller sea lion use of habitat than that previously known and understood by NMFS . . . [and] simply served to reinforce the agency's previous conclusions." Id.

Plaintiffs' argument lacks merit because the zonal approach does not fundamentally alter any prior conclusions NMFS made. In prior biological opinions, NMFS treated all critical habitat in the same manner, although NMFS recognized that there was a possibility that not all critical habitat was of the same importance to Steller sea lions. See, e.g., S6-249 at 95-96. The additional cumulative knowledge presented in the telemetry data for the first time in the 2001 BiOp led NMFS to conclude that critical habitat ought to be divided into sections. NMFS did not reverse or rescind earlier scientific conclusions, but merely concluded on the basis of additional knowledge – which did not contradict earlier considerations – that a more refined approach to reviewing impacts on critical habitat was possible.

The administrative record demonstrates that the satellite telemetry data available in 2001 was sufficiently "new." The 2001 BiOp states:

> There is considerable information contained in the telemetry data already collected, and more coming in daily from recent deployments. Numerous manuscripts are in preparation, which reflect a range of hypotheses and opinion on the utility of such data. In many ways this biological opinion is on the leading edge, utilizing all of the newly available data to make the best determination we can to provide for the survival and recovery of Steller sea lions. . . . NMFS must use the best available scientific and commercial data to determine whether the proposed action is likely to jeopardize the continued existence of Steller sea lions or destroy or adversely modify their critical habitat.

S8-549 at 142. The 2001 BiOp acknowledges that satellite telemetry data was considered in the FMP BiOp, but "the level of analysis at that time was very coarse." Id. at 135; see S6-249 at 87-88. The 2001 BiOp goes on to state that at the time of the FMP BiOp, the "level of detail for the analysis was at a fairly broad level of critical habitat, and provided little information for treating different parts of critical habitat in different ways. This information was crucial in making the determination that all of critical habitat should be protected in a substantial way." S8-549 at 137. During the RPA Committee[14] process used to develop the Amended RPA, several presentations regarding telemetry data were given to the RPA Committee. Id. at 137-39. These presentations included analyses of data that had not been available earlier. Id. at 139. The conclusions that led to the zonal approach were based "on these new preliminary reports" that analyzed the data. Id.

The 2001 BiOp provides a rational explanation for how the new analysis led to the further refinement of conclusions to be drawn from telemetry data. It clearly states in conclusion that:

> The results from current telemetry analyses by NMML, ADF&G, and Dr. Andrews provide a basis to begin evaluating sea lion foraging ecology at a level of detail not previously possible. Although most of this data was available during the drafting of

[14] The RPA Committee was created by the Council to review scientific and commercial data, provide recommendations for Steller sea lion protection measures, and develop the Amended RPA. S8-549 at 12.

> the FMP biological opinion, the analyses described here were not. As described above, NMFS previously considered all critical habitat to be equally as important to sea lion foraging. In other words, we knew animals spent a lot of time close to shore, but weren't able to quantify that amount. Preliminary analyses of the frequency and distribution of sea lion locations is described in ADF&G and NMFS (2001), which provides a rudimentary attempt to relate sea lion distribution with foraging effort in order to estimate competitive overlap with fisheries.

Id. Accordingly, the Court concludes that using telemetry data in the 2001 BiOp to evaluate impacts on critical habitat was not arbitrary and capricious.

b. Did NMFS Properly Review the Caveats Placed on the Telemetry Data?

Plaintiffs argue that the 2001 BiOp improperly concluded that the telemetry data represents foraging sites of the Steller sea lions. There does not appear to be any dispute that the telemetry data is the "best available science" for tracking where Steller sea lions are *located*. The dispute is whether it is sufficient evidence to make a rational determination of where Steller sea lions *forage*. In addition, Plaintiffs contend that the conclusions reached ignore the limitations placed on the data by the nature of satellite telemetry. Plaintiffs' argument is that NMFS ignored the caveats that the scientists placed on the data and analyses, thereby making NMFS's conclusions arbitrary and capricious.

(i) Location vs. Foraging

The 2001 BiOp notes that the author of the telemetry studies "pointed out the danger of using the telemetry data to estimate the percentage of time the instrumented sea lions may have spent at specific distances from shore, and then further inferring from that information the spatial distribution of foraging bouts." S8-549 at 137-38. Additionally, the 2001 BiOp notes that another "preliminary study demonstrated that observations of where sea lions travel and dive do not necessarily allow one to distinguish productive feeding areas from unproductive ones." Id. at 138. In using the telemetry data to make conclusions regarding the importance of different areas of critical habitat, NMFS recognized that contrary to these caveats, "[t]he critical assumption that must be made here is that the observed at-sea distributions are indicative of sea lion foraging" and as "NMFS has no indication that disproportionate benefits would accrue from foraging at various distances from land, therefore drawing from the information above that roughly 75% of the at-sea distributions occur within 10 nm from shore, we can then speculate that about 75% of the foraging effort occurs within 10 nm from shore . . . ." Id. at 139. Basically, NMFS recognized that the telemetry data does not necessarily describe foraging behavior accurately. However, because there is no information that Steller sea lions forage more extensively or successfully further from shore, NMFS found it reasonable to attribute equal foraging success to each of the areas where Steller sea lions are found. Thus, if Steller sea lions forage equally successfully in both the areas of 0-10 nm and 10-20 nm from shore, and spend approximately three times longer in the 0-10 nm zone, NMFS found it reasonable to conclude that the 0-10 nm zone is three times as important to the Steller sea lions. Id.

The fundamental disconnect between Plaintiffs and Defendants is in their interpretation of the telemetry studies. Defendants state that they are acting conservatively by equating every site with foraging, and that clearly Steller sea lions could not be foraging where they never go. Plaintiffs argue that because there is no evidence that nearshore locations constitute foraging areas, it is equally likely that all foraging takes place outside the 0-10 nm zone or that equal amounts of foraging take place in each zone, so NMFS should not assume that every location is a foraging location. In response to this caveat that location does not necessarily equate with foraging, Defendants have supplied a rational explanation for how and why they chose to ignore the caveat. NMFS states that the telemetry data is the best science available for evaluating foraging areas and that there is no science available to show whether "there are areas of ocean, a time of day or distance from land that is more or less important or effective for a foraging Steller sea lion." Id. Plaintiffs argue that the Court should find their reading of the data to be more reasonable; however, that is not the Court's responsibility. The Court concludes that NMFS's conclusions are supported in the record and were not arbitrary and capricious.

(ii) Nearshore Bias

The caveat that location does not necessarily correspond to successful foraging is only the first of the caveats regarding the telemetry data. The caveat NMFS described in the 2001 BiOp as "one of the most confounding" is that "Steller sea lion at-sea behavior is considered to be different near haulouts and rookeries than it is further offshore." Id. at 139. Steller sea lion nearshore behavior involves spending a great deal of time on the surface, allowing the telemetry transmitters to transmit data. Id. at 139-40. The offshore activity tends to include more deep diving behavior, during which the transmitters would be unable to transmit location data. Id. at 140. Thus, this differing behavior pattern creates a bias in the data because of the nature of satellite telemetry.[15] Steller sea lion location data will only be recorded for those areas in which a Steller sea lion stays above water or resurfaces repeatedly during a ten-minute period. Telemetry data will thus fail to record location data for much offshore activity.[16] Accordingly, "the probability of obtaining at-sea locations near haulouts and rookeries is likely higher than when [the Steller sea lions are] further offshore," thereby biasing the data towards a finding that more foraging occurs nearshore. S8-576 at 13. In an effort to account for this bias, the authors of the telemetry study filtered the data by discounting 90% of the at-sea locations from the 0-2 nm zone. Id.; S8-549 at 140.

This filtered data was considered in the 2001 BiOp, but did not alter the 2001 BiOp's conclusion that the 0-10 nm zone was of greater importance to Steller sea lions. S8-

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[15] An SDR must be above the water in order to provide a signal to the orbiting satellite. S8-549 at 135. An SDR will attempt to send a signal to a satellite every forty seconds if the sensor determines that the instrument is above the surface. Id. If the instrument is not above water it will attempt to send a signal the next time it is above water. Id. Multiple transmissions must be received within a ten-minute period in order for a satellite to estimate a location. S8-576 at 13.

[16] For example, the telemetry data for adult females in the GOA during the summer breeding season shows that Steller sea lions "made distant offshore trips >100 nm from shore, yet locations were not obtained between 8 and 100 nm." S8-576 at 13. Additionally, other data demonstrates that because "the first prey ingestion event occurs at least 0.9 hours after departure from a rookery. . . . a portion of nearshore at-sea locations do not represent locations where animals successfully obtained prey." Id.

549 at 141 (stating that both the filtered and unfiltered data demonstrate that the 0-3 and 3-10 nm zones were the most important based on Steller sea lion locations, "except for adults in winter and pups and juveniles in summer"). However, a closer look at the filtered data in fact demonstrates that in summer the 3-10 nm zone and the 10-20 nm zone are of approximately the same importance (14.9% of observations vs. 12.6% of observations) for pups and juveniles, and that more than 50% of the at-sea locations for pups and juveniles in the summer were outside of the 0-10 nm zone. Id. at 142, Table 5.1b. Similarly, for adult Steller sea lions in winter the amount of time spent in the 3-10 nm zone (14.7%) was roughly equivalent to the amount spent in the 10-12 nm zone (11.8%), and more than 50% of the at-sea locations were outside the 0-10 nm zone. Id.

Defendants argue that the categories of pups and juveniles in summer and adults in winter should not be considered when drawing conclusions from telemetry data. Id. at 140-41; Transcript, docket no. 571, at 48-55. Excluding this data means that much of the telemetry data is not considered. In the summer, excluding pups and juveniles reduces the amount of telemetry data by over two-thirds. S8-549 at 142, Table 5.1b. Defendants further argue that telemetry data for adults need not be considered at all because pups and juveniles are the key population segment that is driving the Steller sea lion decline. Transcript, docket no. 571, at 52- 54. The 2001 BiOp states that juveniles that have been weaned are "the age class likely to be a critical factor in the current decline of the western population" and that "pups and juveniles are the most likely part of the sea lion population affected by nutritional stress, localized depletions, and predation . . . ." S8-549 at 140-41, 139. Telemetry research has focused on pups and juveniles because the leading hypothesis is that their survival is central to the decline of Steller sea lions. Id. at 136. Although the record also indicates that "considerable evidence suggests that decreased reproductive success" and "changes in adult survival may also have contributed to the decline," S6-249 at 82, 83, NMFS's focus on the telemetry data for pups and juveniles is not arbitrary and capricious.

Defendants also argue that an evaluation of the telemetry data should focus on only the winter months. The 2001 BiOp states that the winter months are the most important for Steller sea lions because of harsher environmental conditions and increased Steller sea lion metabolic needs. S8-549 at 78, 94-95. However, the 2001 BiOp also states that Steller sea lions "need more or less continuous access to food resources throughout the year," and that "food availability is surely critical year round, although it may be particularly important for young animals and pregnant-lactating females in the winter."[17] Id. at 94, 95. Furthermore, the 2001 BiOp explains that the increased number of at-sea locations for pups and juveniles in the summer is likely the result of the fact that "most of the pups/juveniles instrumented during the fall and winter were still nursing," and therefore "would be less likely to travel far from shore." Id. at 140. The at-sea location data for pups and juveniles in summer is therefore more representative of foraging than the winter data because "by spring and early summer, some of these animals are weaned and they begin to forage on their own further from shore." Id. Thus, the filtered data actually demonstrates that the 3-10 nm zone and the 10-20 nm zone are of more or less equal foraging importance for the most critical population segment, in contrast to NMFS's conclusion that the 3-10 nm zone is of "high" concern and the 10-20 nm zone is of "low to moderate" concern. Id. at 145, Table 5.2. Therefore, the conclusion that the filtered data equally supports the zonal approach is not rationally related

[17] The record indicates that reproduction places increased metabolic demands on adult females, which winter conditions exacerbate. S8-549 at 94; S6-249 at 81.

to the data the expert scientists presented.[18]

Defendants argue that if either the unfiltered or filtered data supported the conclusions the 2001 BiOp reached, the Court would not have to find that NMFS's decision was not rational. Transcript, docket no. 571, at 47. However, NMFS is required to use the "best available scientific and commercial data." S8-549 at 142. Given that the agency recognized that the unfiltered data contained a "confounding" bias, id. at 139, NMFS's reliance on unfiltered telemetry data to support its conclusions would be arbitrary and capricious. Agency action is arbitrary and capricious where the agency has failed to "articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983). Although "an agency must have discretion to rely on the reasonable opinions of its own qualified experts," Marsh v. Or. Natural Resources Council, 490 U.S. 360, 378 (1989), the presumption of agency expertise can be rebutted if the decision is not reasonable. See Defenders of Wildlife v. Babbitt, 958 F. Supp. 670, 679 (D.D.C. 1997). In this case, the experts stated that the unfiltered data contained a significant bias and in order to better equate the location data with foraging, the experts filtered the data. The filtered data demonstrates that Steller sea lions use the 3-10 nm zone and the 10-20 nm zones almost equally. S8-549 at 142, Table 5.1b. NMFS has failed to provide any rational

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[18] The filtered data for the most important Steller sea lion population group during the season that they are foraging demonstrates that they spend approximately equal amounts of time in the 3-10 nm zone and the 10-20 nm zone. S8-549 at 142, Table 5.1b.

ZONE	PUPS/JUVENILES (summer)
0 -3 nm	22.1 %
3-10 nm	14.9 %
10-20 nm	12.6%
beyond 20 nm	50.4%

explanation for its choice to ignore significant portions of the filtered data. NMFS has also failed to provide any rational connection between the filtered data and its implementation of the zonal approach.

The Court notes that when the percentage of time the Steller sea lion spends in the 0-3 nm zone is added to the time spent in the 3-10 nm zone, the filtered data demonstrates that the 0-10 nm zone is approximately three times more important than the 10-20 nm zone. Nonetheless, this sum does not support the differing ranking of importance of the 3-10 nm and 10-20 nm zones, id. at 145, Table 5.2; id. at 170 (describing the 3-10 nm zone as "one of the highest areas of concern for foraging Steller sea lions" and the 10-20 nm zone as "of low to moderate concern"), because the relevant filtered data shows that Steller sea lions use the 3-10 nm and the 10-20 nm zones almost equally. See supra note 18; S8-549 at 142, Table 5.1b. Thus, NMFS cannot rationally rely on the difference in the ranking of the zones in developing the Amended RPA, which allowed fishing in portions of the 10-20 nm zone but continued to prohibit fishing in the 3-10 nm zone.

Accordingly, the Court finds that the 2001 BiOp's no jeopardy and no adverse modification conclusions are arbitrary and capricious because they rely on the zonal approach to management which is not rationally connected to the data presented.[19]

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[19] Because the Court concludes that the zonal approach is not rationally connected to the telemetry data presented, the Court also finds that the DeMaster Study, S8-650, cannot independently support the Amended RPA. The DeMaster Study attempted to make a qualitative comparison between the FMP BiOp RPA and the Amended RPA in order to determine whether they were roughly equivalent in their effect on the Steller sea lion population. S8-549 at 161; S8-650 at 2. The DeMaster Study compared the FMP BiOp worst case scenario (0.77% annual decrease) with a more realistic scenario under the FMP BiOp (0.05% annual increase), and with the projected scenario under the Amended RPA (0.25% annual decrease). S8-549 at 156, Table 5.6. One of the basic assumptions of the study was that different areas of critical habitat were more important than others. Id. at 161-62; S8-650 at 12.

The Court notes that because the FMP BiOp found that a 0.7% estimated annual decrease did not cause jeopardy or adverse modification, S6-249 at 300, it was rational for the 2001 BiOp to conclude that a lower estimated annual decrease of 0.25% would not cause jeopardy or adverse modification. S8-549 at 162 ("Given the uncertainty in the available data and the qualitative nature of this analysis, . . . the difference in the expected trajectories is insignificant and . . . it is reasonable to conclude that the [RPA and Amended RPA] are approximately equal in avoiding adverse effects with Steller sea lions."). Plaintiffs cannot demonstrate that the no

2. Failure to Analyze the Likely Effects on Steller Sea Lions, Their Prey, and Their Critical Habitat Under the Amended RPA.

In the alternative, even if the zonal approach were rationally related to the telemetry data presented, NMFS must still analyze the likely effects of the Amended RPA on Steller sea lions, their prey, and their critical habitat before reaching a no jeopardy or adverse modification conclusion in the 2001 BiOp. The Court finds that Defendants failed to perform the appropriate analysis of the Amended RPA before reaching the no jeopardy and no adverse modification conclusions in the 2001 BiOp. Plaintiffs concede that the FMP BiOp addressed the relevant factors under the ESA for determining whether the fisheries would adversely affect the Steller sea lion's critical habitat or jeopardize the Steller sea lion's continued existence. See, e.g., S6-249 at 232-33 (setting out seven questions to be answered by the BiOp in order to evaluate the effect of fisheries on Steller sea lion critical habitat). Plaintiffs contend that in evaluating the Amended RPA, NMFS failed to properly conduct the necessary seven-question analysis set forth in the FMP BiOp at 232-33.[20] Defendants argue that they were not required to duplicate the seven-question analysis in the 2001 BiOp. Defendants also argue that the 2001 BiOp incorporates the findings of the FMP BiOp and that sufficient analysis exists in the administrative record to support the Amended RPA. See

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jeopardy or adverse modification conclusion of the 2001 BiOp is arbitrary and capricious based on the choice of a less conservative alternative.

[20] The seven questions in the FMP BiOp at 232-233 are:
(1) Do Steller sea lions forage on the target fish species?
(2) Do Steller sea lions forage on the target fish species at a rate of at least 10% occurrence?
(3) If yes to Number 2, does the size of Steller sea lion prey overlap with the size caught by commercial fisheries?
(4) If yes to Number 2, does the fishery overlap spatially with the area used by Steller sea lions to forage on this species?
(5) If yes to Number 2, [d]oes the fishery operate at the same time Steller sea lions are foraging on the fish species?
(6) If yes to Number 2, [d]oes the fishery operate at the same depth range that Steller sea lions are using to forage on the fish species?
(7) If yes to 1-6, does that fishery operate in a spatially or temporally compressed manner in Steller sea lion critical habitat?

Defendant-Intervenor's Reply, docket no. 560, at 19 ("[The 2001 BiOp] did not abandon or ignore the analyses performed in the FMP BiOp, but neither did it re-invent the wheel, as Plaintiffs seem to think it should have."); Federal Defendants' Reply, docket no. 558, at 12 ("Plaintiffs' 'lead' argument then simply boils down to a request that NMFS restate the analyses and conclusions that it had already presented in the FMP BiOp even though the 2001 BiOp incorporates, without supplanting, the FMP BiOp.").

a. Was the Method NMFS Used to Determine No Jeopardy and No Adverse Modification Proper Under the ESA?

Plaintiffs argue that Defendants were required to answer the seven questions, especially the last one because it is weighted twice as much as the others, before reaching a no jeopardy or no adverse modification conclusion. S6-249 at 232-33; Transcript, docket no 571, at 14. Defendants claim that the purpose of the questions was to look at *overlap* in time, space, and species of concern to Steller sea lions, and that the narrow proposed action of the 2001 BiOp dealt only with three prey species for which the seven-question analysis had already been done in the FMP BiOp. Transcript, docket no. 571, at 64-65. Thus, Defendants argue it was logical not to go back and reevaluate. Id. at 64.

The purpose of the seven-question test set forth in the FMP BiOp was "to determine which fisheries may be adversely affecting Steller sea lions and whether or not those affects [sic] are likely to jeopardize their continued existence or adversely modify their critical habitat." S6-249 at 232. Thus, Defendants' argument that these seven questions went only to the issue of overlap is faulty. However, the ESA does not require that Defendants conduct this particular seven-question analysis, as long as there is some analysis to support the conclusions drawn in the 2001 BiOp. The Court notes that NMFS's use of a three-step inquiry in the 2001 BiOp to determine whether the proposed action would cause jeopardy to Steller sea lions is an alternative method which satisfies the ESA requirements regarding the analysis required regarding jeopardy.[21] S8-549 at 16, 132, 178. For the inquiry regarding adverse modification of critical habitat, NMFS engaged in "a more qualitative analysis using all available scientific and commercial information." Id. at 16. The Court finds that this method of evaluating adverse modification is also sufficient under the ESA, as long as NMFS explains its analysis as it did in the 2001 BiOp. Id. at 182-84. The Court must therefore determine whether the *content* of the analysis in the 2001 BiOp, coupled with the previous analysis in the FMP BiOp that the 2001 BiOp incorporated, is sufficient under the ESA to support the conclusions drawn in the 2001 BiOp.

b. Does Sufficient Analysis Exist in the Administrative Record to Support the No Jeopardy or Adverse Modification Conclusion of the 2001 BiOp?

The 2001 BiOp is limited to a review of the Amended RPA, which was necessary because of the jeopardy and adverse modification conclusions of the FMP BiOp. The Council found that the Amended RPA could replace the FMP BiOp RPA because "given the new biological information on Steller sea lions, . . . there were other possible ways to avoid jeopardy and adverse modification for sea lions and their habitat." Id. at 18. Initially, in order to avoid the effects of competition between the fisheries and the Steller sea lion for prey, the FMP BiOp set forth an RPA that required sections of critical habitat from 0-20 nm to be closed year-round to directed fishing for pollock, Pacific cod, and Atka mackerel. S6-249 at 274.[22] The major change presented by the Amended RPA and challenged by Plaintiffs is the increase of allowable fishing in the 10-20 nm zone of critical habitat. The specific re-

[21] This three-step inquiry required NMFS to: (1) Identify the probable direct and indirect effects of the proposed action on the action area, (2) Determine whether reductions in Steller sea lion reproduction, numbers, or distribution would reasonably be expected, and (3) Determine if any reductions in Steller sea lion reproduction, numbers, or distribution could be expected to appreciably reduce the Steller sea lion's likelihood of surviving and recovering in the wild. S8-549 at 16, 178.

[22] The RPA closed areas where "approximately 16% of GOA pollock and 28% of GOA Pacific cod catches, 23% of EBS pollock, 24% of EBS Pacific cod, and 2% of BSAI Atka mackerel, 53% of AI pollock, 21% of AI Pacific cod, and 44% of BSAI Atka mackerel catches have occurred [from 1998-1999]." S6-249 at 277.

openings in the 10-20 nm zone of critical habitat that the Amended RPA contemplates are outlined in Table 3.1 of the 2001 BiOp. S8-549 at 39-42. Table 5.4 presents a comparison of the FMP BiOp RPA measures and the Amended RPA. Id. at 153.

Plaintiffs argue that because NMFS provided no explanation of the catch levels occurring in critical habitat, the Court cannot find that NMFS's determination of no jeopardy and no adverse modification in the 2001 BiOp was not arbitrary and capricious. Transcript, docket no. 571, at 87-88. The FMP BiOp concluded that the amount of fishing within critical habitat caused adverse modification of critical habitat and jeopardy to the continued existence of Steller sea lions, partly because of nutritional stress. S6-249 at 251, 268, 270. The FMP BiOp did not, however, consider whether nutritional stress was due to over-fishing within the 0-10 nm zone or the 10-20 nm zone because it was treating all areas of critical habitat alike, since the zonal approach to management had not been developed. See, e.g., id. at 274. Because the FMP BiOp did not utilize a zonal approach in concluding that fishing within critical habitat caused jeopardy and adverse modification, if all of the fishing within critical habitat were occurring within the 10-20 nm zone, the Amended RPA would not eliminate the cause of the nutritional stress.[23] The Amended RPA will not avoid jeopardy and adverse modification unless it actually alters fishing patterns within critical habitat. The administrative record contains no information as to whether the Amended RPA will alter the fishing patterns that were found to cause jeopardy and adverse modification in the FMP BiOp. The FMP BiOp notes that under the 1999 fishing regulations, the "portion of critical habitat that remained open to the pollock fishery consisted primarily of the area between 10 and 20 nm from rookeries and haulouts in the GOA and parts of the eastern Bering Sea special foraging area." Id. at 256. In addition, the 1999 fishing regulations maintained the 10 nm trawl exclusion zone around important rookeries and haulouts, reduced the amount of

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[23] Fishing in the 10-20 nm zone may impact Steller sea lions foraging in the 0-10 nm zone because prey migrate back and forth across these zones. S8-549 at 143. This is sometimes referred to as the "edge effect." The 2001 BiOp does not evaluate the edge effect.

allowable catch of Atka mackerel that could come from within critical habitat, and closed portions of critical habitat between 10-20 nm. Id. at 255. The FMP BiOp determined that these fisheries, which permitted some level of fishing in the 10-20 nm zone, reduced the likelihood of Steller sea lion foraging effectiveness and reduced the likelihood of Steller sea lion survival. Id. at 258. The Amended RPA neither assesses the level of fishing it allows in this zone of "low to moderate" importance, nor explains how it will change the negative impact on Steller sea lions that the FMP BiOp found.

Although the 2001 BiOp compares the RPA to the Amended RPA, the 2001 BiOp does not compare the Amended RPA to the FMP previously evaluated in the FMP BiOp. The 2001 BiOp presents no information regarding where fishing takes place in critical habitat or where prey are located within critical habitat. Thus, there is no information known as to how much the Amended RPA will reduce fishing within critical habitat. See S6-249 at 277 (describing the reductions in fishing that will occur because of closures of critical habitat under the FMP BiOp RPA). Although the 2001 BiOp presents new data regarding where Steller sea lions are located, an evaluation of where Steller sea lions forage does not present a complete picture of the effects of the Amended RPA. Fishing outside the forage zones may cause localized depletions within the forage zones, which could then cause adverse modification of the "high" importance areas of critical habitat and impact the Steller sea lions. For example, the 2001 BiOp concluded that "the use of closure areas in the most important foraging zones alleviates the need for small catch limits in areas outside of 10 nm from shore that were previously considered to be integral to the RPA in the FMP biological opinion." S8-549 at 143. However, there is no analysis of how the newly opened fishing areas will impact the "most important foraging zones." Id. Unless and until it is determined that it is fishing within the 0-10 nm zone that is the cause of the nutritional stress, or the agency explains in the administrative record why the proposed modifications in the 10-20 nm zone will not cause jeopardy or adverse modification, any conclusion that closures of only the 0-10 nm zone will remedy the jeopardy and adverse modification found in the FMP BiOp is arbitrary. Therefore, even if the Court found that the 2001 BiOp correctly evaluated the differing importance of the zones of critical habitat, nowhere does the 2001 BiOp evaluate the differing effect of the current and proposed level of fishing on those zones of critical habitat and the Steller sea lions. Without an analysis of how the fishing within critical habitat impacts the differing zones of importance, or an explanation *in the record* of why such an analysis was not required, it is not possible for the Court to find that the agency has "articulated a rational connection between the facts found and the choice made." Friends of Endangered Species, Inc. v. Jantzen, 760 F.2d 976, 982 (9th Cir. 1985) (quoting Baltimore Gas & Elec. Co. v. Natural Resources Defense Council, Inc., 462 U.S. 87, 105 (1983)). In short, the 2001 BiOp does not contain a viable analysis of cause and effect, which is exactly what the ESA requires. This failure is fatal to the 2001 BiOp.

Defendant-Intervenors Pacific Cod Freezer Longliners argue that the hook-and-line gear method of fishing is passive and does not result in any concentrated removal of prey so as to jeopardize Steller sea lions or adversely modify their critical habitat. Although evidence in the administrative record supports the position that hook-and-line fishing may be less likely to cause localized depletion, there is a lack of sufficient scientific evidence to support a conclusion that the hook-and-line fishery does not cause jeopardy or adverse modification. S6-249 at 215; S8-549 at 148-49. The 2001 BiOp states:

> These data suggest that the hook-&-line fishery in the BSAI Pacific cod fishery is more dispersed than the trawl fishery, and may be less likely to cause localized depletions of prey for Steller sea lions. However, to stress again, the critical link between fisheries removals . . . and the effects on sea lions is so poorly understood that we cannot un-equivocally [sic] say that these gear types do or do not adversely affect Steller sea lions.

S8-549 at 149. Thus, the Court cannot find that the hook-and-line fishery does not cause jeopardy to Steller sea lions or adverse modification of Steller sea lion critical habitat. Moreover, NMFS did not analyze the hook-and-line fishery as a separate fishery, and it is beyond the Court's role to conduct such an analysis.

Accordingly, in the alternative, the Court concludes that the 2001 BiOp's finding of no adverse modification of critical habitat and no jeopardy to the continued existence of Steller sea lions is arbitrary and capricious because the necessary analysis of the impact of the Amended RPA on Steller sea lions, their prey, and their critical habitat was not performed.

For the foregoing reasons the Court GRANTS Plaintiffs' Motion for Summary Judgment and DENIES Defendants' Motion for Summary Judgment as to Claims Eight and Nine of the Supplemental Complaint.

IV. CONCLUSION

For the foregoing reasons the Court GRANTS Plaintiffs' Motion for Summary Judgment as to Claims Eight and Nine and DENIES Plaintiffs' Motion for Summary Judgment as to Claim Ten, docket no. 544. For the same reasons the Court DENIES Defendants' and Defendant-Intervenors' Motions for Summary Judgment as to Claims Eight and Nine and GRANTS Defendants' and Defendant-Intervenors' Motion for Summary Judgment as to Claim Ten, docket nos. 551, 553.

The Court REMANDS the 2001 BiOp to the National Marine Fisheries Service for further action in compliance with this Order.

IT IS SO ORDERED.

DATED this 17th day of December, 2002.

THOMAS S. ZILLY
UNITED STATES DISTRICT JUDGE

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

January 16, 2003

MEMORANDUM FOR: William T. Hogarth
Assistant Administrator For Fisheries

FROM: For James W. Balsiger
Administrator, Alaska Region

SUBJECT: Agency Response To The Steller Sea Lion 2001 Biological Opinion Remand Order – DECISION MEMORANDUM

Judge Zilly has remanded to NMFS the Steller Sea Lion 2001 Biological Opinion (Opinion) for further action in compliance with his December 18, 2002, Order. The Judge is, however, allowing the Opinion to remain in effect until June 30, 2003. Although Judge Zilly has not ordered NMFS to respond to the remand by June 30, 2003, NMFS is exposed to additional litigation after this date.

I request that you concur with my recommendation that we prepare supplemental information to the 2001 Opinion that addresses only the issues in the Opinion that were identified by Judge Zilly in his Order. I have been advised by NOAA General Counsel that this approach is both defensible and represents an appropriate level of response to the Court Order. Further, this approach results in less litigation exposure because it leaves undisturbed those parts of the Opinion that were not challenged or were unsuccessfully challenged in the litigation. The supplement would be based on the best scientific and commercial data including the results now available of recent studies on the issues addressed in the Order and would allow for coordination to occur between NMFS and the North Pacific Fishery Management Council in the development of the Court Order response.

BACKGROUND

On December 18, 2002, United States District Court Judge Zilly granted plaintiff's motion for summary judgment (Greenpeace v. NMFS, No. C98-492Z). Judge Zilly found that the 2001 Steller sea lion Opinion was arbitrary and capricious and remanded it to NMFS for further action. Judge Zilly identified two elements leading to that determination:

First, he found that NMFS's determination that the near shore zone of critical habitat (3 nm to 10 nm) is 3 times more important to the foraging needs of Steller sea lions than the offshore critical habitat (10 nm to 20 nm) was not supported by the filtered telemetry data cited by NMFS and stating that "the relevant filtered data shows that Steller sea lions use the 3-10 nm and the 10-20 nm zones almost equally";

Second, Judge Zilly found that NMFS failed to adequately analyze the likely effects of fishing under the Steller sea lion protection measures on Steller sea lions, their prey, and their critical habitat. In this part of the Order, Judge Zilly concluded that even if NMFS had correctly evaluated the differing importance of the zones of critical habitat, the 2001 Opinion failed to evaluate "the differing effect of the current and proposed level of fishing on those zones of critical habitat and Steller sea lions. Without an analysis of how fishing within critical habitat impacts the differing zones of importance, or an explanation in the record of why such an analysis was not required, Judge Zilly found that NMFS failed to articulate a rational connection between the facts found and the choice made for this item in the biological opinion.

Consequently, the completed remand must address the following issues noted on pages 27 and 30-32 of the December 18 Order:

1. The factual basis in the telemetry data (or in other new data) for the relative weighting of importance of critical habitat zones;

2. Comparison of the 1999 "jeopardy" fishery pattern analyzed in the FMP Biological Opinion and the fishery pattern under the revised Steller sea lion protection measures.

   This comparison should (1) address the levels of fishery removals in the zones of critical habitat and in critical habitat overall, and the effect of these removals on seasonal prey availability to Steller sea lions of pollock, Pacific cod, and Atka Mackerel in critical habitat; (2) address the so-called "edge effect" of fishing in the offshore critical habitat (10 nm to 20 nm zone) on the nearshore critical habitat and the sea lions that forage there; and (3) explain why the revised Steller sea lion protection measures relieve the impacts that caused jeopardy and adverse modification of critical habitat.

We recommend supplementing the 2001 Opinion with information that addresses these concerns identified by Judge Zilly in his December 18 Order. The information used would be based on the best scientific and commercial data including the results of studies now available that are responsive to the concerns identified in the Order.

Summary: I recommend that you concur with this approach.

[signature] 1-30-03

I concur with your recommendation Date

__________ __________

I do not concur with your recommendation Date

Executive Summary

Theory helps us bear our ignorance of fact.
—George Santayana, *The Sense of Beauty*

Steller sea lions are found along the North Pacific rim from California to Japan with about 70% of the population living in Alaskan waters. The Alaskan population declined precipitously during the 1970s and 1980s and continued to decline at a slower rate during the 1990s. Overall, the Alaskan population has declined by more than 80% over the past 30 years. In 1990 the Steller sea lion was listed as a threatened species, and in 1997 the population west of Cape Suckling (longitude 144° W) was listed as endangered under the Endangered Species Act (ESA). The eastern population (southeast Alaska to California) has increased gradually throughout most of its range since the 1970s, but this stock remains listed as threatened.

The causes of the decline of the western stock have been the subject of much speculation and debate despite numerous analyses and many detailed reports. There is no widely accepted answer to the question of why the Steller sea lion population is declining. What might otherwise be an obscure ecological mystery has become an issue of great regional and even national interest because of the regulatory implications for management of the large commercial fisheries in the North Pacific. These fisheries target many of the fish species that comprise the prey base for Steller sea lions.

In November 2000 the ESA consultation prepared by the National Marine Fisheries Service concluded that the Alaska groundfish fishery posed a threat to the recovery of the Steller sea lion and imposed more restrictive measures on the management of the fishery. Concern that the new regulations would bring significant social and economic disruption prompted Congress to direct the North Pacific Fishery Management Council to sponsor an independent scientific review by the National Academy of Sciences on the causes of the Steller sea lion decline and the potential efficacy of the new management measures (Box ES.1). This report represents the results of that review.

BOX ES.1

Statement of Task

This study will examine interactions between Alaska groundfish fisheries and Steller sea lions (*Eumetopias jubatus*) and the role of these fisheries in the evolving status of the sea lion population. The focus of the study will be (1) the status of current knowledge about the decline of the Steller sea lion population in the Bering Sea and Gulf of Alaska ecosystems; (2) the relative importance of food competition and other possible causes of population decline and impediments to recovery; (3) The critical information gaps in understanding the interactions between Steller sea lions and Alaska fisheries; (4) the type of research programs needed to identify and assess potential human and natural causes of sea lion decline; and (5) the components of an effective monitoring program, with yardsticks for evaluating the efficacy of various management approaches.

CAUSES OF DECLINE

Over the past 200 years many populations of terrestrial and marine mammals have declined precipitously, some to the point of extinction. Most declines of marine mammals have been attributed to human activities, typically as a result of commercial harvest for fur, meat, and oil or because of fishery interactions, through incidental catch in fishing nets, disturbance from fishing activities, or predator control programs. Suspension of these activities reduces the risk of extinction, but for some long-lived species recovery may take decades.

The case of the dramatic decline in the Steller sea lion population has been less straightforward. Steller sea lions have not been subject to large commercial harvests since 1972, and the take of sea lions by fisheries has been estimated to be small relative to the size of the population. During the period of rapid population decrease during the late 1970s through the 1980s, there were also major shifts in abundance of many marine species in the North Pacific attributed to both climatological events and commercial harvests of fishes. Analysis of these trends has been complicated by the scarcity of baseline population data on the robust sea lion population that existed before 1975, which is needed for comparison with data on the current depleted population. Since there are few avenues for augmenting this historical database (e.g., reanalysis of existing data, testing of archived tissue samples for contaminants and disease agents, reconstruction of environmental events based on isotope anomalies or annual growth patterns), the cause, or causes, of the early phase of the sea lion population decline will likely remain a source of speculation and debate. However, existing information can be used to identify scenarios that could explain the historical decline, which will be valuable in understanding the prospects for recovery of the remaining population.

Under the ESA, federal agencies must ensure that their actions, or actions they authorize, are not likely to jeopardize the survival or recovery of protected species or damage the protected species' critical habitat. Therefore, if a federally regulated activity may affect Steller sea lions, the responsible agency must take actions to ensure that negative impacts are avoided. This requirement has made it imperative to identify human activities that may contribute to the decline of Steller sea lions so that regulatory actions can be adjusted to address threats to the western population's survival. Unlike the biological opinions required by the ESA listing, this report does not assess the statutory basis for regulating the groundfish fisheries.

At least eight plausible hypotheses have been proposed to explain the decline of the sea lion population. These include threats that result from human activities and naturally occurring events that affect sea lion survival. Human activities that may threaten sea lion recovery include direct takes such as illegal shooting and subsistence harvest, and incidental takes through capture or entanglement in fishing gear. Indirectly, commercial fisheries may disrupt feeding patterns, breeding, and other aspects of sea lion behavior. Also, fishing may decrease the carrying capacity of sea lion habitat through the removal of prey species or by shifting the distribution of species such that less nutritious fish dominate the prey base, the so-called junk food hypothesis. Pollution may pose another indirect effect by impairing the health of sea lions and increasing their susceptibility to disease.

But increased mortality of sea lions may not be just a consequence of human activities. There are natural cycles of abundance and decline in marine ecosystems that are driven by climate variability, predator-prey interactions, and invasions by infectious diseases or toxic algal blooms. It is difficult, and often impossible, to resolve the relative contributions of human and natural sources of change, especially since complex interactions among species may cause the combined effects to be significantly different from the effects of any single factor.

In part because of the absence of definitive data confirming or excluding any particular hypothesized cause of decline, the regulatory measures taken in response to the protected status of the western population under the ESA have been particularly contentious. **Resolution of this conflict requires management that not only improves chances for the recovery of Steller sea lions but also facilitates scientific study of the efficacy of these protective measures.**

MAKING THE MOST OF EXISTING INFORMATION

The hypotheses proposed to explain the decline of the western stock fall into two categories. The first category, the bottom-up hypotheses, includes potential causes that would affect the physical condition of sea lions such as:

- large-scale fishery removals that reduce the availability or quality of prey species,
- a climate/regime shift in the late 1970s that changed the abundance or distribution of prey species,
- nonlethal disease that reduced the foraging efficiency of sea lions, and
- pollutants concentrated through the food web that contaminated fish eaten by sea lions, possibly reducing their fecundity or increasing mortality.

The second category, the top-down hypotheses, encompasses factors that kill sea lions independent of the capacity of the environment to support the sea lion population. These include:

- predators such as killer whales (or possibly sharks) that switched their prey preference to sea lions,
- incidental takes of sea lions through capture or entanglement in fishing gear that increased as a result of the expansion of commercial fisheries,
- takes of sea lions in the subsistence harvest that were higher than estimated,
- shootings of sea lions that were underestimated in the past and present, and
- pollution or disease that increased mortality independently of effects on nutrition (e.g., introduction of a contagious pathogen could decimate a population and give the same appearance as an efficient predator).

Observed characteristics of sea lion biology and behavior should be different under these two categories. The bottom-up hypotheses predict increased mortality through reduction in physical condition, manifested by changes in physiology, reproductive success, and foraging behavior. Top-down hypotheses predict no loss of individual fitness but require increased activity by predators, people, or pathogens. Hence, indicators of sea lion health and feeding behavior may be informative in distinguishing the likelihood of these two modes of sustained population decline. It is important to remember that some combination of both types of factors may have contributed to the population decline. For instance, evidence indicating a significant decrease in sea lion physical condition would not exclude the possibility that top-down causes also contributed to overall mortality. Also, geographic variations in environmental conditions across the range of the western population may mean that different factors are to varying degrees responsible for mortality in different parts of the range.

In the existing body of information on Steller sea lions, there is no conclusive evidence supporting either the bottom-up or the top-down hypotheses. Therefore, the available data must be carefully evaluated to ascertain the more plausible causes. First, the evidence can be categorized according to the time period during which it was collected. The rate of decline of the western population has changed since it began in the 1970s. From 1975 to 1985, the annual rate of decline averaged 5.9%. Over the next 5 years the population dropped precipitously, about 15.6% per year. Since the early 1990s (through 2001), the population has continued to decrease but at the more gradual rate of 5.2% annually. The loss of such a large fraction of the population during a relatively short time span (1985-1990) indicates that sea lions were subject to a threat, or threats, that spurred the decline in the 1980s but that by the 1990s these threats either had ended or had less impact.

Second, the evidence can be sorted geographically. In 1995 the National Oceanic and Atmospheric Administration determined that Steller sea lions west of 144° west constituted a distinct population unit based on dispersal patterns, population trends, and genetic differentiation. Because female Steller sea lions tend to return to their natal rookeries for breeding, the western stock may be considered a metapopulation. A metapopulation is a regional population comprised of semi-isolated local populations with limited exchange or interaction, which may fluctuate in response to regional as well as global impacts. Hence, variability in the geographic pattern of decline may point to causes that are specific to particular areas.

Temporal and spatial evaluation of the population data show that the 5-year period of rapid decline (1985-1989) was a range-wide phenomenon and hence was most likely caused by an ecosystem-wide change in the Steller sea lion's environment. Hypotheses that are consistent with this pattern include nutritional limitation through competition with fisheries and changes in prey abundance due to the environmental regime shift in the late 1970s, predators switching from a depleted prey population to sea lions, or introduction of a lethal and highly contagious disease agent such as a virus. Evidence for nutritional limitation includes observations that sea lion condition, growth, and reproductive performance were lower during this time period. However, ecosystem models based on data from the eastern Bering Sea indicate that changes in the relative abundance of prey cannot account for the full magnitude of the decline. Either increased predation or epidemic disease could account for the high mortality rate, but systematic observations of killer whale (or possibly shark) predation were not conducted at that time and serological tests to date have been negative for common pathogens associated with disease epidemics in marine mammals. The large increase in the rate of decline was unlikely to be caused primarily by subsistence harvest, toxic algal blooms, or illegal shooting because these threats tend to vary by geographic location and there is no evidence to suggest that they greatly intensified during this time period. **Multiple factors probably contributed to the widespread population decline in the 1980s, including incidental and deliberate mortality associated with fishing activities, but elucidation of the complete spectrum of causes and consequences is unlikely because of gaps in the available data.**

The pattern of decline has changed since the early 1990s. Not only has the overall rate of decline decreased, but individual rookeries show different population trends as well. Over the past decade, the majority have continued to decline, some have stayed at the same level, and a few have shown modest increases. Based on the most recent census of trend sites, counts of adults and juveniles in 2002 show a 13.6% increase in the Gulf of Alaska and less than a 1% decrease in the Aleutian Islands relative to the 2000 census. However, it would be premature to conclude that the Gulf of Alaska population is recovering based on counts from a single year. The predominant cause of decline may have changed between the 1980s and 1990s. It is possible that minor factors during the 1980s have a larger relative impact now because the remaining population is much smaller. Observations made at one site may not apply to other areas or even to nearby rookeries. Research will be required at multiple sites to resolve whether survival is threatened by local, regional, or population-wide causes. **Finer-scale spatial analysis of Steller sea lion populations and environmental conditions will be required to uncover potential region-specific determinants that are affecting sea lion survival.**

The more recent period of decline (1990-present) is the primary concern of this report because of the need to provide scientific advice for the design of management actions that do not jeopardize the continued survival of the western Steller sea lion population. Although limited in sample size, geographic range, and seasonality, recent measurements of sea lion condition and foraging activity indicate that the western stock is not nutritionally stressed and that individuals are not spending a disproportionate amount of time or energy in locating prey. Analysis of scat components provides evidence that dietary diversity is lower in the western range than in the eastern range, but this may represent opportunistic feeding patterns rather than a decrease in availability of preferred prey species. Additionally, the levels of groundfish biomass during the 1990s were large relative to the reduced numbers of sea lions, suggesting that there has been no overall decrease in prey available to sea lions, although it is still possible that localized depletion of some fish species may affect particular rookeries. **Existing data on the more recent period of decline (1990-present) with regard to the bottom-up and top-down hypotheses indicate that bottom-up hypotheses invoking nutritional stress are unlikely to represent the primary threat to recovery.**

Because the preponderance of evidence gathered during the current phase of the decline runs counter to expectations based on bottom-up hypotheses, the committee gave serious consideration to each of the top-down (direct mortality) hypotheses. All four hypotheses in the top-down category identify sources of mortality applicable to both the earlier and the current phases of the decline. What has changed since the 1980s is the potential impact of this mortality on the much smaller remaining population. Although killer whale predation may have had a significant impact on the historical population, continued predation, as well as illegal shooting, incidental takes by fishing gear, and subsistence harvests may have had a proportionately larger impact on the current depleted sea lion population. In the absence of other significant changes in the ecosystem, the intensity of bottom-up threats is expected to decrease as the sea lion population decreases, but top-down threats are often less dependent on population size. Sea lions remain easy targets for humans and marine predators because they congregate at rookeries and haulouts at certain times of the year. Similarly, sea lions may continue to get ensnared by fishing gear because of the ample banquet of food available around fishing operations. Attraction of killer whales to these same fishing vessels could increase the vulnerability of sea lions to predation. Identifying the most likely top-down hypothesis may depend on matching the different threats to the spatial patterns of sea lion population decline. Different hypotheses may apply to some but not all parts of the large geographic range of the western population. **Although no hypothesis can be excluded based on existing data, top-down sources of mortality appear to pose the greatest threat to the current population. Investigations of**

top-down sources of Steller sea lion mortality should be increased to evaluate the proportionate impact of these factors on the population decline.

MONITORING TO EVALUATE MANAGEMENT EFFICACY

Although most evidence indicates that groundfish fisheries are not causing a range-wide depletion of food resources necessary to sustain the current western population of sea lions, there is insufficient evidence to fully exclude fisheries as a contributing factor to the continuing decline. In some areas, fisheries may compete with sea lions for localized fish stocks, increase incidental mortality due to gear entanglement and associated injuries, disturb animals on haulouts, increase exposure to natural predators through attraction to fish catches, and provide motivation for continued illegal shooting of animals to mitigate lost catches and damaged fishing gear. Moreover, fisheries are one of the few human influences on the Steller sea lion's environment and hence are subject to regulation under the ESA. Therefore, restriction of fishing operations in sea lion habitat remains a reasonable response to the continuing decline of the endangered western population.

The committee has identified five general management options that might be taken to address the potential impacts of groundfish fisheries on sea lions and recommends monitoring priorities to assess the efficacy of each option. These options are evaluated with regard to their scientific potential for discerning the role of groundfish fisheries in the Steller sea lion decline. Each of these options would require continuation of the existing monitoring program (i.e., continued census of trend sites and collection of demographic data based on pup branding and resighting). The committee made the assumption that it is possible to craft each option so as to satisfy the requirements of the ESA. The five options are presented below.

1. *Wait and see, maintaining current closures indefinitely.* Recent management actions, including area closures, may be sufficient to reverse or reduce the rate of population decline. **Under this option the most valuable monitoring information would be derived from annual reference rookery and haulout counts and new demographic data from branded pups.**
2. *Eliminate direct fishery impacts with greatly expanded closures.* This would require closing the Atka mackerel fishery in the Aleutians and reducing the main pollock fishing areas in the southern half of the eastern Bering Sea. **Under this option, monitoring of fish population dynamics, both locally and at the stock level, would be required to determine the effects of the fisheries on stock distribution and fish community composition.**
3. *Establish spatial management units consisting of two sets of closed and open areas where each treatment area is centered on a rookery.* The western population would be divided into management regions with at least two closed and two open rookeries per region. Because most monitoring activities are conducted at rookeries (pup counts, measurement of vital rates, juvenile tagging, etc.), it makes the most sense to use rookeries (rather than rookeries and haulouts) as the experimental units. Also, sea lions are thought to be more vulnerable near rookeries because of the age composition (presence of pups and juveniles) and because females must forage near the rookeries so that they can easily return to nurse their pups. The closed treatment units would be subject to fishery closures,

and the open units would have sea lion-related fishery restrictions removed. **Under this option, the most critical monitoring needs would be detailed local Steller sea lion censuses and spatial analyses of fish population changes for each experimental unit in the overall design.**

4. *Implement a "titration experiment" where restrictions on fisheries (such as area closures) are increased progressively over time until a positive response is achieved.* This option is a variation on the strategy used during the 1990s. Fishery regulations continue to become more restrictive as long as the sea lion population continues to decline. **This approach requires monitoring of sea lion population trends, but results could be confounded by the lack of baseline data and natural environmental variability.**

5. *Micromonitor and manage localized interactions between sea lions and fisheries to reduce mortality where and when it occurs in the future.* **This option would require expansion of all basic monitoring activities (abundance, prey fields, mortality agent distribution) around key rookeries to pinpoint times and places of increased mortality so that appropriate management measures could be taken.** The expense of this program would be high because of a requirement for year-round continuous monitoring to allow detection of mortality events in all seasons and locations.

To resolve questions about the impact of the fisheries on Steller sea lion survival, the preferred option is #3 because it is the only approach that directly tests the role of fishing in the decline. Option #3 provides the benefits of an adaptive management experiment, reducing the possibility that regulation of the fishing industry is perpetuated without demonstrable benefit to the Steller sea lion population. Not only does the removal of all sea lion-related fishing restrictions in open areas create opportunities for the industry, it provides a contrasting management treatment necessary for a valid experimental comparison with closed areas. A careful evaluation of past fishing effort in the proposed experimental areas will be required to assess the amount of displaced fishing effort. Placement of open areas where fishing effort has historically been high would decrease the potential for negative impacts arising from shifting effort from the closed to the open areas.

Option #3 provides the setting necessary to carry out research studies on Steller sea lion behavior and performance in contrasting environments while controlling for common effects such as large-scale change in oceanographic regimes. This approach acknowledges that there is no best or precautionary policy because the origin of the decline is unknown. Hence, every segment of the population has an uncertain future with or without new restrictions on the fisheries. Multiple sites in various locations must be included in the experiment to control for site-specific variations in threats to the population. If there are multiple causal factors, such as food, predation, or fishing-related mortality, replication is critical to guard against incorrectly applying the results from any single treatment/control comparison to areas where the results would not apply.

Experimental treatment is a policy option that improves management and increases understanding of the interactions between fisheries and sea lions. Open areas restore opportunities for fisheries by removing restrictions; closed areas remove any potentially negative local impacts of fisheries on sea lions.

Although the incremental approach may be easier to implement, it contains two serious shortcomings. First, it cannot account for ecosystem change due to factors such as oceanographic regime changes. Hence, the efficacy of new management restrictions would not be distinguishable from environmental change that occurs on decadal timescales, confounding either positive or negative outcomes. Second, a false positive outcome would commit managers to prolong additional fishery restrictions without realizing significant improvement in the survival of Steller sea lions.

Listed below are several guidelines for implementing the spatial management units described under option #3:

- *Fished area (under normal management plans).* Design closures to minimize the displacement of fisheries to more distant, and less safe areas. The groundfish fisheries have been the focus of restrictions to protect sea lions based in part on the large amount of biomass removed, but the potential effects of other fisheries have not been as thoroughly examined. Hence, there are two basic experimental treatment options for area closures: (1) closure to groundfish fisheries only or (2) closure to all fishing. A positive response to the first treatment would measure the impact of the groundfish fisheries separately from the effects of other fisheries. A positive response to the second treatment would implicate fishing activities, but there would be uncertainty as to whether the response was due to exclusion of the groundfish fisheries or exclusion of another fishery—for example, herring or salmon. Closure of these areas to all fishing activity would provide the greatest contrast with the open areas for assessment of fishery-related effects on Steller sea lions. If only the groundfish fisheries are excluded from the closed areas, logbook data and as much observer coverage as possible should be obtained for other fisheries. Strict enforcement would be essential for correct interpretation of the effects of the closures.

- *Size and number of treatment areas.* The size of the closed areas depends on both fish movements and sea lion movements. The radius of the closure might range from 20 to 50 nautical miles (centered on a rookery). Replicates of each open/closed area comparison site will be required to assess the effects of environmental variability.

- *Timescale.* Some data gaps can be filled in less than 5 years (evidence of disease, localized fish depletion, improved estimates of direct mortality sources), but long-term monitoring (5 to 10 years) will be required to assess recruitment and mortality rates. If substantial numbers of Steller sea lions are taken as bycatch, open areas should be closed or fishing gears modified to prevent further decline of the population. This should apply to all fisheries that take sea lions as bycatch.

RECOMMENDATIONS FOR RESEARCH AND MONITORING

Research and monitoring should be directed toward measuring the vital rates and response variables most indicative of the status of the Steller sea lion population. This should include:

- *Population trends*. The current program for monitoring the juvenile and adult populations by aerial survey should be continued along with direct pup counts at selected rookeries.

- *Vital rates.* Vital rates have not been measured since the mid-1980s and urgently require updating. This should include measurements of fecundity, age at first reproduction, age distribution, juvenile survival, adult survival, and growth rates. Cooperative programs with subsistence hunters could provide reproductive data without additional mortality. Other parameters may be measured through increased effort in branding and resighting programs, requiring a commitment of resources for a period of time equivalent to the lifespan of the Steller sea lion.

- *Critical habitat.* Although the rookeries and haulouts of sea lions have been cataloged and described, the at-sea distribution of sea lions and related foraging activity are less well documented. Mostly this reflects the difficulty of collecting such data. The most valuable information comes from telemetry data, but analysis is constrained by the relatively small number of animals tagged, biases inherent in the recovery of data, and inaccuracies from inferring foraging activity based on swimming and diving behavior. Stomach telemetry tags that monitor temperature shifts associated with ingestion of prey should improve correlations of at-sea distribution with feeding. In conjunction with the analysis of Steller sea lion's at-sea activities, the activity and impacts of fisheries should be documented. Studies should be undertaken to determine if fisheries cause localized depletion of the various groundfish stocks through monitoring of fish distribution and density during the course of the fishing season with consideration of the need to distinguish these effects from natural changes in abundance. Designation of critical habitat should be revisited based on the results of the research proposed above.

- *Environmental monitoring.* Assessment of various ecological features of the sea lion environment will provide a broader context for evaluating sea lion population trends. These should include assessments of oceanographic conditions, plankton composition, forage fish abundance and distribution, seasonal migrations by groundfish, cephalopod abundance and distribution, and arrowtooth flounder interactions with groundfish (competition and predation). Also, monitoring for harmful algal bloom frequency and distribution through sampling of coastal waters will be valuable for assessing sudden mortality events. Biological sampling of sea lions should include testing for known marine mammal disease agents.

- *Predator feeding habits and population size.* Much more information is necessary to evaluate the impact of predation by killer whales and sharks on the continuing decline of the western population. Current evidence suggests that sharks are unlikely to be a major source of mortality based on distribution, limited diet data, and the relatively infrequent observations of shark wounds on sea lions. Better estimates of killer whale diet, population size, and distribution (including patterns of movement and habitat use) throughout Alaska are required to estimate potential predation mortality. In addition, observer programs should be instituted to record killer whale feeding behavior that may be different in different regions. Salmon shark and sleeper shark bycatch data from longline fisheries should be collected to assess shark abundance, and shark stomach contents should be examined to determine whether sea lions are a significant component of sharks' diets.

Most studies of Steller sea lions have been conducted in the summer, when sea conditions are favorable and it is relatively easy to work with females and pups on rookeries. However, this introduces a strong bias into the results because this season may not be the time when Steller sea lions are subject to increased mortality. The fate of juveniles remains a potentially pivotal question justifying the recent emphasis on their capture and tagging. In addition to increasing efforts directed toward year-round research at more accessible sites, remote observation methods such as satellite telemetry and video monitoring at rookeries and haulouts will be necessary to assess seasonal activity patterns. Although some research programs will yield data in a relatively short time (1 to 5 years), many of the variables most critical to assessing the efficacy of the various management regimes will take a minimum of 5 to 10 years before conclusive results are available. This is a consequence of the biology of sea lions; their long generation time means a slow population response and increased time required for assessing vital rates. Hence, it is even more urgent to develop and implement a prioritized cohesive research plan to address these information needs. Under an adaptive management scheme, the requirement to reduce jeopardy can be effectively coupled with a rigorous research program to reduce uncertainty about the causes of the ongoing decline of the Steller sea lion population.

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

March 13, 2003

RECEIVED
MAR 24 2003
N.P.F.M.C

David Benton, Chairman
North Pacific Fishery Management Council
605 W. 4th Avenue
Anchorage, AK 99501-2252

Dear Mr. Benton,

At its October 8, 2002, meeting, the Council adopted a motion (attached) for a "work plan" to assess the potential effects of an Aleutian Islands (AI) pollock fishery outside of Steller sea lion critical habitat (CH), as currently authorized under Steller sea lion (SSL) protection measures. The Council acknowledged that the AI pollock fishery has been closed since 1999 under the annual harvest specifications to address pollock resource and fishery management concerns. It also expressed concern about the continued potential for a fishery outside CH under SSL protection measures and whether the authorization of this fishery was prudent without further review of the effects of the fishery on SSLs, on other fisheries, as well as potential cumulative impacts of a pollock fishery on other components of the AI biological ecosystem. The Council requested that a report on these issues be provided for Council consideration at its April 2003 meeting.

The Council assumed that NMFS would take the lead on this assessment, which largely is appropriate given the nature of the questions being asked. As we informed the Council at its February 2003 meeting, other staff workload priorities conflicted with the Council's expectation for NMFS staff to develop a separate analysis that responds specifically to the Council's October 2002 motion. We continue to support the premises of the 2001 biological opinion with respect to actions necessary to protect SSLs and the determination that fishing activities conducted under the SSL protection measures are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. We are continuing to evaluate the effect of fishing activities on endangered SSLs in response to the December 30, 2002, court order concerning the 2001 BiOp and the associated remand that requires NMFS to provide additional information by June 30, 2003.

The work undertaken by NMFS, as part of the remand, will partially address the Council's motion and will reiterate that pollock closures in the Aleutian Islands beyond critical habitat are not an integral part of the conservation strategy for SSLs. In the draft section 7 consultation on the Steller sea lion conservation measures (August 2001) which was reviewed by the Council, NMFS determined that a pollock fishery outside of critical habitat would not jeopardize the continued existence of the species and would not destroy or adversely modify its critical habitat. Conversely, closures for AI pollock within critical habitat and seasonal distribution of catch are consistent with the overall management strategy for SSL protection measures. Thus, our initial review is that the opening of an AI pollock fishery outside of critical habitat (under the AFA and with a seasonal apportionment of 40/60) would not require re-consultation under section 7 of the ESA, because the action of having a pollock fishery beyond critical habitat has already been considered (2001 BiOp). Additionally, the area beyond critical habitat lies almost entirely off the continental shelf break, and the probability of adverse effects on the population are unlikely.

Moving beyond the 2001 BiOp and associated remand, we anticipate reinitiating consultation on the effects of fishing activities on SSLs and other listed species within the next year. The agency will need to consult on the programmatic supplemental environmental impact statement (PSEIS) that currently is being developed. We anticipate that this would be a new FMP level BiOp based on the Council's preferred alternative and will be a significant undertaking. In addition to the ESA-focused assessment of a new FMP level BiOp, other components of the PSEIS analysis would assess broader ecosystem and fishery related impacts. For example, Alternative 2.1 of the PSEIS (which sets TAC=OFL, and OY cap=sum of OFL) examines the impacts of reopening the AI pollock fishery. The scope of this alternative is broad and results of the analysis of impacts would have to be carefully interpreted with respect to the AI pollock fishery alone, but the analysis should provide additional insight into the ecosystem and fishery effects of an AI pollock fishery.

Additional consultations and analyses in the near future also could be responsive to the Council's request to more fully assess the effects of an AI pollock fishery. For example, the Council's response to the National Academy of Sciences Report on the decline of SSLs could result in the investigation of control areas in the North Pacific, including consideration of an Aleutian Islands closure to fishing for pollock, Pacific cod and Atka mackerel at an appropriate scale. Control areas also may be an effective response to Essential Fish Habitat (EFH) concerns currently under investigation.

Although results of new and ongoing research related to SSL issues is anticipated, no information received to date would cause us to reinitiate consultation on the BSAI and GOA fisheries. Nonetheless, we will be continually evaluating new information to determine if it is sufficiently significant to trigger consultation. Similarly, any new management action under Council consideration that potentially may adversely affect Steller sea lions would trigger consultation and will be reviewed on a case by case basis as required by the ESA.

In summary, we believe that the intent of the Council's October 2002 motion to reassess the impacts of a potential AI pollock fishery outside critical habitat is being addressed by a number of agency initiatives. These initiatives include the remand process on the 2001 BiOp, PSEIS analyses of alternatives and consultation on the Council's preferred alternative, and ongoing evaluation of new information relative to the impacts to listed species under the ESA.

Sincerely,

James W. Balsiger
Administrator, Alaska Region

Attachment

Work Plan for Aleutian Islands Pollock Trawl Closure Under C-2, Steller Sea Lion Measures

October 8, 2002

In April 2002, the SSC recommended modifications to the Steller sea lion (SSL) trailing amendments to address certain deficiencies prior to the document going out for public review. In particular, the request was to provide a historical perspective as to why the Aleutian Islands pollock fishery was originally closed, and what has changed since that time that would warrant reopening.

The SSC in their October 2002 meeting cautioned that it was too soon to conclude that the western population of SSLs was recovering, and that the pup counts in this area continue to decline in the 2002 SSL population survey.

The Aleutian Islands pollock fishery has been closed for the past four years. Reopening the fishery under the proposed SSL measures will result in markedly different spatial and temporal fishing patterns in the Aleutian Islands fishery. A comprehensive review of the effects of reopening the fishery needs to be done prior to authorizing the new fishery.

This review should build on the recent Environmental Assessment developed by staff, and should include a description of: the current SSL stock structure within the Aleutian Islands; a consideration of the current theory and information regarding localized fishery depletions and SSL prey densities; the importance of such prey densities and forage availability to weaned pups and nursing females; the most current telemetry information on weaned pups and foraging outside of critical habitat in the Aleutian Islands; and the cumulative effects on these SSL age classes resulting from multiple fisheries on SSL prey in the Aleutian Islands (Atka mackerel, Pacific cod and Pollock).

In addition, the review should include an analysis of cumulative impacts arising from re-opening the Aleutian Islands pollock fishery on bycatch of target and non-target species, forage fish or other prey of SSLs, and potential impacts on other fisheries. This should include such issues as changes in fishing patterns in the other Aleutian Islands fisheries which have come about during the period of the pollock closure, any changes in spatial and temporal distribution in the pollock fishery arising from proposed SSL measures, and any impacts which might affect participants in other fisheries in the region as a result from reopening the pollock fisheries.

This report should be provided to the Council for consideration at the April 2003 meeting.

AGENDA C-3
APRIL 2003
Supplemental

F/V OCEAN BAY MATTHEW R. HEGGE POBOX 3388 KODIAK, AK 99615

RECEIVED
MAR 26 2003
N.P.F.M.C

25 March, 2003

Re: Central Gulf of Alaska Pacific Cod

Attn: Mr. Dave Benton, Chairman, NPFMC

I am writing with concern over how the Central Gulf Pacific cod TAC has been managed since the 2001 season, when Sealion measures were implemented.

My main concern is the taking of fish between the A and B seasons. The amount of fish taken as bycatch between seasons has gone unchecked and has risen to levels well above what has been historically been taken as bycatch in other trawl fisheries. Through lack of any management to prevent this, there is a direct allocation advantage that is being exploited by trawlers targeting other species. Measures were to be taken to prevent any sector advantage caused by the Sealion measures, this has not happened in this case. As a result, quota that has historically been harvested by vessels of all gear types in the directed Pacific cod is being taken by vessels in bycatch fisheries. The lack of action on this issue could jeopardize the entire Pacific cod fishery, because the A season portion harvest levels set through Sealion measures are being exceeded.

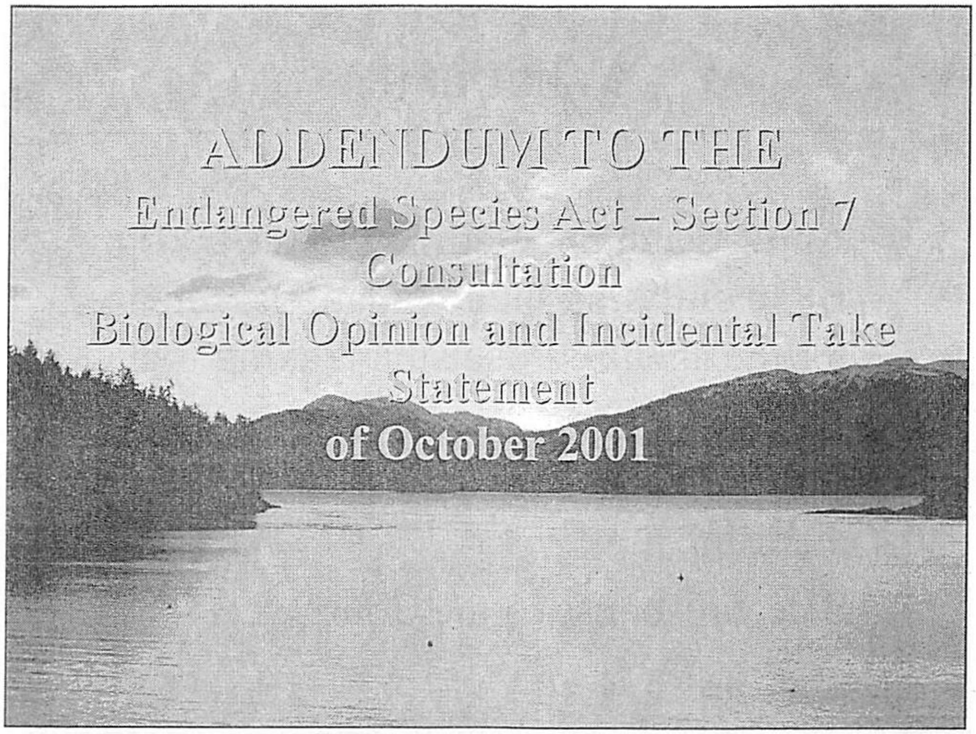
Please consider a cap on bycatch fisheries that reflect historic harvest levels. I appreciate your attention regarding this matter of concern to many fishermen who rely on the Pacific cod directed fishery.

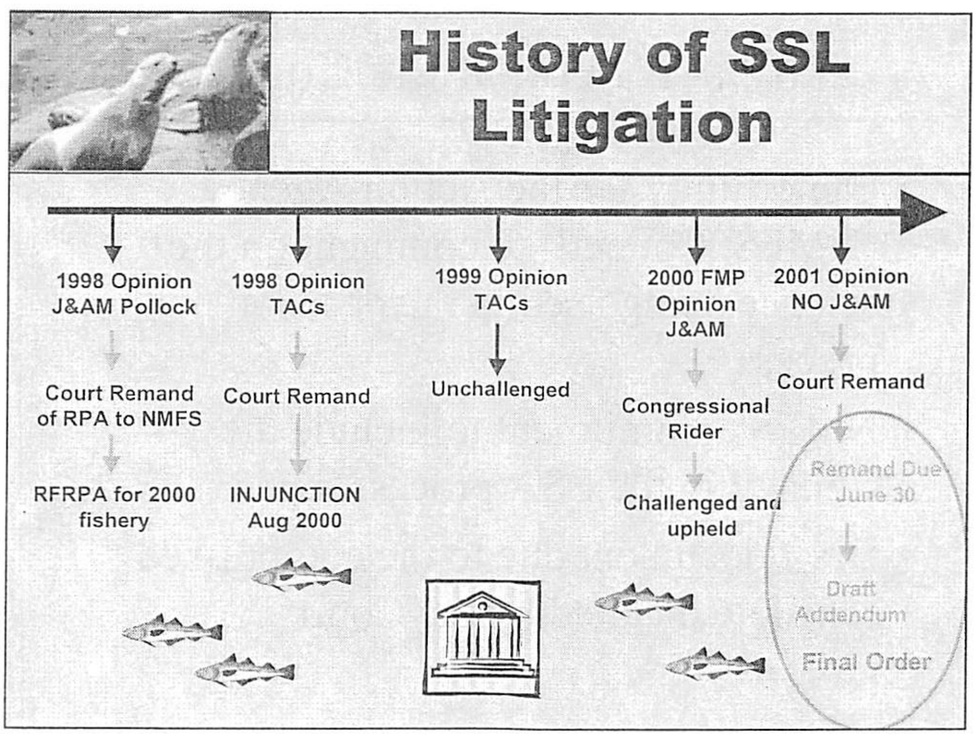
Regards,

Matthew R Hegge

Matthew R. Hegge
F/V Ocean Bay

Shane Capron
C-3





What is it?

- An Addendum – addition to the 2001 BiOp outlining the foundations, science, for the agency's decision making for JAM
- Narrow focus only on issues required by the Court
- Direct response to the Court

Why is it here, at the Council?

- Opportunity for the Action Agency (NMFS, Council) to comment on the science being used in the decision making process
- NMFS commitment to include the Council in the ESA process, open
- Draft document due to the compressed schedule dictated by the Court

What is PR looking for from the Council?

- Comments: such as, information we may have overlooked, interpretations of the data, information that may be erroneous
- Opportunity for the industry and public to view the draft and provide supplemental information which might be valuable – comments due by April 18
- A better working relationship

Balsiger memo outlines the response objectives

1. **The factual basis in telemetry data (and in new data) for the relative weighting of importance of critical habitat zones;**
2. **A comparison of the 1999 "jeopardy" fishery pattern analyzed in the FMP Biological Opinion (BiOp) and the fishery pattern under the revised Steller sea lion protection measures.**

- **(1) addresses the levels of fishery removals in the zones of critical habitat and in critical habitat overall, and the effect of these removals on seasonal prey availability to Steller sea lions of pollock, Pacific cod, and Atka mackerel in critical habitat,**
- **(2) addresses the so-called "edge effect" of fishing in offshore critical habitat (i.e., the 10-20 nm zone) on nearshore critical habitat and the sea lions that forage there, and**
- **(3) an explanation of why the revised Steller sea lion protection measures relieve the impacts that caused jeopardy and adverse modification of critical habitat.**

Page 1-2

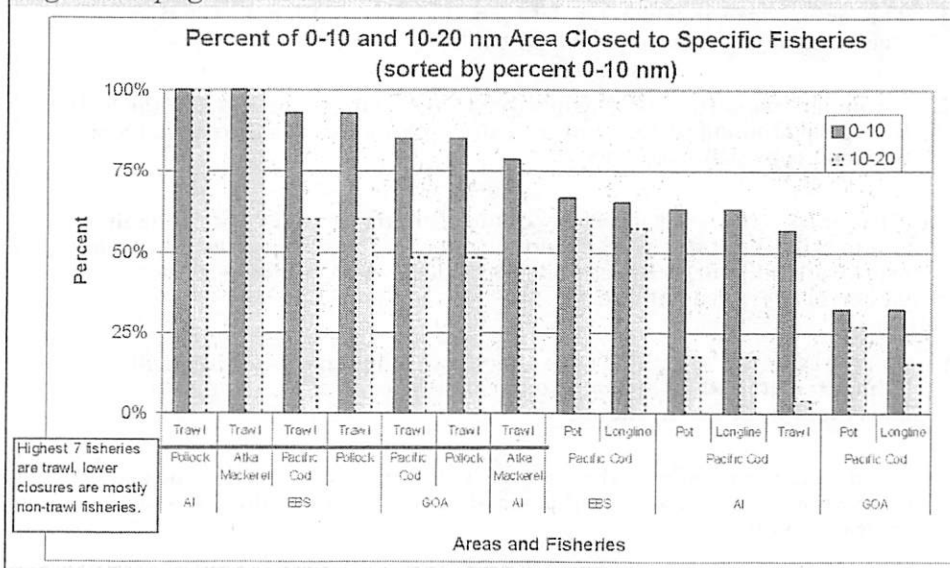
Area closed by conservation measures

Table I-11 page 56

			% Area Closed					
Region	Fishery	Gear	0-3	3-10	*[0-10]*	10-20	Foraging Area	Total CH
AI	Pollock	Trawl	100%	100%	*100%*	100%	100%	100%
	Pacific Cod	Trawl	100%	51%	*57%*	4%	100%	25%
		Pot	100%	58%	*63%*	18%	100%	36%
		Longline	100%	58%	*63%*	18%	100%	36%
	Atka Mackerel	Trawl	100%	75%	*78%*	45%	100%	58%
EBS	Pollock	Trawl	100%	92%	*93%*	60%	45%	58%
	Pacific Cod	Trawl	100%	92%	*93%*	60%	45%	58%
		Pot	100%	63%	*67%*	60%	45%	54%
		Longline	100%	61%	*65%*	57%	44%	52%
	Atka Mackerel	Trawl	100%	100%	*100%*	100%	45%	73%
GOA	Pollock	Trawl	100%	83%	*85%*	48%	0%	57%
	Pacific Cod	Trawl	100%	83%	*85%*	48%	0%	57%
		Pot	58%	29%	*32%*	27%	0%	27%
		Longline	58%	29%	*32%*	16%	0%	20%

Area closed 0-10 and 10-20 nm

Figure I-7 page 80



Section II
Q1: Telemetry and its use to define areas of importance for SSLs

- Section II(A) and (B) provide historical background of telemetry information and the use inBiOps
- Section II(C) is a new analysis by NMML focusing on juvenile diving behavior– unpublished data
- Section II(D) is a summary of the basis for the ratings for each zone

Revised Table 5.1 from 2001 BiOp

Table II-1 page 58

Adults

"Table 5.1a" from 2001 BiOp unfiltered adults	Summer (Apr–Sept)	Winter (Oct–Mar)
Zone	Adults (*n=201*)	Adults (*n=96*)
0-10 nm	95.6 %	79.2 %
10-20 nm	0 %	4.2 %
beyond 20 nm	4.5 %	16.7 %

Juveniles

"Table 5.1a" from 2001 BiOp unfiltered pups and juveniles	Summer (Apr–Sept)	Winter (Oct–Mar)
Zone	YOY/Juveniles (*n=274*)	YOY/Juveniles (*n=1062*)
0-10 nm	74.4 %	99.1 %
10-20 nm	5.1 %	0.6 %
beyond 20 nm	20.4 %	0.4 %

Review of Published Telemetry data

Juveniles	*mean*	*sd*
≤10 mo[1]	3.8	10.3
≥10 mo[1]	13.3	30.9

Tables II-3,4,5 page 59

Age group	Distance Mean	sd	Median	Range	Trips (n)	Animals (n)
Juveniles						
≤10 mo[1]	3.8	10.3	1.5	0.05-141	257	13
≥10 mo[1]	13.3	30.9	13.3	≤0.5-242	307	15
Adult female[2]						
summer	9.2	5.5		2-26	30	5
winter	71.8	72.4		3-293	30	5
winter, with pups	29					2

[1] Loughlin et al. (2003)
[2] Merrick and Loughlin (1997) and Merrick (1995)
[3] Subset of 5 animals with winter attachments

New Juvenile Telemetry Analysis

- Section II(C)
- 63 Juvenile SSLs from 2000-2002
- 10,006 total locations
- Filtered out locations not associated with dives (4m depth limit)
- Appendix I contains the data set

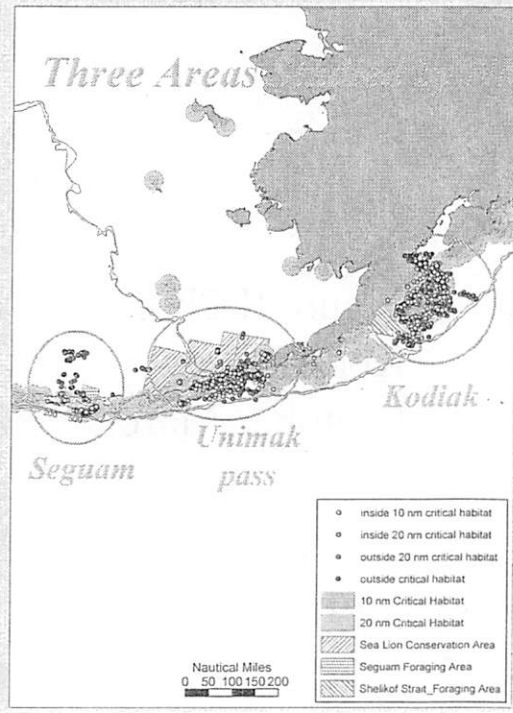


Figure II-1 page 81 Locations associated with dives to greater than 4 meters recorded for 63 juvenile Steller sea lions in 2000-2002

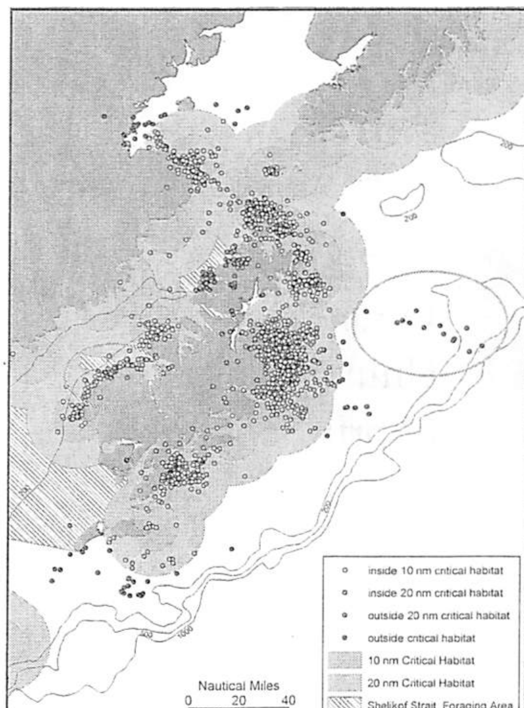


Figure II-2a Kodiak (April-September)

Yellow = <10 nm

Green = <20 nm

Red = >20 nm

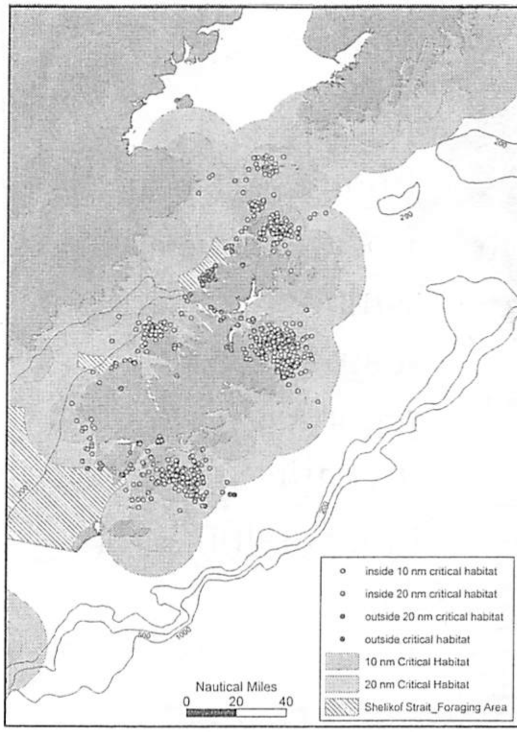


Figure II-2b.
Kodiak
(October-March)

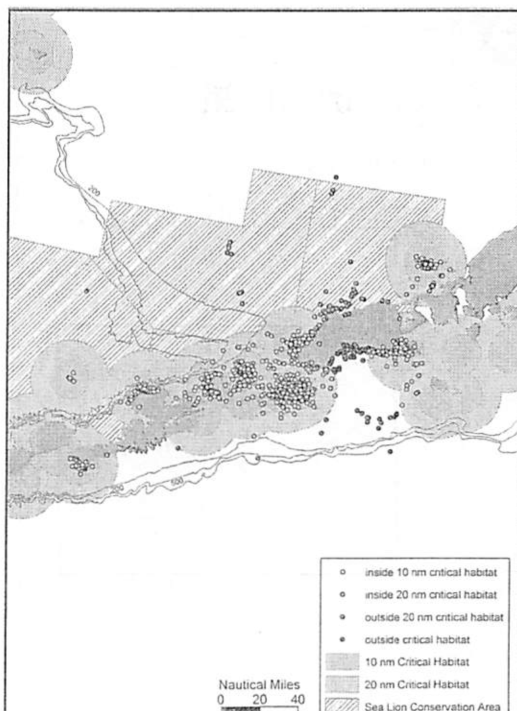


Figure II-3a
Unimak Pass
(April-September)

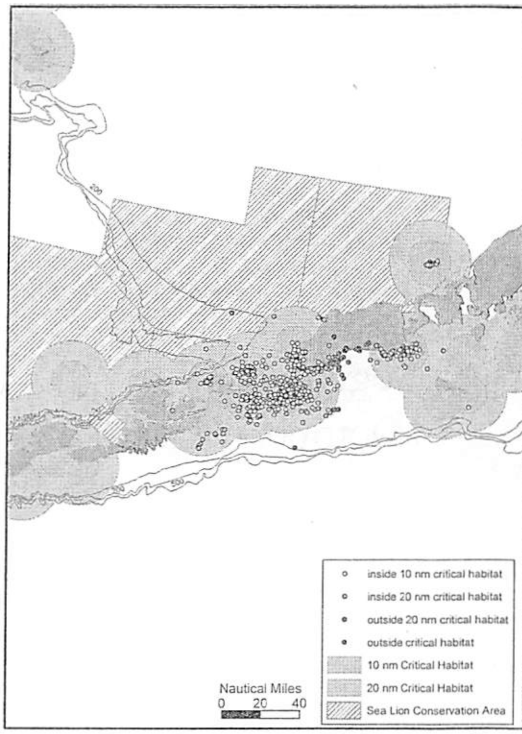


Figure II-3b.
Unimak Pass
(October-March)

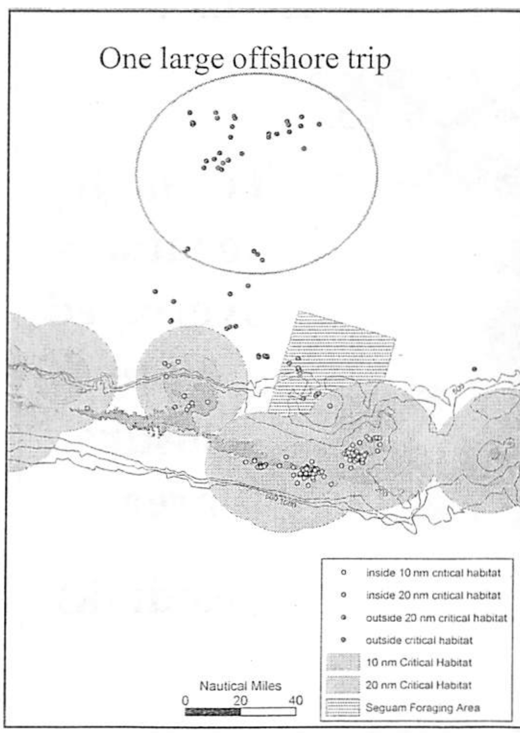


Figure II-4a.
Seguam
(April-September)

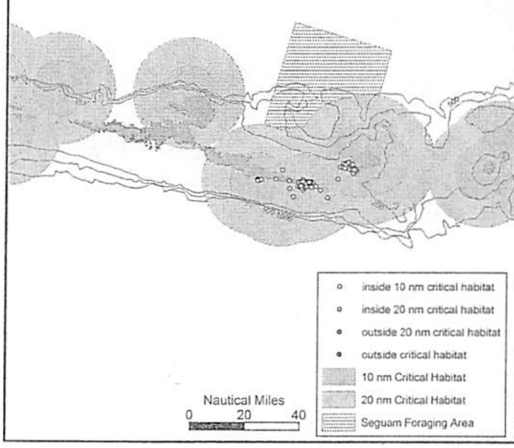
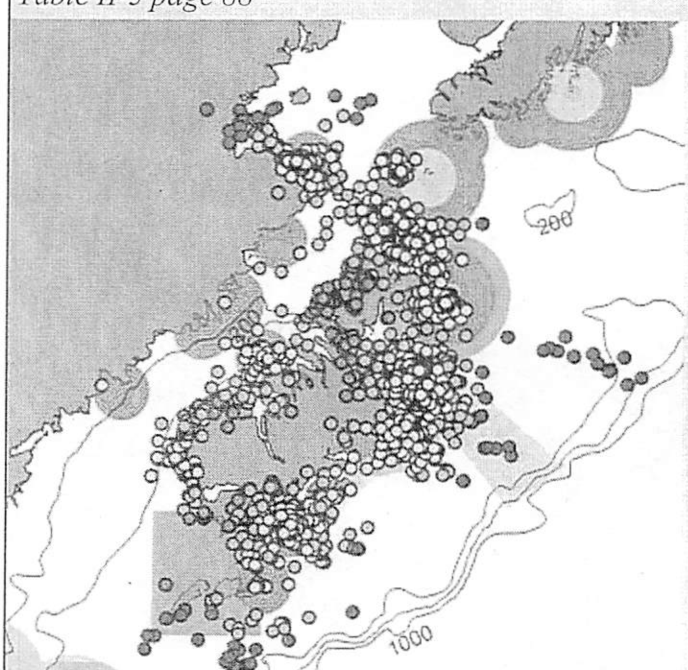


Figure II-4b
Seguam
(October-March)

Table II-5 page 88

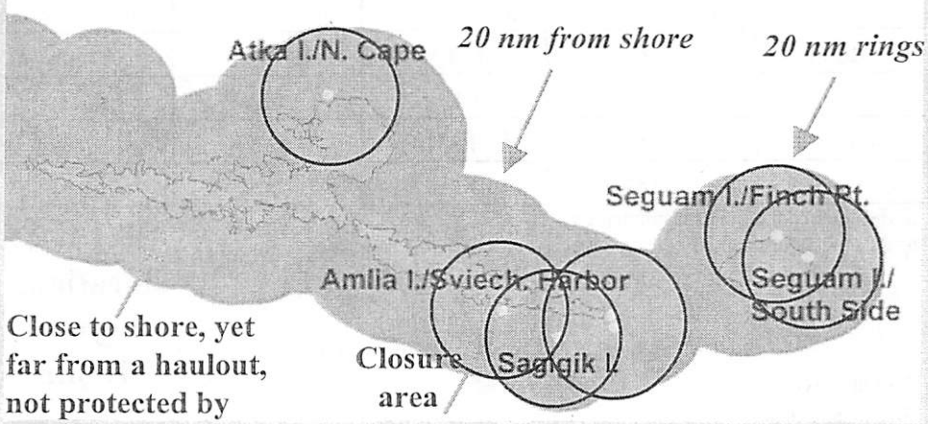


Telemetry locations overlayed with closure areas

(Kodiak)

Land vs. Listed Site

Figure II-6 page 89



Haulout   Land

Table II-6 p. 59.5

Zone	Distance from listed rookery or haulout site		Distance from any point of land	
	Summer (Apr–Sept) (n[1] =6,470)	Winter (Oct–Mar) (n=3,536)	Summer (Apr–Sept) (n=6,470)	Winter (Oct–Mar) (n=3,536)
0-10 nm	88.9%	90.3%	96.6%	98.4%
10-20 nm	5.8%	7.0%	1.4%	1.5%
>20 nm in CH	2.4%	1.7%	2.0% [2]	0.2% [2]
Outside CH	2.9%	1.0%		

[1] n=the number of telemetry locations received from all the animals.
[2] Indicates area beyond 20 nm, including areas beyond critical habitat

- Chose to use distance from a listed rookery or haulout, matches conservation measures
- Dependence upon nearshore areas as previous analyses have shown

Is the Age of a Juvenile Important?

Table II-7 p. 59.5

	Summer (Apr–Sept)		Winter (Oct–Mar)	
Zone	0-10 Months (n[1] =41,n[2] =2920)	>10 Months (n=46, n=3550)	0-10 Months (n=45, n=2950)	>10 Months (n=8, n=586)
0-10 nm	91.0 %	87.1 %	94.7 %	67.9 %
10-20 nm	4.7 %	6.8 %	3.9 %	22.4 %
>20 nm in CH	1.6 %	3.0 %	0.5 %	7.7 %
Outside CH	2.8 %	3.1 %	0.8 %	2.0 %

[1] n=the number of animals instrumented.
[2] n=the number of telemetry locations received from all the animals.

30.1% of locations beyond 10 nm

Page 16

Number of Animals

	Summer (Apr-Sep)	Winter (Oct-Mar)
11-12 months of age	30 *YOY*	0
13-18 months of age	7	3
19-24 months of age	4	5
> 2 years old	5	0

"True juvenile"

Response to question 1:

Level of concern remains the same with low to moderate inside 10-20 based on usage by juvenile sea lions and adults

Table II-9 p. 60

	Level of Concern	Summer (Apr-Sept)	Winter (Oct–Mar)
Zone	2001 BiOp	>10 Months (n=46, h=3,550)	>10 Months (n=8, h=586)
0-10 nm	High	87.1 %	67.9 %
10-20 nm	Low to moderate	6.8 %	22.4 %
>20 nm in CH	Low	3.0 %	7.7 %
Outside CH	Low	3.1 %	2.0 %

Section III
Impacts to the SSL Prey Field

Reviewed the 7 questions from the FMP BiOp

1. **Fisheries which overlap spatially with the area used by Steller sea lions to forage on pollock, Pacific cod, and Atka mackerel,**
2. **Fisheries which overlap temporally with Steller sea lions foraging for pollock, Pacific cod, and Atka mackerel, and**
3. **Fisheries which operate in a spatially or temporally compressed manner in Steller sea lion foraging habitat (localized depletions).**

GOA Gear	Year	Change from 1999 to 2002 as % 3-10	10-20	Total CH
Pollock Trawl	1999 2002	-24%	-20%	-34%
Cod Trawl	1999 2002	-7%	12%	3%
Cod Pot	1999 2002	-13%	127%	31%
Cod H&L	1999 2002	-32%	-41%	-30%

BSAI Gear	Year	Change from 1999 to 2002 as % 3-10	10-20	Total CH
Pollock Trawl	1999 2002	560%	255%	49%
Cod Trawl	1999 2002	-46%	25%	0%
Mackerel Trawl	1999 2002	-77%	11%	-12%
Cod Pot	1999 2002	-4%	-25%	-18%
Cod H&L	1999 2002	-75%	-41%	-34%

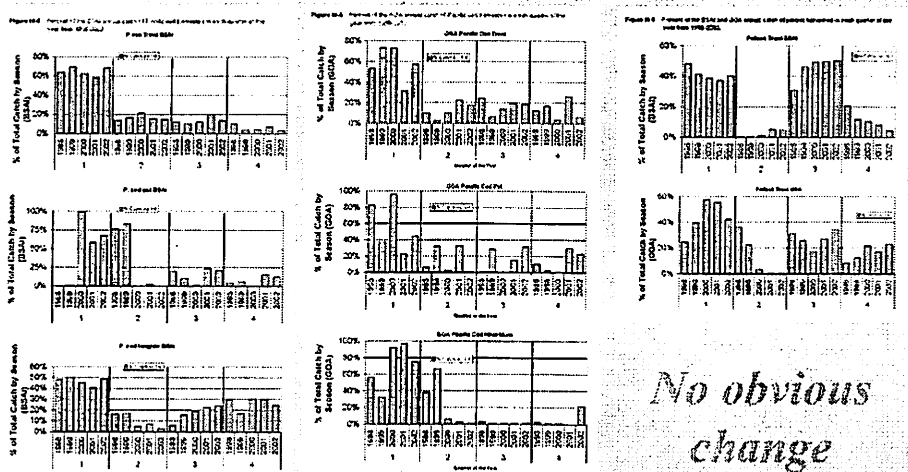
BSAI and GOA	Year	Change from 1999 to 2002 as %		
ALL GEAR	1999 2002	-49.1	45.8	22.2

Table III-4
p. 64

Spatial Patterns In CH From 99-02

Temporal Patterns

BSAI P. cod | GOA P. cod | Pollock



No obvious change

Figures III-4,5,6 p. 93-95

Atka mackerel "platoons"

Table III-5 p. 65

		2001		2002			Compare 02 to 01	
		CH542	CH543	"Platoon"	CH542	CH543	CH542	CH543
A season	Average catch/day	631,242	479,546	1st fishery	448,210	310,033	68%	67%
				2nd fishery	480,560	383,834		
				Combined	428,663	320,246		
	Max daily rate	978,622	829,617	Combined	600,111	642,347	61%	77%
B season	Average catch/day	951,654	461,993	1st fishery	444,763	500,292	49%	88%
				2nd fishery	670,900	381,641		
				Combined	464,860	405,231		
	Max daily rate	1,253,502	973,985	Combined	820,892	662,069	65%	68%

~ 30% drop in average daily catch rate and maximum daily catch rate from 2001 to 2002, below 50% target yet much more substantial than other mechanisms

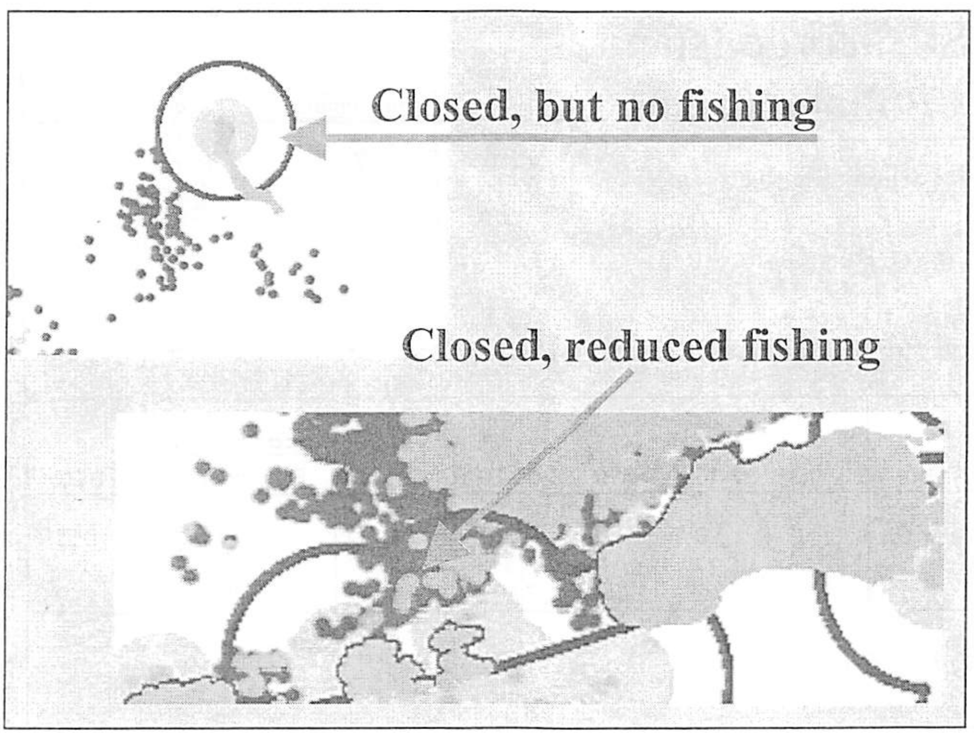
Percent of historical catch displaced by conservation measures

P.Cod		Percent CH displaced		
Area	Gear	1991	1998	1999
GOA	Longline	2	13	4
GOA	Pot	39	31	20
GOA	Trawl	52	22	19
EBS	Longline	2	2	2
EBS	Pot	7	3	5
EBS	Trawl	11	0	4
AI	Longline	23	45	4
AI	Pot	51	79	29
AI	Trawl	36	8	32
TOTAL		19	10	8

Pollock		Percent CH displaced		
Area	Gear	1991	1998	1999
GOA	Trawl	38	52	10
EBS	Trawl	28	1	1
AI	Trawl	74	0	100
TOTAL		32	6	2

Atka Mackerel		Percent CH displaced		
Area	Gear	1991	1998	1999
EBS	Trawl	100	100	100
AI	Trawl	89	1	18
TOTAL		90	2	21

Table III-6 p. 66



Effects on the Prey Field

Table III-7c

	Eastern Bering Sea – Pollock											
January-June Biomass proportions	0-10 nm 8%		10-20 nm 16%		Foraging Area 19%		CH Total 44%		Outside CH 56%		Total 100%	
	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002
Catch mt (thousands)	0.5	2.8	16.1	84.3	178.3	235.2	194.9	322.3	215.7	343.8	410.6	666.1
Biomass mt (age 3+)	870.8	898.8	1,754.8	1,811.1	2,070.4	2,136.9	4,696.0	4,846.8	6,076.0	6,271.2	10,772	11,118
Catch/Biomass	0.1%	0.3%	0.9%	4.7%	8.6%	11.0%	4.2%	6.6%	3.6%	5.5%	3.8%	6.0%
July-December Biomass proportions	5%		10%		12%		28%		72%		100%	
	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002
Catch mt (thousands)	0.6	8.4	25.4	138.0	108.0	268.8	134.0	415.2	433.8	394.5	567.8	809.7
Biomass mt (age 3+)	550.8	566.2	1,094.9	[illegible]	1,132.5	1,117.7	2,778.2	2,746.3	7,583.2	7,705.6	10,361	10,452
Catch/Biomass	0.1%	1.5%	2.3%	13.0%	9.5%	24.0%	4.8%	15.1%	5.7%	5.1%	5.5%	7.7%
Annual Biomass proportions	7%		13%		16%		36%		64%		100%	
	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002
Catch mt (thousands)	1.1	11.2	41.5	222.3	286.3	504.0	328.9	737.5	649.5	738.3	978.4	1,475.8
Biomass mt (age 3+)	870.8	898.8	1,754.8	1,811.1	2,070.4	2,136.9	4,696.0	4,846.8	6,076.0	6,271.2	10,772	11,118
Catch/Biomass	0.1%	1.2%	2.4%	12.3%	13.8%	23.6%	7.0%	15.2%	10.7%	11.8%	9.1%	13.3%

Substantial increase in 0-10 - St. George Is.

Increases in harvest rate in 10-20, close to annual rate (by season)

3.6% - 5.3%
A season rate

Tables III-7a-f p. 67-72

St. George Island Pollock Catch

Table I-3 p. 35

Date	# of animals	Location
1/24/1998	83	Dalnoi Point
3/3/2001	7	Dalnoi Point
3/30/2001	25	Dalnoi Point
2/17/2002	200	Dalnoi Point
3/5/2002	48	Dalnoi Point

- Large increases in catch in 3-10 nm and 10-20 nm over 1999 catch

Pollock catch near St. George Island (Pribilofs) from 1999 and 2002 (mt)

Date	0-3	3-10	*0-10*	10-20	0-20 Total	EBS Pollock Fishery Total	% 0-20
1999	0	0	*0*	3,736	3,736	965,931	0.39%
2002	0	2,346	*2,346*	27,893	30,239	1,460,227	2.07%

Table III-9 p. 73

Studies of Fishery Effects

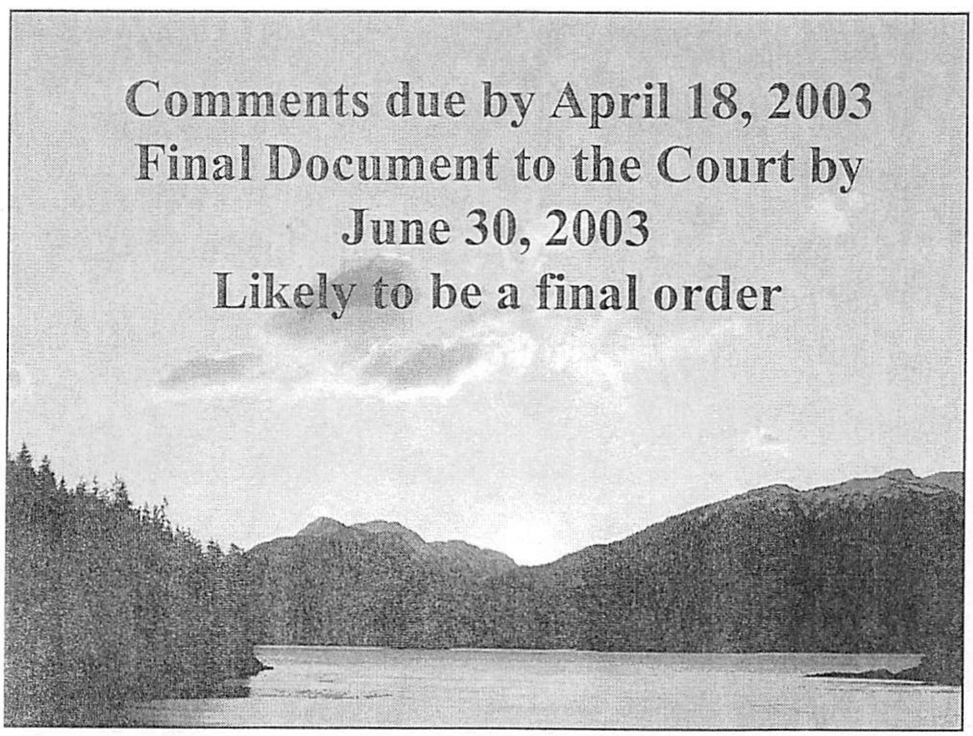
- GOA Pollock (Wilson et al): equivocal, no substantial effects detected, yet unlikely to find them due to variability, 33% local harvest rate
- Atka mackerel: unlikely for there to be substantial effects from fisheries outside the closure areas
- P. cod: project just starting, initial tagging indicates large scale movements after spawning as well as high retention in SSL critical habitat up to 120 days after tagging

Is the Edge Effect Significant?

- Based on the studies so far, this does not appear to be a significant effect on SSL prey inside the closure areas

Section IV: How the Steller Sea Lion Conservation Measures Avoid Jeopardy and Adverse Modification

- This section will be completed once we have finished reviewing sections I-III and received comments or other information offered by the action agency (Council, NMFS, public)



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

March 26, 2003

Mr. David Benton
Chairman
North Pacific Fishery Management Council
605 W. 4th Street, Suite 306
Anchorage, Alaska 99501-2252

Dear Mr. Benton:

Attached for your review and comment at the April 2-8, 2003, session of the North Pacific Fishery Management Council (NPFMC), is an addendum to the 2001 biological opinion on the pollock, Pacific cod, and Atka mackerel fisheries off Alaska. This is in response to the December 18, 2002, remand order by the U.S. District Court for the Western District of Washington, Judge Zilly presiding (Greenpeace v. NMFS, No. C98-492Z). NMFS is presenting further background information on the decision making process in the 2001 opinion as a requirement of a Court order (see memorandum dated January 16, 2003; James W. Balsiger to William T. Hogarth).

This addendum is a focused response which addresses the following items identified by Judge Zilly and remanded back to NOAA Fisheries in his order: (I) the factual basis in the telemetry data (or other new data) for the relative weighting of importance of critical habitat zones; and (II) a comparison of the 1999 "jeopardy" fishery pattern analyzed in the 2000 FMP Biological Opinion and the fishery pattern under the 2001 revised Reasonable and Prudent Alternative, and an explanation of why the 2001 Steller sea lion protection measures relieve the impacts that caused jeopardy and adverse modification of critical habitat.

Section I of this response provides an introduction to the document, an update on the current status of Steller sea lions, and a summary of the Steller sea lion conservation measures. Section II explores the telemetry data, how NMFS has used this information, and new telemetry data on juvenile Steller sea lions. Section III explores the changes to the fishery from 1999 to 2002, the spatial and temporal patterns of the fishery, and the possible effects on the prey field for sea lions. Section IV, which is not included in this initial review draft, will incorporate comments received by NPFMC into sections I-III and also be used in section IV to describe how the Steller sea lion conservation measures avoid jeopardy and adverse modification. The NMFS response is required to be provided to the Court by June 30, 2003.

Comments should be sent to Michael Payne, Assistant Regional Administrator, Protected Resources Divison, NMFS, Alaska Region, P.O. Box 21668, Juneau, AK 99802, Attn: Lori Durall; or delivered to the Federal Building, Fourth Floor, 709 West 9th Street, Juneau, AK, and marked Attn: Lori Durall; or comments may be sent by fax to 907-586-7557. Comments are due by April 18, 2003.

Sincerely,

James W. Balsiger
Administrator, Alaska Region

ADDENDUM TO THE

Endangered Species Act – Section 7 Consultation

Biological Opinion and Incidental Take Statement

of October 2001

Agency:	National Marine Fisheries Service Alaska Region, Sustainable Fisheries Division
Activities Considered:	Authorization of Bering Sea/Aleutian Islands groundfish fisheries based on the Fishery Management Plan for the Bering Sea/Aleutian Islands Groundfish as modified by amendments 61 and 70; and Authorization of Gulf of Alaska groundfish fisheries based on the Fishery Management Plan for Groundfish of the Gulf of Alaska as modified by amendments 61 and 70. Parallel fisheries for pollock, Pacific cod, and Atka mackerel, as authorized by the State of Alaska within 3 nm of shore.
Consultation By:	National Marine Fisheries Service Alaska Region, Protected Resources Division

Initial draft addendum for review
March 31, 2003

DRAFT

EXECUTIVE SUMMARY

This document is an addendum to the 2001 Biological Opinion (2001 BiOp) on the pollock, Pacific cod, and Atka mackerel fisheries off Alaska in response to a remand order by the Court. On December 18, 2002, in the U.S. District Court for the Western District of Washington, Judge Thomas Zilly granted motion for summary judgment (Greenpeace, American Oceans Campaign, and Sierra Club v. NMFS et al. No. C98-492Z). The National Marine Fisheries Service (NMFS) is presenting further background information on the decision making process in the 2001 BiOp as a requirement of this Court order (see memorandum dated January 16, 2003; James W. Balsiger to William T. Hogarth). This addendum is a focused response to issues outlined by the Court and the memo by James Balsiger.

Section I provides an introduction to the document, an update on the current status of Steller sea lions, and a summary of the Steller sea lion conservation measures. Section II explores the telemetry data, and how NMFS has used historic and new telemetry data on juvenile Steller sea lions to show sea lion distribution in, and beyond, critical habitat. Section III explores the changes to the fishery from 1999 to 2002, the spatial and temporal patterns of the fishery, and the possible effects of groundfish fisheries on the prey field for sea lions. Section IV, which is not included in this initial review draft, will summarize sections I-III and describe how the Steller sea lion conservation measures avoid jeopardy and adverse modification. Section IV will be completed once NMFS has completed a thorough review of sections I-III.

Comments will be accepted through April 18, 2003. Comments must be sent to Michael Payne, Assistant Regional Administrator, Protected Resources Divison, NMFS, Alaska Region, P.O. Box 21668, Juneau, AK 99802, Attn: Lori Durall, or delivered to the Federal Building, Fourth Floor, 709 West 9th Street, Juneau, AK, and marked Attn: Lori Durall. Comments may also be sent by fax to 907-586-7557. Comments will not be accepted if submitted via email or the internet.

The remainder of the summary section will be written upon completion of the main document.

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I. Introduction

This document is an addendum to the 2001 BiOp on the pollock, Pacific cod, and Atka mackerel fisheries off Alaska in response to a remand order by the Court. NMFS is presenting further background information on the decision making process in the 2001 BiOp as a requirement of a Court order (see memorandum dated January 16, 2003; James W. Balsiger to William T. Hogarth). This addendum is a focused response to issues outlined by the Court, and the memo by James Balsiger; it does not incorporate information or analyses on ancillary issues surrounding the Steller sea lion decline. New information is being reviewed by NMFS continually, and will be responded to in future consultations as appropriate. This focused approach is discussed further below.

A. Purpose of this addendum

On December 18, 2002, U.S. District Court for the Western District of Washington Judge Zilly granted motion for summary judgment on Greenpeace, American Oceans Campaign, and Sierra Club v. NMFS et al., No. C98-492Z).

In his order, Judge Zilly first found that NMFS's determination that the near shore zone of critical habitat (3 nm to 10 nm) is 3 times more important to the foraging needs of Steller sea lions than the offshore critical habitat (10 nm to 20 nm) was not supported by the filtered telemetry data cited by NMFS and stated that "the relevent filtered data shows that Steller sea lions use the 3-10 nm and the 10-20 nm zones almost equally."

Second, Judge Zilly found that NMFS failed to adequately analyze the likely effects of fishing under the Steller sea lion protection measures on Steller sea lions, their prey, and their critical habitat. In this part of the Order, Judge Zilly concluded that even if NMFS had correctly evaluated the differing importance of the zones of critical habitat, the 2001 BiOp failed to evaluate "the differing effect of the current and proposed level of fishing on those zones of critical habitat and Steller sea lions." Without an analysis of how fishing within critical habitat impacts the differing zones of importance, or an explanation in the record of why such an analysis was not required, Judge Zilly found that NMFS failed to articulate a rational connection between the facts found and the choice made for this item in the biological opinion.

NMFS is therefore providing information to the Court directly related to the issues that were remanded to the Agency.

B. Issues that will be considered in this addendum

This remand response document addresses the following issues noted on pages 27 and 30-32 of the December 18 Order and described in the memo from James Balsiger:

1. The factual basis in telemetry data (and in new data) for the relative weighting of importance of critical habitat zones;

2. A comparison of the 1999 "jeopardy" fishery pattern analyzed in the FMP Biological Opinion (BiOp) and the fishery pattern under the revised Steller sea lion protection measures.

   This comparison (1) addresses the levels of fishery removals in the zones of critical habitat and in critical habitat overall, and the effect of these removals on seasonal prey availability to Steller sea lions of pollock, Pacific cod, and Atka mackerel in critical habitat, (2) addresses the so-called "edge effect" of fishing in offshore critical habitat (i.e., the 10-20 nm zone) on nearshore critical habitat and the sea lions that forage there, and (3) an explanation of why the revised Steller sea lion protection measures relieve the impacts that caused jeopardy and adverse modification of critical habitat.

C. Current status of the species

Since the 2001 BiOp, NMFS has conducted numerous Steller sea lion population surveys. The 2002 non-pup count for the western distinct population segment (DPS) of Steller sea lions indicated a positive increase, the first increase seen in the population since the decline began in the late 1970s. This new information is important to the response to the Order.

Assessments of Steller sea lion population dynamics are based largely on (a) aerial counts of non-pups (juveniles and adults) on rookeries and haulouts, and (b) counts of pups on rookeries in late June and early July. Both kinds of counts are indices of abundance, as they do not necessarily include every site where animals haul out, and they do not include animals that are in the water at the time of the counts. Population size can be estimated by standardizing the indices (e.g., with respect to date, sites counted, and counting method), by making certain assumptions regarding the ratio of animals present versus absent from a given site at the time of the count, and by correcting for the portion of sites counted. Population estimates from the 1950s and 1960s (e.g., Kenyon and Rice 1961; see also Trites and Larkin 1992, 1996) are used with caution because counting methods and dates were not standardized, and the results contain inconsistencies that indicate the possibility of considerable measurement error at some sites in some years. Efforts to standardize methods began in the 1970s (Braham *et al.* 1980); as a result, counts conducted since the late 1970s are the most reliable index of population status and trends.

Non-pup Surveys and Trends

Aerial surveys conducted from 1953 through 1960 resulted in combined counts of 170,000 to 180,000 Steller sea lions in what we now define as the western DPS in Alaska (Mathisen, 1959; Kenyon and Rice, 1961). Surveys during 1974-1980 suggested an equivocal increase to about 185,000, based on maximal counts at sites over the same area, as summarized by Loughlin *et al.* (1984). It was concurrent with the advent of more systematic aerial surveys that population declines were first observed. Braham *et al.* (1980) documented declines of at least 50% from 1957 to 1977 in the eastern Aleutian Islands, the heart of what now is the western DPS. Merrick *et al.* (1987) estimated a population decline of about 50% from the late 1950s to 1985 over a much larger geographical area, the central Gulf of Alaska through the central Aleutian Islands, although this still included a patchwork of regional counts and surveys. The population in the Gulf of Alaska and Aleutian Islands declined by about 50% again from 1985 to 1989, or an overall decline of about 70% from 1960 to 1989 (Loughlin *et al.*, 1992).

The population decline for the western DPS in Alaska has been apparent in all regions, although not at the same rate. The decline was first observed in the eastern Aleutian Islands (Braham *et al.*, 1980). During subsequent years the decline spread into adjacent regions in the Aleutian Islands and Gulf of Alaska (Merrick *et al.*, 1987). In the eastern Aleutian Islands, the rate of decline lessened and by 1989 or 1990 the population there appeared to stabilize, but at very low levels (Table I-1). From 1975 to 2000 there was a steady rate of decline of 6% per year or greater (Figure I-1), with an additional drop of about 8.7% per year during the late 1980s when the population from the Kenai Peninsula to Kiska Island in the central Aleutian Islands declined at about 15.6% per year (York *et al.*, 1996)(Figure I-2). Other regions have demonstrated short periods of stability within a general declining trend. With the exception of the differentiation between the eastern and western DPSs, however, these regional boundaries are not based on ecological or other biological parameters, and differences in regional trends should be interpreted with caution.

From 2000 to 2002, the non-pup population of the western DPS increased by 5.5%. This was the first region-wide increase observed during more than two decades of surveys. Despite this increase, however, the 2002 count was still down 5% from 1998 and 34% from 1991 (Table I-2). The average, long-term trend was a decline of 4.2% per year from 1991 to 2002. Trends were similar in the Kenai-to-Kiska subarea (four regions from the central Gulf of Alaska through the central Aleutian Islands), another geographical region used as a population index (Table I-1). Counts at the 70 Kenai-to-Kiska trend sites increased by 4.8% from 2000 to 2002 but decreased by 26% from 1991 to 2002. The long-term trend across the Kenai-to-Kiska region was a decline of 3.1% per year from 1991 to 2002 (Sease and Gudmondson, 2002)

Although numbers of -non-pups increased in five of the six western-stock sub-regions from 2000 to 2002 (Table I-2), these changes involved only a few hundred animals. The region that continued to decline was the western Aleutian Islands, where numbers decreased by 24% from 2000 to 2002 following a 44% decline from 1998 to 2000. The overall decline in the western Aleutian Islands was 75% from 1991 to 2002 (Sease and Gudmondson, 2002).

Little information exists for the sea lion counts in the Pribilof Islands (EBS). Table I-3 presents data from counts at St. George Island obtained via land based observations by a U.S. Fish and Wildlife Service biologist (Kent Sundseth, pers. comm.). Counts at Dalnoi Point ranged from 7 animals in March 2001 to a high count of 200 animals in February 2002 (Table I-3). Other areas around St. George also were used by sea lions including Murre Rock and Tolstoi Point. Figure I-3 is a photograph from Dalnoi Point taken during the winter on St. George Island; a substantial number of sea lions are visible.

Counts of Steller sea lions in Russian territories (part of the western DPS but to the west of the action area for the BSAI and GOA groundfish fisheries) have also declined and are currently estimated to be about one-third of historic (i.e., 1960s) levels (NMFS 1992). Counts conducted in 1989, 1994, and 1999 indicate that the recent trends in counts in Russia may vary considerably by area (V. Burkanov, pers. comm.). Counts have increased in the northern part of the Sea of Okhotsk and at Sakhalin Island, but decreased at Kamchatka, Bering Island, and the northern half of the Kuril Islands. Whether these changes were due to births and deaths, or immigration and emigration (i.e., a shift in distribution), is unknown. The data suggest that the number of pups born may have increased over the last ten years at 2.7% annually. The sum of the counts conducted in 1989, 1994, and 1999 has increased over the last ten years, but counts at repeated sites have decreased, indicating that trends in Russia cannot yet be described with confidence. Nonetheless, relative to the 1960s, counts in Russia are depressed to a degree similar to that observed for the western population in the U.S.

Pup Surveys and Trends

Pup counts introduce disturbance to the rookeries and are logistically difficult to conduct. Consequently, complete pup counts are attempted only every four years, with counts at selected rookeries during intervening years. The composite 2001/2002 pup count for the western DPS, which included counts from 24 rookeries in 2002 and seven in 2001, showed continuing decline in pup production (Table I-4). For the Kenai-to-Kiska index area, the area with the longest series of region-wide counts, pup numbers were down 7.8% from 1998, 24.5% from 1994, and 42.4% from 1990/1991. Pup counts increased in one region (western Gulf of Alaska: +5.5%) from 1998 to 2002, but declined in the five other regions. The western Aleutian Islands experienced the largest decline (39%) from 1998 to 2002 (Sease and Gudmondson, 2002).

Winter Distribution of Steller sea lions

Sease and York (in press) investigated the winter distribution of sea lions. They reviewed data from aerial surveys during March 1993, November-December 1994, and March 1999. They counted about one-half as many sea lions during winter surveys compared to the breeding-season surveys in the summer. They found that the numbers of sea lions at rookery sites dropped off considerably during winter, whereas numbers at haulout sites did not. They also found little evidence of large-scale, seasonal movement in the western stock of sea lions. Rather, they found that the differences between summer and winter distribution were primarily a function of sea lions dispersing to local haulout sites during the winter. They also concluded that terrestrial sites, both rookeries and haulouts, clearly are important to Steller sea lions during the entire year. Yet, individual sites may be occupied year-round or only during particular times of year (Sease and York, in press).

D. Summary of Steller sea lion conservation measures

This alternative was developed by the Council's RPA committee and adjusted by the Council at its September and October 2001 meetings. This approach allows for different types of management measures in the three areas (AI, BS, and GOA). Essential measures include fishery specific closed areas around rookeries and haulouts, together with seasons and catch apportionments. The mapable features of this alternative are illustrated in Figures I-4 through I-6. Tables I-5 through I-8 shows the site closures for each directed fishery. Table I-9 displays a condensed look at the proposed action in relation to both the 1999 fishery and the RPA from the FMP BiOp. Details are as follows:

Applicable to all fisheries:

- No transit zones around 37 rookeries and no groundfish fishing within 3 nm of 39 rookeries.

Applicable to all pollock, cod, and mackerel fisheries:

- A modified harvest control rule would be applied. If the spawning biomass of pollock, Pacific cod, or Atka mackerel in the BSAI or GOA is estimated to be less than 20% of the projected unfished biomass, directed fishing for that species would be prohibited. The TAC would be limited to amounts needed for bycatch in other fisheries. Essentially, the ABC control rule would remain unchanged, but the regulations would specify that should biomass fall below B20% for one of these species, then directed fishing for that species in the relevant management area would be prohibited.

- The Seguam Pass foraging area, Area 9 (Bogoslof) and Area 4 (Chignik), would be closed to all gear types fishing for pollock, Pacific cod, and Atka mackerel. The Area 4 (Chignik) restriction does not apply to vessels using jig gear.

- No pollock, Pacific cod, or Atka mackerel fishing would be permitted within 0-20 nm of the 5 northern haulouts in the Bering Sea, except jig gear. These include the Round Island (Walrus Islands), Cape Newenham, Hall Island, St Lawrence SW Cape, and St. Lawerence Island, South Punuk Island haulouts.

- The 19 additional "RPA" haulouts would be treated consistently with CH haulouts for the purpose of these regulatory changes affecting the pollock, Pacific cod, and Atka mackerel fisheries.

Applicable to AI pollock fisheries:

- Closure of the Aleutian Islands to directed pollock fishing West of 170 West Longitude in 2002. Directed pollock fishing would open in the Aleutian Islands in 2003 (and thereafter) outside of CH with seasons and TAC apportionments: January 20 to June 10 (40%), June 10 to November 1 (60%).

Applicable to BSAI cod fisheries:

- Establish seasons and TAC apportionments by gear type:

trawl:	January 20 to March 31 (60%), April 1 to June 10 (20%), June 10 through October 31 (20%)
trawl CV	January 20 to March 31 (70%), April 1 to June 10 (10%), June 10 through October 31 (20%)
trawl CP	January 20 to March 31 (50%), April 1 to June 10 (30%), June 10 through October 31 (20%)
hook-and-line, jig:	January 1 to June 10 (60%), June 10 through December 31 (40%)
pot:	January 1 to June 10 (60%), September 1 through December 31 (40%)
pot CDQ	January 1 through December 31
pot or H&L < 60 ft LOA	January 1 to December 31

[*Note: the harvest of cod by the <60' pot and hook-and-line vessels counts towards the 1.4% quota when the season for vessels >=60' using pot or hook-and-line gear is closed. At other times it counts to the 18.3% or 0.3% quotas, as appropriate.*]

- Pacific cod rollover in the BSAI: Unharvested cod TAC can be rolled over from one season to the next, consistent with bycatch consideration objectives of optimizing catch by gear groups and sectors.

- Roll over the seasonal apportionments of TAC so as to maximize the opportunities for Pacific cod harvests by the trawl sector. Cod rollovers within the trawl sector would occur within a season prior to allocating to other gear types. Such rollovers would continue into subsequent seasons, but may be reallocated if one sector is unable to reach its TAC.

- Establish area restrictions based on gear type:

In the Aleutian Islands

Hook-and-line and Pot:	No fishing in critical habitat east of 173° West to western boundary of Area 9; 0-10 nm closures at Buldir; 0-20 nm closure at Agligadak.
Trawl:	East of 178° West longitude: 0-10 nm closures around rookeries, except 0-20 nm at Agligadak; 0-3 nm closures around haulouts.
Trawl	West of 178° West longitude: 0-20 nm closures around haulouts and

rookeries until the Atka mackerel fishery inside CH A or B season, respectively, is completed, at which time trawling for cod can occur outside 3 nm of haulouts and 10 nm of rookeries.

In the Bering Sea

0-3 nm closures around all rookeries and haulouts (except with jig gear around haulouts).

0-10 nm closures around all rookeries and haulouts for trawl gear (except the Pribilof haulouts that would be closed 0-3 nm).

0-7 nm closure around Amak rookeries for hook-and-line and pot gear.

0-10 nm closure around Bishop Point and Reef Lava haulouts in Area 8 for vessels greater than or equal to 60 ft length overall using hook-and-line gear.

Applicable to BSAI Atka mackerel fisheries:

- Establish two seasons and TAC apportionments: January 20 - April 15(50%), September 1 - November 1 (50%). For the CDQ fisheries, CDQ Atka mackerel fishing would occur during a single season per the 2001 provisions.

- TAC would be further apportioned inside and outside of critical habitat, with 60% inside and 40% outside.

- During each season, fishing would begin first in Area 541. Fishing would begin in Areas 542 and 543 48 hours following the closure of Area 541.

- A system of platoon management would be implemented for Areas 542 and 543 in each season. Platoons will only affect fishing inside critical habitat.

  Vessels wishing to fish in critical habitat would register with NMFS to fish in Area 542, in Area 543, or in both Areas 542 and 543. The vessels registering to fish in an area would be assigned to the "group" for that area. There would be an Area 542 group and an Area 543 group. Vessels registering for both areas would be placed in both groups.

  Two directed fisheries would be defined for each area. Directed fisheries in an area would take place in sequence with defined start and stop dates; directed fisheries could last no longer than 14 days.

  Half of the vessels in each group would be assigned (at random) to a "platoon" to participate in each of the directed fisheries (although one platoon would have one more vessel than the other if there were an odd number of vessels in the group). A vessel wishing to fish in critical habitat in Area 542 and Area 543 would be first assigned to an Area 542 platoon at random. That vessel would then be automatically assigned to a platoon in Area 543 that participated in a directed fishery taking place at a different time. Thus a vessel in the 542 and 543 groups that was assigned, at random, to the platoon for the first directed fishery in Area 542 would automatically be in the platoon for the second directed fishery in Area 543. If the vessel had been randomly assigned to the platoon for the second directed fishery in Area 542, it would be in the platoon for the first directed fishery in Area 543.

Once registered for a critical habitat area directed fishery in a season, vessels would be prohibited from fishing in any other fishery until the assigned critical habitat fishery is closed. If they have registered for both areas, this applies only to the first directed fishery to which they are assigned.

The CH limit (60% of the annual TAC) for the area is divided between the platoons in proportion to the number of vessels in the platoon compared to the number of vessels in the area group. Directed fisheries close when the TAC limit to the fishery has been reached or the closure date is reached.

The platoon system does not extend to waters outside of critical habitat. These waters remain open to the operations of vessels in either platoon or vessels that are not in either platoon.

- No directed fishing for Atka mackerel in critical habitat around rookeries and haulouts east of 178° West longitude (including critical habitat in the Bering Sea management area). Does not include the SCA outside of the Bogoslof foraging area.
- 0-10 nm closures around rookeries west of 178° West longitude, and 0-15 nm at Buldir.
- 0-3 nm closures around haulouts (except with jig gear).
- Two observers are required for each vessel fishing in critical habitat.

Applicable to Bering Sea pollock fisheries:

- Establish seasons and TAC apportionments: January 20 to June 10 (40%), June 10 to November 1 (60%).
- No fishing for pollock during the A season within an area north of the Alaska Peninsula and Aleutian Islands chain approximately 10 nm from shore, based on a series of straight lines that are tangent to haulouts in the area. (Bering Sea Pollock Restriction Area (BSPRA))
- 0-10 nm closures around all rookeries and haulouts (except the Pribilof haulouts that would be closed 0-3nm).
- The 'Catcher Vessel Operational Area' would be closed to trawl catcher/processors during the B season (June 10 to November 1).
- A limit on the amount of pollock taken within the SCA would be established at no more than 28% of the annual TAC prior to April 1 each year. The remaining portion of TAC available prior to June 10, or 12% of the annual TAC, may be harvested outside of the SCA before April 1 or inside SCA after April 1. If the 28% was not taken in the SCA prior to April 1, the remainder can be rolled over to be taken inside after April 1. The SCA harvest limits would be allocated to sectors proportionately, so that each sector can harvest no more than 28% of its allocation prior to April 1 in the SCA.

- Set aside such A season pollock quota in the SCA as needed for vessels < 99 feet LOA to harvest their full A season pollock quota in the SCA during the period from January 20th through March 31.

- Catcher vessel exclusive fishing seasons for Bering Sea and GOA pollock would continue so that:

  Catcher vessels are prohibited from participating in directed fishing for pollock under the following conditions. Vessels less than 125 ft (38.1 m) LOA are exempt from this restriction when fishing east of 157°00' W. long.

If you own or operate a catcher vessel and engage in directed fishing for pollock in the	**During the...**	**Then you are prohibited from subsequently engaging in directed fishing for pollock in the...**
Bering Sea subarea	A season (1/20 - 6/10)	GOA until the following C season (8/25)
	B season (6/10 - 11/1)	GOA until the A season of the next year (1/20)
GOA	A season (1/20 - 2/25)	BS until the following B season (6/10)
	B season (3/10 - 5/31)	BS until the following B season (6/10)
	C season (8/25 - 9/15)	BS until the A season of the following year (1/20)
	D season (10/1 - 11/1)	BS until the A season of the following year (1/20)

Applicable to Gulf of Alaska pollock fisheries:

- Establish seasons and TAC apportionments:
  A season = January 20 to February 25 (25%)
  B season = March 10 to May 31 (25%)
  C season = August 25 to September 15 (25%)
  D season = October 1 to November 1 (25%)
  [Note: Rollovers of TAC apportionment are allowed, provided that no rollover is more than 30% of annual TAC for an individual management area.]

- Catcher vessels would continue to be prohibited from retaining on board, at any time, more than 300,000 pounds (136 mt) of unprocessed pollock. Tender vessels would continue to be prohibited from (i) operating as a tender vessel east of 157° W. longitude and (ii) operating as a tender vessel west of 157° W longitude while retaining on board at any time more than 600,000 pounds (272 mt) of unprocessed pollock.

- Catcher vessel exclusive fishing seasons for BS and GOA pollock would continue (see Bering Sea pollock fisheries).

- No directed pollock fishing in the areas listed:

Area 1:	0-20 nm from all rookeries and haulouts, except 0-10 nm around Middleton Island
Area 2:	0-10 nm from all haulouts. 0-20 nm closures at Pye Island and Sugarloaf rookeries. 0-15 nm closures at Marmot Island in the first half of the year, and 0-20 nm in the second half of the year.
Area 3:	0-10 nm from all rookeries and haulouts except 0-3 nm at Cape Barnabus and Cape Ikolik. 0-10 nm closures at Gull Point and Ugak Island during the first half of the year and 0-3 nm during the second half of the year.
Area 4:	0-20 nm from all haulouts and rookeries.
Area 5:	0-20 nm from all rookeries and haulouts, except 0-3 nm at Mitrofania, Spitz, Whaleback, Sea Lion Rocks, Mountain Point, and Castle Rock..
Area 6:	0-10 nm from all rookeries and haulouts, except 0-3 nm at Caton and the Pinnacles.
Areas 10 and 11:	0-20 nm from all rookeries and haulouts.

<u>Applicable to Gulf of Alaska cod fisheries</u>:

- Establish seasons and TAC apportionments:
  A-season = 60% of TAC: January 1 hook-and-line, pot, or jig, January 20 trawl, until June 10, at which time directed fishing for Pacific cod by all gear would be prohibited until September 1.
  B-season = 40% of TAC: September 1 all gear types to November 1 for trawl gear and December 31 for non-trawl gear. Pacific cod bycatch taken between June 10 and August 31 will be subtracted from the B season apportionment.

- No <u>trawling</u> for cod in the areas listed:

Area 1:	0-20 nm from all rookeries and haulouts, except 0-10 nm around Middleton Island.
Area 2:	0-10 nm from all haulouts. 0-20 nm closures at Pye Island and Sugarloaf rookeries. 0-15 nm closures at Marmot Island in the first half of the year, and 0-20 nm in the second half of the year.
Area 3:	0-10 nm from all rookeries and haulouts except 0-3 nm at Cape Barnabus and Cape Ikolik. 0-10 nm closures at Gull Point and Ugak Island during the first half of the year and 0-3 nm during the second half of the year.
Area 4:	0-20 nm from all haulouts and rookeries.

Area 5: 0-20 nm from all rookeries and haulouts, except 0-3 nm at Mitrofania, Spitz, Whaleback, Sea Lion Rocks, Mountain Point, and Castle Rock.

Area 6: 0-10 nm from all rookeries and haulouts, except 0-3 nm at Caton and the Pinnacles.

Areas 10 and 11: 0-20 nm from all rookeries and haulouts.

- No jig gear fishing from 0-3 nm of all rookeries.

- No directed fishing for cod with pot or hook-and-line gear in the areas listed.

Area 1: 0-3 nm from all rookeries.

Area 2: 0-10 nm closures at Pye Island, Sugarloaf, and Marmot.

Area 3: 0-3 nm around Cape Barnabus and Cape Ikolik haulouts.

Area 4: 0-20 nm from all haulouts and rookeries.

Area 5: 0-3 nm from all rookeries and Mitrofania, Spitz, Whaleback, Sea Lion Rocks, Mountain Point, and Castle Rock haulouts.

Area 6: 0-3 nm at Caton and the Pinnacles.

Areas 10 and 11: 0-20 nm from all rookeries and haulouts for pot gear; 0-10 nm from all rookeries and haulouts for hook-and-line gear.

- Unalaska small boat exemption. This option would establish a fishing zone for Pacific cod in the Dutch Harbor area (area 9) for jig, and hook-and-line catcher vessels less than 60 ft. This fishing zone would encompass all waters of the Bering Sea south of the line connecting the point 3 nm north of Bishop Point to Cape Tanak. This option would include a 10 nm radius closure around the Bishop Pt haulout in Area 9. This area would fish under a 250,000 lbs. Pacific cod harvest cap.

E. Analysis of closed areas under the proposed action

Under the Steller sea lion conservation measures implemented in 2002, a complex suite of open and closed areas was used based upon the individual fishery. For that reason, it is impossible to easily sum these various closures and determine how much of the area is closed to fishing as was done under previous pollock trawl closures where only one fishery was closed. This action which represents more of a mosaic is best described by looking at each individual fishery and area to determine what is actually closed and open inside Steller sea lion critical habitat.

Table I-10 displays the amount of area closed and area composed of each critical habitat zone and for each fishery and area. Table I-11 presents this information as a percentage of each zone which is closed within critical habitat, and Figure I-7 is a graphical representation of Table I-11 sorted by amount of the 0-10 nm zone closed, plotted with the associated closures in 10-20 nm for each particular fishery.

II. The Importance of Critical Habitat Zones and Telemetry Data

In this section we describe the telemetry information available, and the use of that information in the weighting of critical habitat zones of concern by NMFS.

A. Background on the use of telemetry in biological opinions

In previous biological opinions, NMFS has used telemetry data as a tool to define important Steller sea lion foraging areas, and then used that information to minimize the spatial and temporal overlap with commercial fisheries. In the FMP BiOp (their Table 4.3, presented here as Table II-1) the telemetry data was composed of pups and adults, stratified by season, and by location either inside or outside of critical habitat (FMP BiOp pages 87-88). NMFS concluded from this information that sea lions relied heavily on critical habitat and the foraging areas for survival.

For the 2001 BiOp NMFS utilized a variety of new telemetry information in order to determine whether the action was likely to adversely affect Steller sea lions. That information is presented in section 5.2 of that document on pages 134-145. For that opinion, NMFS summarized telemetry data from pups and juveniles less than 13-14 months of age in sub-areas within critical habitat (see their Table 5.1). NMFS was able to compare complex management measures with Steller sea lion foraging habitat by zones, or distances from land within critical habitat. However, NMFS was concerned about a potential nearshore bias in the data and attempted to bracket this with an additional analysis referred to as the "filtered data set" (their Table 5.1b). Unfortunately, the filtered data analysis was not conclusive because it was based on a premise which was arbitrary (i.e., a 90% filter inside 0-2 nm).

Information contained in the filtered database from the 2001 BiOp will not be used further in this remand response. Instead, NMFS has developed a new analysis which the agency has determined is more responsive to the questions regarding bias raised in the 2001 BiOp (see section II(C) below). In this analysis we will be using the data in Table II-2 (revised Table 5.1a from the 2001 BiOp) which utilizes only the unfiltered database from the 2001 BiOp, as well as new information in determining the relative importance of zones of critical habitat to Steller sea lions.

Previously NMFS used the 0-3 nm and the 3-10 nm zones to assess the relative foraging needs of Steller sea lions and the management response used to protect this habitat from adverse modification. Here, we have chosen to combine these two zones (see Table II-2) using only the unfiltered database from the 2001 BiOp (their Table 5.1a), plus additional new telemetry data gathered since the 2001 BiOp was prepared. In the 2001 BiOp, NMFS rated both the 0-3 nm zone and the 3-10 nm zone as a "high" concern (2001 BiOp Table 5.2). However the 10-20 nm zone was rated as "low to moderate" with the rationale that the low rating reflected the relatively low utilization of this zone by Steller sea lions, and the moderate rating was influenced by the ability of this area to act as a buffer between adjacent commercial fisheries and important foraging locations within 10 nm of rookeries and haulouts. For this analysis, NMFS has merged the 0-3 nm and the 3-10 nm zones of concern because they reflect the most important foraging areas (both rated high based on telemetry; see Table II-6) and due to the level of accuracy inherent in the telemetry data. By splitting the telemetry data into a 0-3 nm zone and a 3-10 nm zone NMFS scientists feel this would be misleading, and would go beyond the accuracy of the data. This change is scientifically appropriate to avoid overstating the reliability of the telemetry locations. For example, in Figures II-1 through II-4, many points can be seen which occur over land and are obviously in error. These obviously erroneous points were removed before performing the analysis of the data for the tables, but it points out that the accuracy of all these locations is somewhat questionable and should be treated with caution over fine geographic scales.

B. Overview of telemetry information

There have been numerous publications describing foraging behavior and ontogeny of Steller sea lions using telemetry. NMFS has reviewed these in both the FMP BiOp and the 2001 BiOp (pages 136-139). NMFS has also performed a variety of new analyses in order to answer the particular questions raised under section 7 consultations. In this section we again review the telemetry data available to NMFS.

Table II-3 presents the limited information that we have on adult Steller sea lions from Merrick (1995) and Merrick and Loughlin (1997). In general, females with pups stayed close to a particular rookery in the summer (likely to be lactating females) and ranged much further from their capture site in the winter time (66.7% of the locations beyond 20 nm of their capture point). The importance of adult Steller sea lions in the current decline is unclear. A recent paper by York and Holmes (in press) indicates a drop in fecundity and juvenile survivorship from 1993-1998. A decrease in fecundity suggests that adult females may be having difficulty finding adequate prey resources to either become pregnant or carry the fetus to full term. Additionally, new information suggests that there may be a density-dependent signal in the Steller sea lion decline (i.e., larger rookeries and haulouts declined faster than smaller sites from 1981-1991), which is also suggestive of a reduction in carrying capacity (Hennen, pers. comm.). In summary, adult females may be an important component of the current decline. Current research projects are expected to explore this issue further over the next few years. NMFS is also concerned about the survival of pups and juveniles which are more likely to be susceptible to prey depletions by commercial fisheries (see 2001 BiOp, sections 3.4.2; 4.2.13; 4.3.2; and 4.3.3). As described in York and Holmes (in press), juvenile survivorship was very low from 1983-1987, and dropped again from 1993-1998, and therefore is likely to be playing a role in the continued Steller sea lion decline in the western population.

Loughlin et al. (2003) explored the types of trips made by sea lions under 18 months of age (Table II-4). They define three types of trips: transit, long-range, and short-range. Most notably, they found that the long range trips begin at about 9 months of age and represent about 6% of the total trips. Short-range trips, which were within 1.9 nm of the capture point, represented 88% of all trips. However, we know that there has been a disproportionate number of pups instrumented vs. juveniles (2 and 3 year olds), which may bias the information on sea lion geographic distribution with data on animals that are still nursing and may not be foraging on their own. A critical question before us is at what age do sea lions wean and begin foraging on their own, and then where do they go? This question is made more complex because weaning is a process that may be extended for up to 2 years in some animals.

Table II-5 is a compilation of data from a number of published reports showing the distance from the capture site traveled by juveniles and adult females. Again, at about 10 months of age, juvenile animals begin to travel greater distances, with some trips about 10 times farther than pups (on average). And because adult females travel about 8 times farther in the winter than in the summer, this may indicate that females in winter can leave the rookery for longer periods of time and thus have less of a requirement to return quickly to a nursing pup. Note also that adult sea lions can range widely, up to 293 nm (Table II-4).

From these results, it appears that pups stay near shore until about 9 months old; at this point they begin more exploratory movements further offshore and begin acting more like adults. Of critical importance is not just the range of these animals but the distance from shore that they travel; taken in their entirety, these data form the basis for establishing the importance of offshore areas of critical habitat which extends to 20 nm in most areas and as far as 100 nm offshore in the foraging areas.

C. Juvenile foraging behavior based on filtered telemetry data

In an effort to further understand the characteristics of foraging juvenile Steller sea lions, using new telemetry data, NMML prepared a series of analyses in January and February of 2003. These were based on juvenile Steller sea lion dive locations derived from satellite transmitters during the three-year period 2000-2002. The analysis included data from juvenile sea lions equipped with satellite transmitters captured in the central Gulf of Alaska near Kodiak Island, the Unimak Pass area, and near Seguam Island in the central Aleutian Islands. This is additional satellite transmitter information previously not in the administrative record for the 2001 BiOp. This supplemental information utilizes only those locations recorded during periods for which dive data were received and only those data of adequate quality to assign location accuracy (i.e., dive sorted). The earlier data set contained 30,618 locations (2001 BiOp); this dive-sorted set contains 10,006 locations. The reason for conducting this analysis was to present only those locations associated with dive data and therefore improve the analysis presented in the 2001 BiOp (their Table 5.1b).

Methods

The transmitters that NMFS uses were developed by Wildlife Computers, Inc., Redmond, WA. Earlier versions of these were termed satellite-linked time-depth recorders (SLTDR) while more recent versions are called satellite dive recorders (SDRs). The data used in these analyses are based on SDRs which provide up to five data categories: (1) dive depth, (2) dive duration, (3) proportion of time at depth, (4) transmitter status, and (5) time line. Time-line messages provide information as to whether the instrument was wet or dry >10 min of a 20 min period, and thus allows calculation of time spent at sea and on land.

Locations are obtained either when a sea lion is on land or at sea and on the surface frequently enough for one of the six polar-orbiting Argos satellites to receive two or more transmitted messages containing one or more of the five data categories. Because of the near-polar orbit of the six satellites, the number of daily passes over a transmitter increases with latitude. A single satellite will have approximately 14 passes at the pole and 6-7 at the equator. But also because of the orbit, each satellite passes within visibility of any given transmitter at almost the same local time each day. The Argos system calculates a location from multiple messages based on the "Doppler" effect of the received signal; location data are not provided by the satellite transmitter, *per se*. Messages are sent from the transmitter at prescribed intervals; the transmission interval at sea is approximately every 43 seconds (once the saltwater switch determines that it is out of the water), and on land it is every 1 min 28 sec. The number of transmissions (and thus messages received) while at sea depends largely on the frequency with which the SDR's salt-water switch is exposed at the surface. Since location data are not sent by the transmitter but are calculated by Service-Argos based on the received messages, a location may or may not contain dive information. For example, once a diving sea lion surfaces, the saltwater switch tells the transmitter that it is out of the water, and the unit transmits a message containing one or more of the five data categories. If one of the six Argos satellites is overhead, the message will likely be received. The transmitter will not be allowed (by programming) to transmit again for at least 43 seconds. If it dives and surfaces before then, it will not transmit. For an actively diving sea lion, the number of successful transmissions is less than for an inactive animal floating on the surface, or in shallow water near shore, since the probability of surfacing for the required amount of time, and with a satellite overhead, is less. For those animals that are in shallow water near shore with regular exposure of the saltwater switch to the surface, the likelihood of transmission and reception is much higher resulting in a disproportionate number of locations near shore.

Software programming of the SDR subdivided each day into four 6-hour periods (e.g., 2100-0300 h, 0300-0900 h, 0900-1500 h, and 1500-2100 h local time). These periods are defined by the manufacturer; the hours within the periods can be changed by the user but not the duration of the time period. To save battery power and prolong transmitter life, NMFS programs their transmitters to transmit 4 hours during each 6-hour period. These transmission hours are based on the probability of satellite coverage over the earth where the transmitter was deployed. The SDRs collect data in these 6-hour time periods and store them in the five categories described above. Thus, some dive data will be stored in a time period and transmitted to the Argos satellite while the animal is at sea, but other transmissions may occur once the animal is on land (even though it was at sea and diving a few hours previous). In order to optimize the presentations that follow, the data were sorted to remove those locations where the animal was on land and no dive data were obtained (on land for more than 6 hours), and those data from land where dive data were included but for which a location at sea could not be determined.

Each of the data categories is sub-divided into "bins" based on the type of data being collected. For the dive data, the three categories (depth, duration, proportion of time) are divided into user defined bins that are presented as histogram data. It is important to note that the SDRs were programmed to start recording dives once the animal (transmitter) was 4 meters or more below the surface. The dives were then grouped into 14 separate "bins"(e.g., 4 m; 4-6 m, 6-10 m, 10-20 m, 20-34 m, 34-50 m, 50-74 m, 74-100 m, 100-124 m, 124-150 m, 150-174 m, 174-200 m, 200-250 m, and >250 m). For this remand response, we have not provided the data associated with the dive categories but rather all locations where diving occurred regardless of dive depth, duration, or time at depth.

Locations are estimated based on the Service-Argos classification scheme where Location Class (LC) 3 is accurate to <150 m, LC 2 is accurate to 150 m - ≤350 m, LC 1 is accurate to 350 m - ≤1000m, and LC 0 is accurate to >1000 m. LCs A and B have no accuracy assigned, and a LC Z has failed the Argos location validation test. However, some researchers have used an algorithm to filter satellite locations and found that both filtered and unfiltered LC A locations were of a similar accuracy to LC 1 locations. The set of data used in this analysis were filtered based on these location qualities, as described in the Data Analysis section in Appendix I. The maps that accompany this section contain some locations that are plotted on land due to the error associated with some of the lower quality LCs recorded during periods that contain dive data. All of the data in the plots were used in the analysis.

Results

The information presented in this section includes locations associated with diving for 63 juvenile Steller sea lions in western Alaska (two sea lions had two different instruments attached so the total number of SDRs is 65). The raw data are presented in Appendix I. Tables I-2 and I-3 of Appendix 1 indicate the distances from the nearest listed rookery and haulout site (see 50 CFR 226.202 for a list of all critical habitat locations), whereas Tables I-4 and I-5 of Appendix I show distances from the nearest point of land. Tables I-6 though I-9 of Appendix I present the data as distance from the nearest rookery and haulout site sorted by the age of the animal (< or > than 10 months of age). The following discussion of summary tables (below) was derived from the data in Appendix I.

First, as an overview, we plotted the sum of the telemetry information for all 63 juvenile sea lions by area regardless of location quality (Figures II-1 to II-4). Figure II-1 is a wide angle view showing the three major areas of the BSAI and GOA that had instrumented animals; Kodiak, Unimak Pass, and Seguam. Each subsequent set of figures is split into summer (April - September) and winter (October - March) seasons. The darker gray arcs represent 0-10 nm of critical habitat, the lighter gray 10-20 nm critical habitat, and the cross-hatched areas represent the critical habitat foraging areas. Figure II-5 overlays the telemetry data with Steller sea lion closure areas around Kodiak.

In Table II-6, the telemetry locations are summarized from Appendix I, indicating both the distance from shore or the distance from a listed rookery or haulout. The first two columns of the table present the distance from a listed rookery or haulout site by season and zone, and the right two columns provide the same telemetry data but as the distance from the nearest point of land. This is an important distinction to make and has consequences when comparing the efficacy of the Steller sea lion conservation measures. In the 2001 BiOp (their Table 5.1), telemetry data were presented as the distance from the nearest point of land. However, the sea lion conservation measures (area closures) were designed to protect a given distance from a rookery or haulout site. In this analysis we calculated both the distances to determine if there was a difference between the two approaches.

To illustrate this difference, Figure II-6 depicts the difference in total area between 20 nm from a listed rookery or haulout site vs. 20 nm from land in the Aleutian Islands. As seen here, in some areas there can be a substantial difference in the area protected depending upon the approach. Looking at the data (Table II-6), the number of dive-associated locations in the 0-10 nm zone is about 8% higher under the columns for distance from land, whereas, the locations are higher in the 10-20 nm zone under distance from a rookery or haulout. As described above (Figure II-6), rookeries and haulouts are at discrete locations along the shoreline and are not continuous. Because sea lions depart from these specific sites for foraging trips, they may travel 15 nm from a rookery or haulout yet be close to shore. Because of this effect, we will use the data indicating distance from a rookery or haulout whenever possible, and will take this factor into account qualitatively when reviewing older telemetry data that we are unable to present in this format (i.e., information previously published).

In summer juveniles sea lions predominately use the 0-10 nm zone of critical habitat (88.9%), followed by 5.8% in 10-20 nm, and 2.4% in the foraging areas beyond 20 nm (Table II-6). In the winter the pattern is similar with 90.3% inside 0-10 nm, and 7% in 10-20 nm. This data supports a conservation approach involving greater protection inshore than offshore, because the 0-10 nm zone was used about 10 times as much as the all the areas beyond that combined. This is similar to the results presented in the 2001 BiOp (their Table 5.1a) and presented here as Table II-2 indicating a preponderance of locations near shore. However, in winter this analysis (Table II-6) supports more use of the 10-20 nm zone (7%) as opposed to only 0.6% in the analysis from the 2001 BiOp (their Table 5.1a). Again, we need to be cautious when comparing these two tables as they represent different data sets. In this new analysis, the data includes only older pups and juveniles from 2000-2002, whereas the previous analysis included juvenile sea lions from 1990-2000. In many ways this new analysis on juveniles is more focused on their foraging behavior and removes some of the bias with non-foraging telemetry locations that was an issue with the analysis in the 2001 BiOp. However, we can conclude that there is a dependence on the 10-20 nm zone.

Knowing that some of the sea lion locations presented in Table II-6, are from older pups 9 months of age, we then explored the age distribution within this juvenile database. The rationale for this analysis is that there appears to be a substantial change in foraging behavior when pups move into a juvenile life stage (see Tables II-4 and II-5). We stratified the data by age with sea lions 0-10 months old in one bin and animals older than 10 months in a separate bin. Table II-7 displays the stratified data by age for both summer and winter. The summer data is similar to non-stratified data in Table II-6. However, in the winter (for animals greater than 10 months of age), only 67.9% of the locations were within 10 nm of a rookery or haulout, while 22.4% of the locations were in the 10-20 nm zone. Overall, 30.1% of the locations were in critical habitat beyond 10 nm in the winter for the juveniles older than 10 months. These data support other research which indicates that post-weaning, animals tend to travel farther from rookeries and haulouts (Loughlin et al., 2003).

Because juvenile survival is an important component of the current decline, we further explored the underlying data for the older juveniles (data from Appendix I, Table I-8 and I-9). For sea lions greater than 10 months of age, the distribution of ages in the analysis was the following:

	Number of Animals	
	Summer (Apr-Sep)	Winter (Oct-Mar)
11-12 months of age	30	0
13-18 months of age	7	3
19-24 months of age	4	5
> 2 years old	5	0

This indicates that the vast majority of the summer data are from sea lions of 11 to 12 months of age (30 sea lions), while none of the winter data were collected on animals this young. In the winter, most of the data were collected from animals older than 18 months (the youngest was 15 months old when it was transmitting in October). For the winter, the data from 5 of the animals were collected in March, and from the other 3 between October and December (no data were collected on these older animals in Jan-Feb). Again, the summer data may be dominated by the 30 sea lions which were transmitting locations between 11 and 12 months of age, while the winter data could in fact be more indicative of juvenile behavior as it represents sea lions over 18 months of age.

In March, sea lions in the Unimak pass area (n=3) didn't stray far from shore (all with >96% in 0-10 nm), a time period when gadids are in dense spawning aggregations nearshore, but the sea lions in the Kodiak area (n=2) in March showed very different patterns: (1) a 21 month old with 89% in 0-10 nm and 11% in 10-20 nm, and (2) a 21 month old with 17% in 0-10 nm, 10% in 10-20 nm, and 73% in beyond 20 nm, but still in critical habitat. There were 2 animals instrumented in the fall in the Kodiak area: (1) a 15 month old that was 91% in 0-10 nm and 9% in 10-20 nm, and (2) a 16-17 month old that was 63% in 0-10 nm, 33% in 10-20 nm and 4% in beyond 20 nm, but still in critical habitat, and <1% beyond critical habitat. There was 1 animal instrumented in the fall in the Unimak area: a 16-17 month old that was 63% in 0-10 nm, 28% in 10-20 nm, and 10% beyond critical habitat.

In an effort to bring this telemetry information together in a qualitative way, we have composed a matrix (Table II-8) describing the age class of Steller sea lions and a generalized set of behavior patterns for both the summer and winter. This integrates all of the telemetry information discussed above, especially the new information we have obtained over the last year regarding the possible change in behavior of pups after their first year. Young of the year (<11 months of age) appear to stay close to shore during summer and winter. Juveniles older than 1 year travel farther. There may be a transition period in the fall that is important for younger animals, particularly those starting their second year. The fall would also be a period of transition for adult females; not only would they be nursing a pup (which would be about 5 months old), but they would are also likely to be pregnant, and therefore have high energetic demands. From the information at hand, it would be inappropriate to lump all of the telemetry data together given that various age classes of animals appear to be behaving quite differently, with a greater dependence on foraging areas further from shore as the sea lion matures and perhaps has more developed physiological abilities to dive to greater depths and swim greater distances.

D. Summary of the factual basis for weighting importance of critical habitat zones

The purpose of this section is to determine "the factual basis in telemetry data (and in new data) for the relative weighting of importance of critical habitat zones" (see section I(B)). Above is a thorough discussion of the types of telemetry data at hand by NMFS in determining the relative importance of critical habitat areas. In general it shows a dependence upon nearshore areas, especially by young-of-the-year (YOY). Adults and juveniles (10 months to 2 years of age) tend to range farther from their point of capture, and also farther from shore. The new dive filtered analysis shows that YOY (10 months of age) spend about 90% of their time diving within 10 nm of a rookery or haulout site (Table II-7). For juveniles >10 months of age and less than 2 years, they also use nearshore areas heavily, about 87% within 0-10 nm in the summer, but only 67.9% in the winter (Table II-7). For the winter, 30.1% of the telemetry locations were within critical habitat areas farther than 10 nm from a rookery or haulout. It is important to note that this summary is based on a sample size of 8 animals, of which 7 used the 10-20 nm zone to some extent while only one animal spent all of its time within 0-10 nm. The fall/winter time may be an important transition period for these animals entering their second year as well as for lactating females which may also be pregnant. Older juveniles (>16 months) also tended to travel farther from shore in the winter. To date, researchers have inadequate telemetry information on animals from 2-4 years of age, the time period which may be crucial to their survival. A summary of this information has been developed in Table II-8.

Table II-9 reflects the current rating of zones of critical habitat which remains unchanged from the 2001 BiOp, the last two columns provide some of the data used to describe the rationale for these concerns. The data in table are provided because they represent the most important subset of the sea lion population that NMFS is concerned about, i.e., juveniles learning to forage on their own (animals greater than 10 months of age). We present data from both summer and winter, but focus particularly on winter because this is the time of year when animals may have fewer prey resources available to them such as salmon and herring which are often near shore and in dense aggregations in the summer. There is a reasonably strong relationship in the telemetry data which indicates that the area within 0-10 nm of rookeries and haulouts is the most important in terms of the amount of usage (Tables II-5, II-6, and II-7). This clearly represents an area of high concern for potential overlap with commercial fisheries that could cause depletions of prey resources possibly resulting in an adverse modification of critical habitat.

The 10-20 nm zone is much more difficult to characterize than the 0-10 nm zone. For example, the older juveniles, utilize this area to a greater extent than YOY (Table II-7) and even the adults (Table II-2). However, our sample size for the winter data set (Table II-7) is low (8 animals). When we look at the data for all the juveniles (Table II-6) there is an even greater reliance on the 0-10 nm zone than the 10-20 nm zone (roughly 90% inside 10 nm), yet we know that these data are overwhelmed by a preponderance of YOY.

Juvenile sea lions at 10 months of age do not have the same physiological capacity for diving as adults. While juveniles have the same blood volume and oxygen-carrying ability as adults at about 10 months of age, they do not attain the same level of myoglobin in muscle until they are about 2-3 years old. As a result, juvenile sea lions cannot stay submerged as long as adults and they require longer surface intervals between dives, though they may have similar maximum dive depths. This would make juveniles (up to at least age 3) more vulnerable than adults to decreases in prey availability (Burns, Richmond; pers. comm.).

Given the overall low number of locations in the 10-20 nm zone (Table II-6), and the fact that there are about one third the number of locations in 10-20 nm as in 0-10 nm for the animals of most concern (see Table II-7, animals in winter >10 months of age), and the greater reliance on this zone by the older juveniles in winter (Table II-7), NMFS rates the 10-20 nm zone as a "low to moderate" concern (Table II-9). Use continues to drop off for most of the components of the population beyond 20 nm; therefore, NMFS rates the remaining zones as low based on the very limited usage as displayed in the telemetry data (Tables II-6 and II-7).

III. Impacts to the Steller Sea Lion Prey Field by Pollock, Pacific Cod, and Atka Mackerel Fisheries

In this section we analyze the 1999 and 2002 fishery patterns in order to explain why the revised Steller sea lion conservation measures relieve the impacts that caused jeopardy and adverse modification of critical habitat. For this remand response, NMFS must link the actions that caused jeopardy and adverse modification in the 2000 FMP BiOp to the current conservation measures, and to their effects on Steller sea lion prey availability in the environment. Additionally, since we have data from the fishery in 2002 operating under these measures, it allows us to critique the conservation measures that were implemented to determine whether the fishery performed as expected.

Section 6.4 of the FMP BiOp (page 223) went through an exhaustive analysis of the possible impacts of commercial fisheries on the prey availability for Steller sea lions. Because this document tiers off that programmatic biological opinion, we will not recite that information here. We will, however, review the genesis of the 7 questions and also the origin of the jeopardy and adverse modification decision in order to evaluate the efficacy of the conservation measures in relieving those elements.

A. Overlap between fisheries and Steller sea lions – competition (FMP BiOp)

In the FMP BiOp, section 6.4.2.6, NMFS applied the qualitative criteria developed by Lowry et al. (1982) for determining whether niche overlap was significant with Steller sea lions. To determine the likelihood and relative severity of indirect effects of fisheries on marine mammals, Lowry established criteria based on each marine mammal's diet (with respect to species consumed, size, and composition of prey), feeding strategy, and the importance of the BSAI as a foraging area. This approach was applicable for adjacent waters such as the GOA because many of the same marine mammals found in the BSAI are found in the GOA as well and their diets are comparable. NMFS determined that the western population of Steller sea lions consumed groundfish species as a large part of their diet and did so in areas coincident with Alaska groundfish fisheries.

By the fall of 2000, an extensive body of analytical work on the potential competitive interactions between Steller sea lions and pollock and Atka mackerel fisheries had been assembled (e.g., Loughlin and Merrick 1989; Ferrero and Fritz 1994; Fritz et al. 1995; and Fritz and Ferrero 1998). These fisheries were the obvious starting place for our analyses of interactions because their target species were some of the most prevalent items in the diet of Steller sea lions in the GOA and the BSAI, respectively (NMFS 1998). However, there were many other species targeted by the Alaska groundfish fisheries in the BSAI and the GOA that are also eaten by Steller sea lions. NMFS then needed to explore the critical question of how much overlap occurred. Therefore, NMFS examined the extent to which Steller sea lions rely on the various species of prey in their diet. Next, NMFS investigated whether those important prey items were consumed coincident with the location, timing or pattern of fishery removals.

The following represents the process which NMFS used in the FMP BiOp to determine which fisheries may have adversely affected Steller sea lions and whether or not those effects were likely to jeopardize their continued existence or adversely modify their critical habitat. Seven questions were posed for each FMP managed fish species in the fishery management areas. If question 1 was answered "No," then the answers to questions 2-7 were also "No," so the concern level was nil, thus scoring a "0" total. If Steller sea lions did not eat the targeted fish species, then a competitive interaction would not be likely. If the answer to question 1 was "Yes", it was scored 1 point; the remaining questions 2-6 scored 1 point for a "Yes" and zero points for a "No". If question 7 was yes, it scored 2 points to underscore concern for potential effects of localized depletions.

The seven questions:

1. Do Steller sea lions forage on the target fish species?

2. Do Steller sea lions forage on the target fish species at a rate of at least 10% occurrence?

3. If yes to Number 2, does the size of Steller sea lion prey overlap with the size caught by commercial fisheries?

4. If yes to Number 2,does the fishery overlap spatially with the area used by Steller sea lions to forage on this species?

5. If yes to Number 2, does the fishery operate at the same time Steller sea lions are foraging on the fish species?

6. If yes to Number 2, does the fishery operate at the same depth range that Steller sea lions are using to forage on the fish species?

7. If yes to 1-6, does that fishery operate in a spatially or temporally compressed manner in Steller sea lion critical habitat?

Steller sea lion food habits data in NMFS (1998) and other NMFS data (unpublished data - results of food habits analyses based on Steller sea lion scat collections) were used for this analysis in the FMP BiOp along with the fishery distribution information in Fritz *et al.* (1998); this information combined was used to answer the above questions. Table 4.5 (FMP BiOp) provides a summary of the scat collections data which typify the overall results.

Results of the rating test (FMP BiOp Table 6.6 reprinted here as Table III-1) indicated that nine fishery/Steller sea lion combinations suggested no interactions (i.e., scored "0"), 23 scored "1" or "2" and 5 scored "8", the highest possible score. The fisheries with the high scores were pollock (BSAI and GOA), Pacific cod (BSAI and GOA) and Atka Mackerel (AI). We considered species with scores of 2 or less as having only limited overlap between fisheries and Steller sea lions and would not contribute to jeopardy or adverse modification of critical habitat.

NMFS then concluded that, based on the best scientific and commercial data available at the time, the fisheries as authorized under the FMPs competed with Steller sea lions for common resources. Fisheries and Steller sea lions both targeted pollock, Atka mackerel, and Pacific cod. The high degree of overlap between these fisheries and the foraging needs of Steller sea lions pointed to competitive interactions on a number of scales or axes. However, the potential for local scale competition (localized depletions) could be much larger than the global effects given the large TACs and in some cases, locally small available biomass where fisheries have been observed.

Reducing competitive interaction

When constructing the RPA in the FMP BiOp, NMFS' goal was to reduce the area of overlap and competition between these two "consumers". The first two questions apply only to the foraging habitat of Steller sea lions, and therefore cannot be changed by altering fishery management measures. Questions three and six apply to the physical characteristics of the fishery, size or fish harvested and the depth of the fishery; again neither of these factors could be easily changed. This leaves questions four, five, and seven as the questions for which fishery actions which could reasonably be changed through changes in management; these questions also are the critical aspects of the competitive interaction between sea lions and fisheries.

It is the combination of the findings from analyses of these three factors which led to the jeopardy and adverse modification determination in the FMP BiOp:

1. Fisheries which overlap spatially with the area used by Steller sea lions to forage on pollock, Pacific cod, and Atka mackerel,

2. Fisheries which overlap temporally with Steller sea lions foraging for pollock, Pacific cod, and Atka mackerel, and

3. Fisheries which operate in a spatially or temporally compressed manner in Steller sea lion foraging habitat.

Because the findings from these three analyses all showed reason for concern, NMFS in turn was concerned about impacts of these fisheries on the foraging success of Steller sea lions. In the FMP BiOp, NMFS' data on the first question (spatial overlap) were very crude. This analysis was based primarily on the Platform of Opportunity (POP) data base (FMP BiOp, their Figure 4.2) and the telemetry data (Table II-1). Since 2000, NMFS has had greater success tagging pups and juveniles and had the opportunity to perform the lengthy analyses necessary to interpret the satellite telemetry data. In the 2001 BiOp, NMFS was able to analyze the telemetry data and determine the location of animals inside various zones of critical habitat, a far more detailed analysis than had been done for the FMP BiOp. The pattern that emerged was somewhat surprising to NMFS; it appeared from the data that animals predominately used the 0-10 nm zone. Utilizing this new information, NMFS worked with the action agency through the RPA committee and the Council to develop conservation measures which focused on the removal of spatial overlap between sea lions and the fisheries in order to relax some of the more financially disruptive aspects of the RPA from the FMP BiOp (such as critical habitat catch limits). This could only be done, however, if the overlap was successfully avoided. In essence, if a localized depletion occurred inside critical habitat, but it was outside the area where sea lions foraged, then it would have no effect on the population and would therefore not be an adverse modification of critical habitat. Of course, spatial overlap cannot be entirely eliminated, which is why NMFS and the RPA committee were compelled to use other conservation tools in order to minimize the potential impacts to a level which would not create jeopardy or adverse modification of critical habitat.

B. Fishing patterns inside critical habitat

In section II we reviewed the available information on Steller sea lion foraging habits; now in this section we will describe and evaluate the performance of the fishery and the removal of the spatial overlap between the fishery and Steller sea lion foraging, as well as the other conservation measures which were implemented in an effort to reduce the possibility of localized depletions.

Spatial aspect of the fisheries

Spatial distribution is the key element to the Steller sea lion conservation measures for the pollock, Pacific cod, and Atka mackerel fisheries. In the 2001 BiOp, NMFS attempted to characterize the expected closure areas (their Table 5.3) and the catch in section 5.3.4.5, stating that "because there are virtually no limits on catch in critical habitat . . . it is likely that the majority of the harvest will be concentrated within these zones." To use the analogy of a toothpaste tube, if you squeeze one end of it (such as closures within 0-10 nm) it is inevitable that the toothpaste (or catch) will come out the other end, and in this case be pushed out into the 10-20 nm zone. At the time of the 2001 BiOp, NMFS had no way of guessing how much would be caught within 10-20 nm from rookeries or haulouts, or whether fishermen would elect to fish even further offshore. Now, NMFS is in a position to "Monday morning quarterback" and investigate whether management measures performed as expected.

To answer questions about the location and timing of catch, NMFS developed an extensive catch database for the BSAI and GOA, which is found in Appendix II. Many of the figures and summary tables were developed from these original tables. In this section, a summary can be found in Tables III-2 and III-3. Figures III-1 and III-2 are a graphical representation of the total catch per year and the amount of catch inside Steller sea lion critical habitat from 1991-2002.

In the BSAI, pollock harvest declined to a low amount in critical habitat in 2000, which in part may be due to the critical habitat area closures and catch limits placed on that trawl fishery (Figure III-1; top panel). Since 2000, the catch in critical habitat increased along with the higher overall catch amounts. Since 1998, the BSAI Pacific cod fishery has maintained a level amount of total catchas well as a level of catch removed from critical habitat(Figure III-1; middle panel). The BSAI Atka mackerel fishery went through steep decreases in catch in critical habitat in 1999 through 2000 and has maintained about that same level of catch since then (Figure III-1; bottom panel).

In the GOA, pollock harvest amounts have been decreasing over the last 5 years due to reductions in the overall biomass (Figure III-2; top panel). Catch within critical habitat has shadowed that decline with the majority of catch being removed from critical habitat areas. The Pacific cod biomass has also declined over the past 5 years prompting lower harvest rates (Figure III-2; bottom panel). Pacific cod catch has also been in large part shifted out of critical habitat areas, but not at quite as high a rate as for pollock.

NMFS explored the catch amounts in critical habitat by gear type and management area (BSAI and GOA), and compared these data for the fisheries conducted in 1999 and in 2002. Because of the RPA in place in 2002, the expectation was that many of the fisheries would have experienced reduced nearshore amounts of catch in 2002 when compared to the amounts observed in 1999 (i.e., the fishery that NMFS determined in the FMP BiOp to cause jeopardy and adverse modification). Fisheries that already had extensive closures, such as the BSAI pollock fishery, would probably show less of a change than the BSAI cod hook-&-line fishery which didn't have any sea lion specific closures in 1999. In Figure III-3, the percent of the total catch by each gear type, and in each zone, is displayed from 1998-2002. Table III-4 presents this information as the change from 1999 to 2002 with the rate of change by zone displayed as a percent.

In the GOA (Figure III-4; bottom panel), pollock trawl harvest was virtually eliminated from the 0-3 nm zone, was down about 24% from 1999 in the 10-20 nm zone, reduced 20% in 10-20 nm, and was down overall by 34% in critical habitat(Table III-4). These reductions in catch correlate with what would be expectd based on the extensive closures for GOA trawl fisheries; however, much of the pollock fishery in the first half of the year occurred farther offshore due to low biomass of fish inside the Shelikof foraging area. Therefore it is not clear if the same low catch amounts will continue in the near future in the 10-20 nm zone. For Pacific cod, catch by all gear types was reduced inside the 0-3 nm and 3-10 nm zones. Increases were seen, however, in the 10-20 nm zone, which was expected by NMFS given the size of area open to the fleet in the 10-20 nm zone. Also, as part of the conservation measures, much of the 0-10 nm area was closed to Pacific cod fisheries, which effectively forced them to fish in the 10-20 nm zone. However, Pacific cod hook-&-line fisheries caught less of their catch inside all zones of critical habitat

(Table III-4).

In the BSAI, catch by all three target fisheries and all gear types was reduced in both the 0-3 nm zone and the 3-10 nm zone except for pollock (Table III-4). Pollock trawl harvest in the 3-10 nm zone was higher in 2002 than in 1999 despite closures out to 10 nm in the EBS, with the exception of St. George Island which had only 3 nm closures from Dalnoi Pt. and South Rookery. Catch at St. George was up substantially. Although the table is listed as BSAI catch, because there was no fishery for pollock in the Aleutians this catch is actually just reflective of the EBS. Catch was up by 255% in the 10-20 nm zone in the EBS, which again was expected given the conservation strategy of closing the 0-10 nm area, thereby displacing harvest into the 10-20 nm zone for vessels which prefer to fish close to shore. Overall, the catch in critical habitat (including the foraging area) was up by 49% in 2002 compared to 1999. Both Pacific cod trawl and Atka mackerel were up in the 10-20 nm zone (Table III-4), but were either down or unchanged overall in critical habitat. Pacific cod pot and hook-&-line harvests were both down in all areas of critical habitat, down 18% and 34% respectively.

However, when looking at trends over the last 5 years (Figure III-3), catch in critical habitat in the Pacific cod pot fisheries have been variable. Therefore, in some cases, it is difficult to make comparisons across two years because of the inter-annual variation of catch based on changes in the location of spawning aggregations of fish and other factors such as weather and changes in other regulations. So, although our task is to compare the 1999 fishery to the 2002 fishery, in some cases we need to look at longer time periods to understand the trends in order to accurately characterize the changes that have or have not occurred.

Temporal aspect of the fisheries

One of the important issues that NMFS considered when implementing the conservation measures was the need to temporally distribute fisheries to avoid locally concentrated catches that could result in localized depletions of Steller sea lion prey. A component of these measures was the implementation of seasonal harvest limits for pollock, Pacific cod, and Atka mackerel. Additional changes to the measures that were in place in 1999 are seasonal apportionments for Pacific cod and the use of fishery groups (or "platoons") for Atka mackerel. In this section NMFS will explore the changes to the fishery after implementation of these conservation measures intended to temporally distribute the fishing effort.

Figures III-4,5, and 6 depict the percentage of annual catch by each fishery harvested by quarter of the year. For the BSAI Pacific cod trawl fishery, about 65-70% of the annual catch has been taken from the first 3 months of the year (Figure III-4; top panel). Harvest limits are listed in Table I-8. When looking at the fishery by quarter, very little effect of implementing regulations can be seen in the temporal catch distributions. The Pacific cod pot fishery (middle panel) occurs between March and April, which is why the fishery has shown up under the second quarter (1998 and 1999) or the first quarter (2000-2002). In 2002, about 70% of the fishery occurred in the first quarter, compared to about 5% in 1999. For the Pacific cod hook-&-line fishery, about 49% of the catch was taken in the first quarter in 2002 compared to 51% in 1999; again, as with the trawl fishery, little change is evident with the conservation measures in place.

In the GOA (Figure III-5), the Pacific cod trawl fishery catch has been variable in the first quarter fluctuating between 30-70% of the annual catch. The conservation measures limit the catch to 60% in the first half of the year (Table I-8); in 2002 about 58% was taken in the first quarter and about 18% in the second quarter. However, this doesn't factor in forgone TAC which may not have been caught in the first season. Pacific cod pot catch was erratic over the 5 years, with slightly more catch in the first quarter in

2002 than in 1999, but quite a bit less than the 95% which was taken in 2000. Pacific cod hook-&-line catch was about 75% in the first quarter, down from the previous two years (90-95%), but up from 1999 (30%).

Seasonal catch of pollock in the BSAI and GOA is displayed in Figure III-6. In the BSAI, catch had been slowly decreasing in the first quarter from 1998-2001 (from about 48% to 38%) with a small increase in 2002 up to just over 40%. Most of the catch in the second half of the year occurs in the third quarter (from July - September) with a decreasing amount being taken in the fourth quarter. Pollock catch in the GOA has been more variable by season than in the BSAI (Figure III-6; bottom panel). In 2002 the GOA catch in the first half of the year was about 42%, just above the amount in 1999 (39%). Catch was more evenly dispersed in the second half of the year between the third and fourth quarters.

One of the more interesting conservation measures was the change in seasonal management of the Atka mackerel fisheries. This fishery already had a 50/50 apportionment between the first and second halves of the year before changes were implemented as a result of the 2001 BiOp measures. Because of the relatively few vessels participating in the fishery, NMFS was able to implement management measures to divide the fleet into two groups (or "platoons" as described by the fishermen). These platoons would be divided between area 542 and 543 in the Aleutian Islands for the fishery occurring in critical habitat. Table III-5 presents the average catch per day in 2001 and 2002 as well as the maximum daily rate observed in the fishery. On average, the platoons reduced the 2002 average catch rate per day to about 70% of the 2001 value (range 49%-88%; roughly a 30% reduction). Maximum daily catch rates were also reduced by the same amounts (range 61%-77%). Although the goal was a 50% reduction in rates, platoon management appeared to be a success with substantial reductions in catch rates in critical habitat.

Catch that has been displaced by the conservation measures

Another aspect of the conservation measures that we explored was the level of fishing that had actually been prohibited under the 2002 conservation measures. We compared harvests in 1991, 1998, and 1999 in critical habitat, for each fishery, and calculated the catch levels that would have been foregone had the 2002 RPA-dictated fishing patterns occurred in those three years. That is, with the 2002 RPA in place in 1991, the overall 1991 catch would have been reduced...but how much of this reduction would have occurred in sea lion critical habitat? In essence, if little fishery catch was displaced from critical habitat, but large closures were implemented, this would indicate that areas were closed where the fishery did not occur, and that the closures were of little help to avoid the problems leading to jeopardy and adverse modification.

Appendix 3 was developed to investigate how "traditional" fishing grounds occupied by the fleet over the past decade may have been impacted by the current protection measures. We compared the historic catch locations in 1991 (before any sea lion conservation measures such as rookery trawl closures had been implemented), in 1998 (before any RPA management measures), and in 1999 (under conservation measures for pollock and Atka mackerel, but none specifically for Pacific cod). Table III-6 is a summary table of the displaced catch by gear type and area.

It is clear that the fishery occurred fairly close to shore in sea lion critical habitat in 1991 as shown by the highest average displacements (Table III-6). About 19% of the 1991 Pacific cod fishery locations would be prohibited today, as well as 32% of the pollock fishery and 90% of the Atka mackerel fishery. By 1999, these numbers are reduced substantially as we would expect due to a series of sea lion related closures which forced the fishery further offshore. This analysis shows that since 1991, NMFS has implemented a substantial amount of area closures around sea lion rookeries and haulouts for the Atka mackerel and pollock fisheries.

For the Pacific cod fishery in 1999, the most substantial closures were for the fisheries for GOA pot gear (20%) and trawl gear (19%), and Aleutian Islands pot gear (29%) and trawl gear (32%). Noticeably, EBS trawl fisheries were only displaced by 4% from 1999, and EBS hook-&-line fisheries were displaced by 2%. This indicates that the conservation measures implemented after the 2001 BiOp moved 4% of the EBS trawl Pacific cod fishery away from sea lion foraging areas. In other words, this analysis shows that 4% of the EBS trawl tows were problematic and caused jeopardy and adverse modification.

The pollock trawl fishery has an extensive history of Steller sea lion protection closures beginning in 1992 with the first rookery closures. In 1999, NMFS implemented 10 nm closures around most rookeries and haulouts in the GOA and 20 nm closures in the EBS, as well as a complete fishery closure in the Aleutian Islands. Under the 2002 measures, closure zones are actually smaller in the EBS and larger in some areas of the GOA. For the GOA, in 1998 52% of the fishery would have been displaced, but because many new 10 nm closure areas were implemented in 1999, only 10% of the 1999 fishery would have been displaced. So between 1998 and 1999 about 40% of the fishery had already moved to locations farther offshore. From 1999 to 2002, about 10% of this fishery was altered to avoid jeopardy and adverse modification. In comparison, only 1% of the EBS pollock fishery would have been displaced in either years. Again, this is primarily a function of the fact that closures had already been implemented in this region, and that the 2002 closure areas were scaled back from 20 nm in 1999 to generally 10 nm in 2002. The Aleutian Islands displacement amount is misleading because since 1999 there has been no directed fishery (bycatch only for pollock); therefore the value represents only bycatch hauls and is misleading. In actuality, the directed fishery has been closed.

The Atka mackerel fishery had also been impacted by the rookery closures between 1992 and 1998, which is evident in the fact that 89% of the historic fishery in 1991 would have been displaced by the current conservation measures. This indicates that most of the productive fishing grounds, at least those that were productive and profitable in 1991, have been closed to the fishery, forcing them to fish in other, presumably less productive or more costly areas. Of the fishery in 1999, about 18% of it would have been displaced. Again, this is consistent with our expectations due to the increased amount of inshore closures with the relaxation of some of the 20 nm buffers that were previously in place. For the EBS, trawling for Atka mackerel has been very minimal, and the few hauls that occurred there were in areas that are now closed.

In summary, for some fisheries there have been few significant changes because of implementation of the closure areas (i.e., EBS hook-&-line fishery for Pacific cod 2%) while other fisheries, such as the Aleutian Islands trawl fishery for Pacific cod, were displaced by as much as 32%.

C. Possible effects of fishing removals on the prey field for Steller sea lions

In order to evaluate the possible effects of fishing on Steller sea lions, we need to understand the possible changes in the prey field which may result from fishing. Unfortunately, this is one of the most difficult analyses to conduct given the lack of data on the spatial and temporal distribution of fish biomass. In most cases we have only one survey of fish biomass conducted per year, usually during summer, for some species we have two surveys for other species surveys are only done every two or three years. The possible changes to the prey field that may occur due to fisheries, and the mechanisms for these changes, were qualitatively explored in the FMP BiOp (section 6.4; page 223). For this remand response we will explore the scientific information available to describe fisheries effects on the prey field.

In an effort to describe the possible physical effects of the fisheries on the prey field for Steller sea lions, NMFS developed a series of tables (Tables III-7a through f) which display: (1) catch data from the fishery in 1999 and 2002, (2) the biomass of sea lion prey species in zones of critical habitat, and (3) the harvest rate by each zone and season. Each table represents a specific fishery and management region, with two seasonal splits (winter/spring and summer/fall). The top line of each table is the biomass proportion which is the percentage of the total prey biomass in each management area estimated to be in each individual zone. For example, in Table III-7a, for the January - June season, 30% of the GOA pollock biomass is estimated to be inside 0-10 nm of listed rookeries and haulouts. Following down that column of the table, 9,800 mt were caught inside 0-10 nm in 1999 and 900 mt in 2002 in the first season. During that time, we have estimated 205,900 mt of pollock biomass inside 0-10 nm in 1999, and 200,100 mt in 2002. The harvest rate, which is merely the catch divided by the biomass, was 4.8% in 1999 and 0.4% in 2002. To relate this harvest rate back to the annual harvest rate, we would expect that for any particular half of the year, the harvest rate for any zone should also be about half of the annual harvest rate (i.e., spreading that annual harvest rate over the year results in lower harvest rates per smaller time period). So, if the annual harvest rate is 10% for example, then we would expect the first season rate not to exceed 5% (assuming the TAC was apportioned 50% to each season).

Below, we walk through each table to evaluate the change in harvest rates by area in order to determine if the harvest rates within 0-10 nm were decreased as was intended, and whether the remaining rates within critical habitat are about the same as the annual rate (as appropriate by season and area).

GOA pollock: Table III-7a

The overall estimated harvest rate for GOA pollock was much lower in 2002 than 1999, down from 14.1% to 7.9% (Table III-7a). This large reduction in the harvest rate was a result of continuous biomass declines and uncertainty about the stock in the GOA and the application of a more conservative harvest strategy. The GOA pollock stock has been declining for numerous years (Dorn et al. 2002). Continued lack of productivity in this stock, and uncertainty around the accuracy of current surveys as an indicator of biomass, has caused concern among the GOA Groundfish Plan Team and the SSC. The most recent surveys have shown steep declines in biomass which may be indicative of biomass declines or possibly changes in the distribution of the species. The stock is currently at 28% of the theoretical unfished biomass.

The conservation strategy for GOA pollock was to distribute the harvest evenly throughout the year. The harvest rate during the first half of the year in 2002 was 3.4%, less than half of the annual rate of 7.9%. The other change NMFS sought was a decreased harvest rate inside the 0-10 nm zone. In the first half of the year (January-June), the rate dropped from 4.8% to 0.4%, which is a large reduction from 1999 rate and from the annual rate in 2002 (7.9%). The reduction was also seen in the 10-20 nm zone (from 12% to 2.2%) and in the Shelikof Strait foraging area (15.3% to 3.7%). These same patterns were also found in the second half of the year (July-December), except for the 10-20 nm zone which was about the same from 1999 to 2002. Overall, the critical habitat catch rate was down from 14.3% to 5.3%. The result is that the 2002 fishing pattern reduces the chances for localized depletions of pollock in the GOA. With roughly a third of the harvest rate in critical habitat areas, the impacts that were potentially possible (FMP BiOp) are much less likely now under the 2001 BiOp.

GOA Pacific cod: Table III-7b

The overall harvest rate for GOA Pacific cod was lower in 2002 than in 1999, down from 11% to 9.3% (Table III-7b). In general, catch rates between 1991 and 2002 decreased in the winter and increased in the summer. This was one of the goals of the conservation plan and the implementation of seasonal harvest limitations for GOA Pacific cod. The winter rate was down from 7.9% to 4.9% in critical habitat, and up from 1.1% to 3.2% in the summer; however, each of these rates is below or in line with the target rate which would be about half of the annual rate (4.7%).

EBS pollock: Table III-7c

The overall harvest rate for EBS pollock was higher in 2002 than in 1999, up from 9.1% to 13.3% (Table III-7c). In general, harvest rates increased in critical habitat from 1999 to 2002, especially in the foraging area, up from 7% in critical habitat in 1999 to 15.2% in 2002. Given that the overall annual harvest rate was 13.3% in 2002, we would expect the winter harvest rate to be 40% of this, or 5.3% and a summer harvest rate to be 60% of the annual, or 8% (given the 40/60 seasonal apportionment for EBS pollock). Winter harvest in critical habitat was 6.6% (just over the 5.3% target) and the summer was 15.1% (double the summer target rate). In the winter, the harvest rate increased from 0.1% to 0.3% in the 0-10 nm zone (likely due to fishing around St. George Island); increased from 0.9% to 4.7% in the 10-20 nm zone (due to the decreased closure areas in the EBS from 20 nm to 10 nm around rookeries and haulouts); and increased from 8.6% to 11% in the foraging area. In the summer, the harvest rate increased from 0.1% to 1.5% in the 0-10 nm zone; increased from 2.3% to 13% in the 10-20 nm zone (double the target rate of 8%); and increased from 9.5% to 24% in the foraging area (triple the target harvest rate).

BSAI Pacific cod: Table III-7d

The overall harvest rate for BSAI Pacific cod was slightly higher in 2002 than in 1999, up from 13.7% to 14.9% (Table III-7d). Again, we see a reduction in the harvest rate inside the 0-10 nm zone, down from 10% in 1999 to 5.6% in 2002 which was the same pattern for both the summer and winter. Harvest rates in the 10-20 nm zone were about equal from 1999 to 2002 as were the rates in critical habitat (from 13% to 12.2%). No seasonal change was evident from this data set with a 10.4% harvest rate in the winter in 1999 and 9.8% in 2002. Given the change to seasonal harvest limits we would have expected more of a decrease in this harvest rate if more of the harvest were being taken in the summer.

Aleutian Island Atka mackerel: Table III-7e

The overall harvest rate for Aleutian Islands Atka mackerel fishery was slightly higher in 2002 than in 1999, up from 9.6% to 11.7% (Table III-7e). In general, the Atka mackerel fishery performed as expected under the conservation measures. For example, more inshore closures and reduced offshore closures resulted in harvest rates which were down in the 0-10 nm zone (from 4.3% to 1.2%); up in the 10-20 nm zone (from 11% to 14.9%); and about equal in critical habitat overall (from 7.7% to 8.3%). The harvest rates outside of critical habitat were up from 13.3% in 1999 to 18.6% in 2002, indicating the response of the fleet to inshore closures, harvest limits, and platoon management - the fleet fished farther offshore where there were fewer restrictions. With this data set we can also see the seasonal limits - harvest rates in the first half of the year were about half of the annual rate.

BSAI and GOA Pacific cod, pollock, and Atka mackerel: Table III-7f

For this table we combined all three species across all areas to summarize the overall changes from 1999 to 2002 under the Steller sea lion conservation measures. It is important to mention as a caveat that the large biomass and catch of EBS pollock dominates this table as all the other fisheries are much smaller in comparison. Overall, the harvest rate increased from 1999 to 2002, up from 9.9% to 13%. Harvest rates were down slightly overall in the 0-10 nm from 3.4% in 1999 to 2.3% which is smaller than we might have expected given the closure strategy for the within-10 nm zone. Harvest rate was up in the 10-20 nm zone from 6% in 1999 to 11.8% in 2002, yet this is still below the annual harvest rate of 13%. Catch in the foraging areas also increased from 14.3% in 1999 to 22.5% in 2002, about 70% above the annual harvest rate. The harvest rate in critical habitat increased from 8.2% in 1999 to 13.5% in 2002 which includes catch in the foraging areas. This is indicative of the conservation measures which were implemented: more closures within 0-10 nm and the general relaxation of closures from 10-20 nm. In the summer, rates increased from 2.7% in the 10-20 nm zone to 9.7% in 2002; from 9.3% to 21.5% in the foraging areas; and 4.3% to 11.2% in critical habitat overall. However, overall harvest rates inside critical habitat areas were below the annual rate with a few exceptions (e.g., summer in the 10-20 nm zone and in the foraging areas).

D. Experiments on fisheries effects on prey availability for Steller sea lions

Over the last three years NMFS has conducted numerous scientific research projects in order to understand the mechanisms that may contribute to localized depletions of prey for Steller sea lions. This has involved three experiments; (1) Atka mackerel movement and abundance experiments in the Seguam pass area in the Aleutian Islands, (2) pollock localized depletion experiments in the Kodiak area, and (3) Pacific cod tagging and localized depletion experiments in the Unimak pass area. These studies are either in their first stages of research or only preliminary results are available.

Background

A reduction in prey availability for Steller sea lions may result from a reduction in prey abundance and/or a disruption in their spatial patterns. The extent of the effects to the prey field could determine the impact on the foraging success of a foraging Steller sea lion. Fishing removals may cause a decline in the abundance of a prey species within a localized area, but recovery to pre-fishery levels may be so quick that impacts to predator foraging success would be negligible. Alternatively, disturbances from fishing operations may elicit longer-term behavioral responses by prey species that might affect spatial patterns and impact Steller sea lion foraging behaviors (Wilson et al., in review). Disturbed fish might have a variety of reactions, such as moving deeper in the water column to form smaller, denser aggregations, or dispersing and becoming more fragmented, which may adversely impact the foraging behavior of Steller sea lions. Unfortunately, few data are available to definitively show whether commercial fishing activities affect the distribution and abundance of Steller sea lion prey species. The following describes three studies that are examining fishery effects on fish distribution and abundance.

Pollock

The primary goal of the pollock study, which was conducted near Kodiak Island in the Chiniak and Barnabas troughs, was to investigate whether commercial fishing could cause measurable changes in spatial patterns (i.e., vertical distribution, fish school characteristics) and abundance in the walleye pollock population in these locations at scales relevant to foraging sea lions (Wilson et al., in review). In a recently submitted paper, NMFS reports results from their first 2 years of field study. The aim of this research was to characterize the effects of commercial fishing activity on the distribution and abundance of walleye pollock (Theragra chalcogramma) over short spatio-temporal scales of days to weeks. The work forms part of a larger research effort designed to determine whether commercial fishing activities impact the prey availability of walleye pollock and other forage fish species (e.g., capelin).

Wilson et al. (in review) reports that the biomass and distribution of pollock were stable over periods of days to weeks although during the second year they found an unusual, extremely dense, small-scale pollock aggregation which was detected during one of several survey passes. Results from the second year, when the commercial fishery took place within the study area, did not suggest a significant link between fishing activities and changes in estimates of juvenile and adult pollock geographical distribution, biomass, and vertical distribution. However, they also state that "the high degree of variability between passes, precluded detection of a fishing effect. However, when the biomass estimates were averaged before and during the fishery, there appeared to be a decline that would be consistent with observed fishery removals." This is consistent with our review of the data, where between pass 1(pre fishery) and 2, the estimate of pollock biomass went from 12,700 mt to 4,800 mt, which calls into question the ability of this technology to detect localized depletions of prey, or other changes which may influence the foraging success of Steller sea lions. Additionally, the fishery which occurred in Barnabas trough caught 2,850 mt, which equates to a harvest rate of about 33% (catch divided by biomass, not adjusted by the seasonal fraction). Given that this fishery occurred only over one quarter of the year (and one quarter of the TAC) we would have expected the harvest rate to be more on the order of 3-4%. Overall, the results from this experiment are preliminary and incomplete due to unresolved issues associated with survey detection technology and study design, and logistical difficulties with the timing of the fishery.

Atka mackerel

The purpose of this project was to use fish tagging methods to estimate local abundance and small scale movement of Atka mackerel around Steller sea lion rookeries and to examine potential fishery effects on Atka mackerel movement and abundance.

During August 1999, NMFS, in cooperation with the School of Fisheries and Aquatic Sciences at the University of Washington, conducted a tagging feasibility study as part of a trawl survey in Seguam Pass in the Aleutian Islands. The results of the feasibility study showed that the tagged fish survived well and that the fishery was able to capture tagged fish. In July-August 2000 a full-scale tag/recapture study was conducted in the same area as the pilot project. Fish were caught, tagged, and released in two dedicated areas which were inside and outside the trawl exclusion zone. Tagged fish were recovered by the fishing fleet with the help of biological observers during their regular fishing activities in the area open to the fishery. In the area closed to the fishery a fishing vessel was chartered by NMFS to recover tagged Atka mackerel.

Using the 2000 data, the estimated movement rate of tagged Atka mackerel from inside to outside the trawl exclusion zone was less than 1% after 59 days, a period which spans the time the fishery occurred in September. Estimated movement rate was much larger for fish moving from the open area to the closed area - 60% of the population. However, the recovery effort inside the closed area was much smaller so there is a high degree of uncertainty around the estimate of movement rate into the closed area – the 95% confidence bounds included zero and one hundred percent probability of movement. These results suggest that there is relatively little movement of Atka mackerel from inside to outside the trawl exclusion zones, indicating that trawl exclusion zones are effective at protecting Atka mackerel near Steller sea lion rookeries around Seguam Pass. Caution should be used in applying these results to other areas, each with resident Atka mackerel populations and fisheries of different size and distribution.

Pacific cod

Pacific cod experiments near Unimak Pass began in 2002 for the purpose of investigating the impacts of commercial fisheries on Steller sea lion prey. To date, NMFS has performed various feasibility studies in this area, and will be conducting experiments using commercial fisheries to determine if impacts can be detected on the prey field in the EBS. Some of the preliminary tagging data indicates that Pacific cod can travel long distances in the EBS over relatively short periods of time, which is consistent with work conducted by Shimada and Kimura (1994). However, many of the tagged fish remained within sea lion critical habitat for a period of 90-120 days after tagging (i.e., from April - August)(Elizabeth Conners, pers. comm.).

E. Steller sea lion foraging requirements in critical habitat

There is little information available on the foraging requirements of Steller sea lions; however, a number of projects are underway which will be looking closer at this important aspect of Steller sea lion conservation. At this date ,however, the best information available is the analysis that was presented in the 2001 BiOp in Section 5.3.3. In that analysis, NMFS investigated the amount of biomass available by area in the EBS, AI, and GOA and the amount of prey the local populations of Steller sea lions may require. A number of assumptions were made in the analysis and the reader should review Section 5.3.3. of the 2001 BiOp for the details of that exercise.

The forage ratio for the Eastern Bering Sea (Table III-8 below reprinted from the 2001 BiOp) is much higher than the ratio for a "healthy" stock of Steller sea lions foraging on a theoretical, unfished groundfish population (446 compared to 46 for the "healthy" case). The forage ratios for the GOA and AI are substantially lower than the EBS and are also below the "healthy" range. Interpretation of these ratios is not straightforward, as Steller sea lions forage on species other than pollock, Pacific cod, and Atka mackerel in these areas. This information does indicate that fisheries effects are more likely in the AI and the GOA than in the EBS, but is insufficient to determine whether fisheries are competing with sea lions.

F. Is the edge effect significant?

In the 2001 BiOp, NMFS explored the issue of the edge effect in section 5.3.1.7. NMFS originally brought this issue to light in the 1998 BiOp as a concern about the concentrated fisheries in the EBS near Sea Lion Rocks (Amak Island) and in the foraging area. The question is whether effects of fishing along the edge of a closure zone (e.g., a 10 nm closure zone) would be found on the prey field within that zone. For example, if fish are moving along the coast, entering an area around a haulout that is closed, those fish could in theory be intercepted by the fishery and therefore reduce the availability of prey within a zone in which they never fished; this concept can be compared to a downstream effect.

The information that NMFS has collected over the last 4-5 years since the 1998 BiOp indicates that closure areas are robust and that these downstream effects or edge effects are unlikely and have not been detected. The Atka mackerel research has shown the Seguam buffer to be robust as Atka mackerel appear to be very local (i.e., they do not migrate outside of the buffer zones), and therefore fishing outside of the closure area would not affect the prey field inside (see section III(D) above). The pollock experiments also indicated that the impacts on the structure and location of pollock biomass by the fisheries was not significant enough to allow detection by NMFS surveys (section III(D)). The Pacific cod experiments are just underway, yet initial results show substantial movement throughout the EBS which casts doubt on whether fishery impacts would be long lived on any small scale such as a few miles across a closure zone boundary. In summary, NMFS has conducted a suite of studies on pollock, Pacific cod, and Atka mackerel, and none of the information supports the hypothesis that an edge effect might adversely affect the foraging success of Steller sea lions. However, our information on the pollock fishery is only preliminary and is not conclusive about the edge effect issue. The Pacific cod experiments are only in the test phase, so little can as yet be gleaned from that work. It is likely that any edge effect issues are going to be on a small scale, such as around specific rookeries or haulouts.

IV. How the Steller Sea Lion Conservation Measures Avoid Jeopardy and Adverse Modification

This section has not been completed. It will provide a summary and evaluation of the information in sections I-III and evaluate whether the Steller sea lion conservation measures avoided jeopardy and adverse modification. Pending comment on sections I-III, this section will be completed.

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Table I-1 Counts of adult and juvenile (non-pup) Steller sea lions at rookery and haulout trend sites by region (Sease and Gudmundson in review). For the GOA, the eastern sector includes rookeries from Seal Rocks in Prince William Sound to Outer Island; the central sector extends from Sugarloaf and Marmot Islands to Chowiet Island; and the western sector extends from Atkins Island to Clubbing Rocks. For the Aleutian Islands, the eastern sector includes rookeries from Sea Lion Rock (near Amak Island) to Adugak Island; the central sector extends from Yunaska Island to Kiska Island; and the western sector extends from Buldir Island to Attu Island.

Year	Gulf of Alaska			Aleutian Islands			Kenia to Kiska	Western DPS US	Western DPS Russian	Southeast Alaska
	Eastern (n=10)	Central (n=15)	Western (n=9)	Eastern (n=11)	Central (n=35)	Western (n=4)	(n=70)	(n=84)	(n=)	(n=10)
1975				19,769						
1976	7,053	24,678	8,311	19,743						
1977				19,195						
1979					36,632	14,011				6,376
1982										6,898
1985		19,002	6,275	7,505	23,042					
1989	7,241	8,552	3,800	3,032	7,572					8,471
1990	5,444	7,050	3,915	3,801	7,988	2,327				7,629
1991	4,596	6,270	3,732	4,228	7,496	3,083	21,726	29,405		7,715
1992	3,738	5,739	3,716	4,839	6,398	2,869	20,692	27,299		7,558
1994	3,365	4,516	3,981	4,419	5,820	2,035	18,736	24,136		8,826
1996	2,132	3,913	3,739	4,715	5,524	2,187	17,891	22,210		8,231
1997		3,352	3,633							
1998		3,467	3,360	3,841	5,749	1,911	16,417	20,438[1]		8,693
1999	2,110									
2000	1,975	3,180	2,840	3,840	5,419	1,071	15,279	18,325		9,862
2002	2,500	3,366	3,221	3,956	5,480	817	16,023	19,340		9,951[2]

[1] 1999 counts substituted for sites in the eastern Gulf of Alaska not surveyed in 1998.

[2] 2002 counts for Southeast Alaska are preliminary.

Table I-2 Trends in sub-populations of Steller sea lions from 1991 to 2002 (Sease and Gudmundson in review).

	Gulf of Alaska			Aleutian Islands					
Year	Eastern (n=10)	Central (n=15)	Western (n=9)	Eastern (n=11)	Central (n=35)	Western (n=4)	Kenai to Kiska (n=70)	Western DPS (n=84)	Southeast Alaska (n=10)
% change 1991 to 2002	- 45.6	- 46.3	- 13.7	- 6.5	- 26.9	- 73.5	- 26.26	- 34.24	+ 15.4
% change 2000 to 2002	+ 26.6	+ 5.8	+ 13.4	+ 2.9	+ 1.1	- 23.7	+ 4.85	+ 5.52	+ 0.9
est. annual % change 1991 to 2002	- 7.0	- 6.3	- 2.2	- 1.6	- 2.3	- 11.4	- 3.09	- 4.15	+ 1.8

Table I-3 Counts of Steller sea lions on St. George Island from 1997-2002. Counts were taken from land at opportune times and were not a part of a systematic observation program (Kent Sundseth, pers. comm.).

Date	# of animals	Location
1/24/1998	83	Dalnoi Point
3/3/2001	7	Dalnoi Point
3/30/2001	25	Dalnoi Point
2/17/2002	200	Dalnoi Point
3/5/2002	48	Dalnoi Point
8/11/2000	3	East Cliffs
7/22/2001	51	East Reef
6/12/1999	35	Murre Rock
9/8/2001	37	Tolstoi Point
3/5/2002	8	Tolstoi Point
12/16/1997	1	Zapadni Beach
7/17/1999	1	Zapadni Rookery

Table I-4 Regional counts of Steller sea lion pups at rookeries in Alaska from 1990/1991 to 2002, including overall percent change from earlier years and estimated annual rates of change from 1991 to 2001/2002. The composite ount for 2001/2002 includes pup counts from 7 rookeries in 2001 (Sease and Gudmundson in review).

	Gulf of Alaska			Aleutian Islands			Kenai to Kiska	Southeast Alaska
Count year(s)	Eastern (n=2)	Central (n=5)	Western (n=4)	Eastern[1] (n=5)	Central[2] (n=11)	Western (n=4)	(n=25)	(n=3)
1990/1991		4801	1857	2075	3568		12301	3600
1994	903	2831	1662	1776	3109		9378	3770
1996	584							3714
1997	610					979		4160
1998	689	1876	1493	1474	2834	803	7677	4234
2001/2002	570	1543	1575	1385	2577	488	7080	4706
Percent change								
1990 to 2001/2002		-67.9%	-15.2%	-33.3%	-27.8%		-42.4%	+30.7
1994 to 2001/2002	-36.9%	-45.5%	-5.2%	-22.0%	-17.1%		-24.5%	+24.8
1998 to 2001/2002	-17.3%	-17.8%	-5.5%	-6.0%	-9.1%	-39.2%	-7.8%	+11.1
est. annual % change 1994 to 2002	-4.7	-8.1	-0.8	-3.3	-2.5	-15.1	-3.8	+3.3

[1] Does not include Sea Lion Rocks (Amak) or Ogchul.

[2] Does not include Semisopochnoi, Amchitka-East Cape, or Amlia-Sviechnikof Harbor.

Table I-5 Table 4 to 50 CFR Part 679, Steller Sea Lion Protection Areas Pollock Fisheries Restrictions.

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pollock No-fishing Zones for Trawl Gear [2,8](nm)
		Latitude	Longitude	Latitude	Longitude	
St. Lawrence I./S Punuk I.	Bering Sea	63 04.00 N	168 51.00 W			20
St. Lawrence I./SW Cape	Bering Sea	63 18.00 N	171 26.00 W			20
Hall I.	Bering Sea	60 37.00 N	173 00.00 W			20
St. Paul I./Sea Lion Rock	Bering Sea	57 06.00 N	170 17.50 W			3
St. Paul I./NE Pt.	Bering Sea	57 15.00 N	170 06.50 W			3
Walrus I. (Pribilofs)	Bering Sea	57 11.00 N	169 56.00 W			10
St. George I./Dalnoi Pt.	Bering Sea	56 36.00 N	169 46.00 W			3
St. George I./S Rookery	Bering Sea	56 33.50 N	169 40.00 W			3
Cape Newenham	Bering Sea	58 39.00 N	162 10.50 W			20
Round (Walrus Islands)	Bering Sea	58 36.00 N	159 58.00 W			20
Attu I./Cape Wrangell	Aleutian I.	52 54.60 N	172 27.90 E	52 55.40 N	172 27.20 E	20
Agattu I./Gillon Pt.	Aleutian I.	52 24.13 N	173 21.31 E			20
Attu I./Chirikof Pt.	Aleutian I.	52 49.75 N	173 26.00 E			20
Agattu I./Cape Sabak	Aleutian I.	52 22.50 N	173 43.30 E	52 21.80 N	173 41.40 E	20
Alaid I.	Aleutian I.	52 46.50 N	173 51.50 E	52 45.00 N	173 56.50 E	20
Shemya I.	Aleutian I.	52 44.00 N	174 08.70 E			20
Buldir I.	Aleutian I.	52 20.25 N	175 54.03 E	52 20.38 N	175 53.85 E	20
Kiska I./Cape St. Stephen	Aleutian I.	51 52.50 N	177 12.70 E	51 53.50 N	177 12.00 E	20
Kiska I./Sobaka & Vega	Aleutian I.	51 49.50 N	177 19.00 E	51 48.50 N	177 20.50 E	20
Kiska I./Lief Cove	Aleutian I.	51 57.16 N	177 20.41 E	51 57.24 N	177 20.53 E	20
Kiska I./Sirius Pt.	Aleutian I.	52 08.50 N	177 36.50 E			20
Tanadak I. (Kiska)	Aleutian I.	51 56.80 N	177 46.80 E			20
Segula I.	Aleutian I.	51 59.90 N	178 05.80 E	52 03.06 N	178 08.80 E	20
Ayugadak Point	Aleutian I.	51 45.36 N	178 24.30 E			20
Rat I./Krysi Pt.	Aleutian I.	51 49.98 N	178 12.35 E			20
Little Sitkin I.	Aleutian I.	51 59.30 N	178 29.80 E			20

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pollock No-fishing Zones for Trawl Gear [2,8](nm)
		Latitude	Longitude	Latitude	Longitude	
Amchitka I./Column Rocks	Aleutian I.	51 32.32 N	178 49.28 E			20
Amchitka I./East Cape	Aleutian I.	51 22.26 N	179 27.93 E	51 22.00 N	179 27.00 E	20
Amchitka I./Cape Ivakin	Aleutian I.	51 24.46 N	179 24.21 E			20
Semisopochnoi/Petrel Pt.	Aleutian I.	52 01.40 N	179 36.90 E	52 01.50 N	179 39.00 E	20
Semisopochnoi I./Pochnoi Pt.	Aleutian I.	51 57.30 N	179 46.00 E			20
Amatignak I. Nitrof Pt.	Aleutian I.	51 13.00 N	179 07.80 W			20
Unalga & Dinkum Rocks	Aleutian I.	51 33.67 N	179 04.25 W	51 35.09 N	179 03.66 W	20
Ulak I./Hasgox Pt.	Aleutian I.	51 18.90 N	178 58.90 W	51 18.70 N	178 59.60 W	20
Kavalga I.	Aleutian I.	51 34.50 N	178 51.73 W	51 34.50 N	178 49.50 W	20
Tag I.	Aleutian I.	51 33.50 N	178 34.50 W			20
Ugidak I.	Aleutian I.	51 34.95 N	178 30.45 W			20
Gramp Rock	Aleutian I.	51 28.87 N	178 20.58 W			20
Tanaga I./Bumpy Pt.	Aleutian I.	51 55.00 N	177 58.50 W	51 55.00 N	177 57.10 W	20
Bobrof I.	Aleutian I.	51 54.00 N	177 27.00 W			20
Kanaga I./Ship Rock	Aleutian I.	51 46.70 N	177 20.72 W			20
Kanaga I./North Cape	Aleutian I.	51 56.50 N	177 09.00 W			20
Adak I.	Aleutian I.	51 35.50 N	176 57.10 W	51 37.40 N	176 59.60 W	20
Little Tanaga Strait	Aleutian I.	51 49.09 N	176 13.90 W			20
Great Sitkin I.	Aleutian I.	52 06.00 N	176 10.50 W	52 06.60 N	176 07.00 W	20
Anagaksik I.	Aleutian I.	51 50.86 N	175 53.00 W			20
Kasatochi I.	Aleutian I.	52 11.11 N	175 31.00 W			20
Atka I./North Cape	Aleutian I.	52 24.20 N	174 17.80 W			20
Amlia I./Sviech. Harbor[11]	Aleutian I.	52 01.80 N	173 23.90 W			20
Sagigik I.[11]	Aleutian I.	52 00.50 N	173 09.30 W			20
Amlia I./East[11]	Aleutian I.	52 05.70 N	172 59.00 W	52 05.75 N	172 57.50 W	20
Tanadak I. (Amlia[11])	Aleutian I.	52 04.20 N	172 57.60 W			20
Agligadak I.[11]	Aleutian I.	52 06.09 N	172 54.23 W			20

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pollock No-fishing Zones for Trawl Gear [2,8](nm)
		Latitude	Longitude	Latitude	Longitude	
Seguam I./Saddleridge Pt.[11]	Aleutian I.	52 21.05 N	172 34.40 W	52 21.02 N	172 33.60 W	20
Seguam I./Finch Pt.	Aleutian I.	52 23.40 N	172 27.70 W	52 23.25 N	172 24.30 W	20
Seguam I./South Side	Aleutian I.	52 21.60 N	172 19.30 W	52 15.55 N	172 31.22 W	20
Amukta I. & Rocks	Aleutian I.	52 27.25 N	171 17.90 W			20
Chagulak I.	Aleutian I.	52 34.00 N	171 10.50 W			20
Yunaska I.	Aleutian I.	52 41.40 N	170 36.35 W			20
Uliaga[3]	Bering Sea	53 04.00 N	169 47.00 W	53 05.00 N	169 46.00 W	10
Chuginadak	Gulf of Alaska	52 46.70 N	169 41.90 W			20
Kagamil[3]	Bering Sea	53 02.10 N	169 41.00 W			10
Samalga	Gulf of Alaska	52 46.00 N	169 15.00 W			20
Adugak I.[3]	Bering Sea	52 54.70 N	169 10.50 W			10
Umnak I./Cape Aslik[3]	Bering Sea	53 25.00 N	168 24.50 W			BA
Ogchul I.	Gulf of Alaska	52 59.71 N	168 24.24 W			20
Bogoslof I./Fire I.[3]	Bering Sea	53 55.69 N	168 02.05 W			BA
Polivnoi Rock	Gulf of Alaska	53 15.96 N	167 57.99 W			20
Emerald I.	Gulf of Alaska	53 17.50 N	167 51.50 W			20
Unalaska/Cape Izigan	Gulf of Alaska	53 13.64 N	167 39.37 W			20
Unalaska/Bishop Pt.[9]	Bering Sea	53 58.40 N	166 57.50 W			10
Akutan I./Reef-lava[9]	Bering Sea	54 08.10 N	166 06.19 W	54 09.10 N	166 05.50 W	10
Unalaska I./Cape Sedanka[6]	Gulf of Alaska	53 50.50 N	166 05.00 W			20
Old Man Rocks[6]	Gulf of Alaska	53 52.20 N	166 04.90 W			20
Akutan I./Cape Morgan[6]	Gulf of Alaska	54 03.39 N	165 59.65 W	54 03.70 N	166 03.68 W	20
Akun I./Billings Head[9]	Bering Sea	54 17.62 N	165 32.06 W	54 17.57 N	165 31.71 W	10
Rootok[6]	Gulf of Alaska	54 03.90 N	165 31.90 W	54 02.90 N	165 29.50 W	20
Tanginak I.[6]	Gulf of Alaska	54 12.00 N	165 19.40 W			20
Tigalda/Rocks NE[6]	Gulf of Alaska	54 09.60 N	164 59.00 W	54 09.12 N	164 57.18 W	20
Unimak/Cape Sarichef[9]	Bering Sea	54 34.30 N	164 56.80 W			10

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pollock No-fishing Zones for Trawl Gear [2,8](nm)
		Latitude	Longitude	Latitude	Longitude	
Aiktak[6]	Gulf of Alaska	54 10.99 N	164 51.15 W			20
Ugamak I.[6]	Gulf of Alaska	54 13.50 N	164 47.50 W	54 12.80 N	164 47.50 W	20
Round (GOA)[6]	Gulf of Alaska	54 12.05 N	164 46.60 W			20
Sea Lion Rock (Amak)[9]	Bering Sea	55 27.82 N	163 12.10 W			10
Amak I. And rocks[9]	Bering Sea	55 24.20 N	163 09.60 W	55 26.15 N	163 08.50 W	10
Bird I.	Gulf of Alaska	54 40.00 N	163 17.2 W			10
Caton I.	Gulf of Alaska	54 22.70 N	162 21.30 W			3
South Rocks	Gulf of Alaska	54 18.14 N	162 41.3 W			10
Clubbing Rocks (S)	Gulf of Alaska	54 41.98 N	162 26.7 W			10
Clubbing Rocks (N)	Gulf of Alaska	54 42.75 N	162 26.7 W			10
Pinnacle Rock	Gulf of Alaska	54 46.06 N	161 45.85 W			3
Sushilnoi Rocks	Gulf of Alaska	54 49.30 N	161 42.73 W			10
Olga Rocks	Gulf of Alaska	55 00.45 N	161 29.81 W	54 59.09 N	161 30.89 W	10
Jude I.	Gulf of Alaska	55 15.75 N	161 06.27 W			20
Sea Lion Rocks (Shumagins)	Gulf of Alaska	55 04.70 N	160 31.04 W			3
Nagai I./Mountain Pt.	Gulf of Alaska	54 54.20 N	160 15.40 W	54 56.00 N	160 15.00 W	3
The Whaleback	Gulf of Alaska	55 16.82 N	160 05.04 W			3
Chernabura I.	Gulf of Alaska	54 45.18 N	159 32.99 W	54 45.87 N	159 35.74 W	20
Castle Rock	Gulf of Alaska	55 16.47 N	159 29.77 W			3
Atkins I.	Gulf of Alaska	55 03.20 N	159 17.40 W			20
Spitz I.	Gulf of Alaska	55 46.60 N	158 53.90 W			3
Mitrofania	Gulf of Alaska	55 50.20 N	158 41.90 W			3
Kak	Gulf of Alaska	56 17.30 N	157 50.10 W			20
Lighthouse Rocks	Gulf of Alaska	55 46.79 N	157 24.89 W			20
Sutwik I.	Gulf of Alaska	56 31.05 N	157 20.47 W	56 32.00 N	157 21.00 W	20
Chowiet I.	Gulf of Alaska	56 00.54 N	156 41.42 W	55 00.30 N	156 41.60 W	20
Nagai Rocks	Gulf of Alaska	55 49.80 N	155 47.50 W			20

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pollock No-fishing Zones for Trawl Gear [2,8](nm)
		Latitude	Longitude	Latitude	Longitude	
Chirikof I.	Gulf of Alaska	55 46.50 N	155 39.50 W	55 46.44 N	155 43.46 W	20
Puale Bay	Gulf of Alaska	57 40.60 N	155 23.10 W			10
Kodiak/Cape Ikolik	Gulf of Alaska	57 17.20 N	154 47.50 W			3
Takli I.	Gulf of Alaska	58 01.75 N	154 31.25 W			10
Cape Kuliak	Gulf of Alaska	58 08.00 N	154 12.50 W			10
Cape Gull	Gulf of Alaska	58 11.50 N	154 09.60 W	58 12.50 N	154 10.50 W	10
Kodiak/Cape Ugat	Gulf of Alaska	57 52.41 N	153 50.97 W			10
Sitkinak/Cape Sitkinak	Gulf of Alaska	56 34.30 N	153 50.96 W			10
Shakun Rock	Gulf of Alaska	58 32.80 N	153 41.50 W			10
Twoheaded I.	Gulf of Alaska	56 54.50 N	153 32.75 W	56 53.90 N	153 33.74 W	10
Cape Douglas (Shaw I.)	Gulf of Alaska	59 00.00 N	153 22.50 W			10
Kodiak/Cape Barnabas	Gulf of Alaska	57 10.20 N	152 53.05 W			3
Kodiak/Gull Point[4]	Gulf of Alaska	57 21.45 N	152 36.30 W			10, 3
Latax Rocks	Gulf of Alaska	58 40.10 N	152 31.30 W			10
Ushagat I./SW	Gulf of Alaska	58 54.75 N	152 22.20 W			10
Ugak I.[4]	Gulf of Alaska	57 23.60 N	152 17.50 W	57 21.90 N	152 17.40 W	10, 3
Sea Otter I.	Gulf of Alaska	58 31.15 N	152 13.30 W			10
Long I.	Gulf of Alaska	57 46.82 N	152 12.90 W			10
Sud I.	Gulf of Alaska	58 54.00 N	152 12.50 W			10
Kodiak/Cape Chiniak	Gulf of Alaska	57 37.90 N	152 08.25 W			10
Sugarloaf I.	Gulf of Alaska	58 53.25 N	152 02.40 W			20
Sea Lion Rocks (Marmot)	Gulf of Alaska	58 20.53 N	151 48.83 W			10
Marmot I.[5]	Gulf of Alaska	58 13.65 N	151 47.75 W	58 09.90 N	151 52.06 W	15, 20
Nagahut Rocks	Gulf of Alaska	59 06.00 N	151 46.30 W			10
Perl	Gulf of Alaska	59 05.75 N	151 39.75 W			10
Gore Point	Gulf of Alaska	59 12.00 N	150 58.00 W			10
Outer (Pye) I.	Gulf of Alaska	59 20.50 N	150 23.00 W	59 21.00 N	150 24.50 W	20

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pollock No-fishing Zones for Trawl Gear [2,8](nm)
		Latitude	Longitude	Latitude	Longitude	
Steep Point	Gulf of Alaska	59 29.05 N	150 15.40 W			10
Seal Rocks (Kenai)	Gulf of Alaska	59 31.20 N	149 37.50 W			10
Chiswell Islands	Gulf of Alaska	59 36.00 N	149 34.00 W			10
Rugged Island	Gulf of Alaska	59 50.00 N	149 23.10 W	59 51.00 N	149 24.70 W	10
Point Elrington[7, 10]	Gulf of Alaska	59 56.00 N	148 15.20 W			20
Perry I.[7]	Gulf of Alaska	60 44.00 N	147 54.60 W			
The Needle[7]	Gulf of Alaska	60 06.64 N	147 36.17 W			
Point Eleanor[7]	Gulf of Alaska	60 35.00 N	147 34.00 W			
Wooded I. (Fish I.)	Gulf of Alaska	59 52.90 N	147 20.65 W			20
Glacier Island[7]	Gulf of Alaska	60 51.30 N	147 14.50 W			
Seal Rocks (Cordova)[10]	Gulf of Alaska	60 09.78 N	146 50.30 W			20
Cape Hinchinbrook[10]	Gulf of Alaska	60 14.00 N	146 38.50 W			20
Middleton I.	Gulf of Alaska	59 28.30 N	146 18.80 W			10
Hook Point[10]	Gulf of Alaska	60 20.00 N	146 15.60 W			20
Cape St. Elias	Gulf of Alaska	59 47.50 N	144 36.20 W			20

[1] Where two sets of coordinates are given, the baseline extends in a clock-wise direction from the first set of geographic coordinates along the shoreline at mean lower-low water to the second set of coordinates. Where only one set of coordinates is listed, that location is the base point.
[2] Closures as stated in 50 CFR 679.22(a)(7)(iv), (a)(8)(ii) and (b)(2)(ii).
[3] This site lies within the Bogoslof area (BA). The BA consists of all waters of area 518 as described in Figure 1 of this part south of a straight line connecting 55°00' N/170°00' W, and 55°00' N/168°11'4.75" W.
[4] The trawl closure between 0 nm to 10 nm is effective from January 20 through May 31. Trawl closure between 0 nm to 3 nm is effective from August 25 through November 1.
[5] Trawl closure between 0 nm to 15 nm is effective from January 20 through May 31. Trawl closure between 0 nm to 20 nm is effective from August 25 to November 1.
[6] Restriction area includes only waters of the Gulf of Alaska Area.
[7] Contact the Alaska Department of Fish and Game for fishery restrictions at these sites.
[8] No-fishing zones are the waters between 0 nm and the nm specified in column 7 around each site and within the BA.
[9] This site is located in the Bering Sea Pollock Restriction Area, closed to pollock trawling during the A season. This area consists of all waters of the Bering Sea subarea south of a line connecting the points 163° 0'00" W long./55°46'30" N lat., 165°08'00" W long./54°42'9" N lat., 165°40'00" long./54°26'30" N lat., 166°12'00" W long./54°18'40" N lat., and 167°0'00" W long./54°8'50" N lat.
[10] The 20 nm closure around this site is effective in federal waters outside of State of Alaska waters of Prince William Sound.
[11] Some or all of the restricted area is located in the Seguam Foraging area (SFA) which is closed to all gears types. The SFA is established as all waters within the area between 52° N lat. and 53° N lat. and between 173°30' W long. and 172°30' W long.

Table I-6 Table 5 to 50 CFR Part 679, Steller Sea Lion Protection Areas Pacific Cod Fisheries Restrictions.

Column Number 1	2	3	4	5	6	7	8	9
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pacific Cod No-fishing Zones for Trawl Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Hook-and-Line Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Pot Gear[2,3] (nm)
		Latitude	Longitude	Latitude	Longitude			
St. Lawrence I./S Punuk I.	BS	63 04.00 N	168 51.00 W			20	20	20
St. Lawrence I./SW Cape	BS	63 18.00 N	171 26.00 W			20	20	20
Hall I.	BS	60 37.00 N	173 00.00 W			20	20	20
St. Paul I./Sea Lion Rock	BS	57 06.00 N	170 17.50 W			3	3	3
St. Paul I./NE Pt.	BS	57 15.00 N	170 06.50 W			3	3	3
Walrus I. (Pribilofs)	BS	57 11.00 N	169 56.00 W			10	3	3
St George I./Dalnoi Pt.	BS	56 36.00 N	169 46.00 W			3	3	3
St. George I./S. Rookery	BS	56 33.50 N	169 40.00 W			3	3	3
Cape Newenham	BS	58 39.00 N	162 10.50 W			20	20	20
Round (Walrus Islands)	BS	58 36.00 N	159 58.00 W			20	20	20
Attu I./Cape Wrangell[11]	AI	52 54.60 N	172 27.90 E	52 55.40 N	172 27.20 E	20, 10	3	3
Agattu I./Gillon Pt.[11]	AI	52 24.13 N	173 21.31 E			20, 10	3	3
Attu I./Chirikof Pt.[11]	AI	52 49.75 N	173 26.00 E			20, 3		
Agattu I./Cape Sabak[11]	AI	52 22.50 N	173 43.30 E	52 21.80 N	173 41.40 E	20, 10	3	3
Alaid I.[11]	AI	52 46.50 N	173 51.50 E	52 45.00 N	173 56.50 E	20, 3		
Shemya I.[11]	AI	52 44.00 N	174 08.70 E			20, 3		
Buldir I.[11]	AI	52 20.25 N	175 54.03 E	52 20.38 N	175 53.85 E	20, 10	10	10
Kiska I./Cape St. Stephen[11]	AI	51 52.50 N	177 12.70 E	51 53.50 N	177 12.00 E	20, 10	3	3
Kiska I. Sobaka & Vega[11]	AI	51 49.50 N	177 19.00 E	51 48.50 N	177 20.50 E	20, 3		
Kiska I./Lief Cove[11]	AI	51 57.16 N	177 20.41 E	51 57.24 N	177 20.53 E	20, 10	3	3
Kiska I./Sirius Pt.[11]	AI	52 08.50 N	177 36.50 E			20, 3		
Tanadak I. (Kiska)[11]	AI	51 56.80 N	177 46.80 E			20, 3		
Segula I.[11]	AI	51 59.90 N	178 05.80 E	52 03.06 N	178 08.80 E	20, 3		

Column Number 1	2	3	4	5	6	7	8	9
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pacific Cod No-fishing Zones for Trawl Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Hook-and-Line Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Pot Gear[2,3] (nm)
		Latitude	Longitude	Latitude	Longitude			
Ayugadak Point[11]	AI	51 45.36 N	178 24.30 E			20, 10	3	3
Rat I./Krysi Pt.[11]	AI	51 49.98 N	178 12.35 E			20, 3		
Little Sitkin I.[11]	AI	51 59.30 N	178 29.80 E			20, 3		
Amchitka I./Column[11]	AI	51 32.32 N	178 49.28 E			20, 10	3	3
Amchitka I./East Cape[11]	AI	51 22.26 N	179 27.93 E	51 22.00 N	179 27.00 E	20,10	3	3
Amchitka I./Cape Ivakin[11]	AI	51 24.46 N	179 24.21 E			20, 3		
Semisopochnoi/Petrel Pt.[11]	AI	52 01.40 N	179 36.90 E	52 01.50 N	179 39.00 E	20, 10	3	3
Semisopochnoi I./Pochnoi Pt.[11]	AI	51 57.30 N	179 46.00 E			20, 10	3	3
Amatignak I./Nitrof Pt.[11]	AI	51 13.00 N	179 07.80 W			20, 3		
Unalga & Dinkum Rocks[11]	AI	51 33.67 N	179 04.25 W	51 35.09 N	179 03.66 W	20, 3		
Ulak I./Hasgox Pt.[11]	AI	51 18.90 N	178 58.90 W	51 18.70 N	178 59.60 W	20, 10	3	3
Kavalga I.[11]	AI	51 34.50 N	178 51.73 W	51 34.50 N	178 49.50 W	20, 3		
Tag I.[11]	AI	51 33.50 N	178 34.50 W			20, 10	3	3
Ugidak I.[11]	AI	51 34.95 N	178 30.45 W			20, 3		
Gramp Rock[11]	AI	51 28.87 N	178 20.58 W			20, 10	3	3
Tanaga I./Bumpy Pt.	AI	51 55.00 N	177 58.50 W	51 55.00 N	177 57.10 W	3		
Bobrof I.	AI	51 54.00 N	177 27.00 W			3		
Kanaga I./Ship Rock	AI	51 46.70 N	177 20.72 W			3		
Kanaga I./North Cape	AI	51 56.50 N	177 09.00 W			3		
Adak I.	AI	51 35.50 N	176 57.10 W	51 37.40 N	176 59.60 W	10	3	3
Little Tanaga Strait	AI	51 49.09 N	176 13.90 W			3		
Great Sitkin I.	AI	52 06.00 N	176 10.50 W	52 06.60 N	176 07.00 W	3		
Anagaksik I.	AI	51 50.86 N	175 53.00 W			3		
Kasatochi I.	AI	52 11.11 N	175 31.00 W			10	3	3
Atka I./N. Cape	AI	52 24.20 N	174 17.80 W			3		
Amlia I./Sviech. Harbor[4]	AI	52 01.80 N	173 23.90 W			3		

Column Number 1	2	3	4	5	6	7	8	9
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pacific Cod No-fishing Zones for Trawl Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Hook-and-Line Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Pot Gear[2,3] (nm)
		Latitude	Longitude	Latitude	Longitude			
Sagigik I.[4]	AI	52 00.50 N	173 09.30 W			3		
Amlia I./East[4]	AI	52 05.70 N	172 59.00 W	52 05.75 N	172 57.50 W	3	20	20
Tanadak I. (Amlia)[4]	AI	52 04.20 N	172 57.60 W			3	20	20
Agligadak I.[4]	AI	52 06.09 N	172 54.23 W			20	20	20
Seguam I./Saddleridge Pt.[4]	AI	52 21.05 N	172 34.40 W	52 21.02 N	172 33.60 W	10	20	20
Seguam I./Finch Pt.	AI	52 23.40 N	172 27.70 W	52 23.25 N	172 24.30 W	3	20	20
Seguam I./South Side	AI	52 21.60 N	172 19.30 W	52 15.55 N	172 31.22 W	3	20	20
Amukta I. & Rocks	AI	52 27.25 N	171 17.90 W			3	20	20
Chagulak I.	AI	52 34.00 N	171 10.50 W			3	20	20
Yunaska I.	AI	52 41.40 N	170 36.35 W			10	20	20
Uliaga[5, 14]	BS	53 04.00 N	169 47.00 W	53 05.00 N	169 46.00 W	10	BA	BA
Chuginadak[14]	GOA	52 46.70 N	169 41.90 W			20	10	20
Kagamil[5, 14]	BS	53 02.10 N	169 41.00 W			10	BA	BA
Samalga	GOA	52 46.00 N	169 15.00 W			20	10	20
Adugak I.[5]	BS	52 54.70 N	169 10.50 W			10	BA	BA
Umnak I./Cape Aslik[5]	BS	53 25.00 N	168 24.50 W			BA	BA	BA
Ogchul I.	GOA	52 59.71 N	168 24.24 W			20	10	20
Bogoslof I./Fire I.[5]	BS	53 55.69 N	168 02.05 W			BA	BA	BA
Polivnoi Rock[9]	GOA	53 15.96 N	167 57.99 W			20	10	20
Emerald I.[13, 9]	GOA	53 17.50 N	167 51.50 W			20	10	20
Unalaska/Cape Izigan[9]	GOA	53 13.64 N	167 39.37 W			20	10	20
Unalaska/Bishop Pt.[6, 13]	BS	53 58.40 N	166 57.50 W			10	10	3
Akutan I./Reef-lava[6]	BS	54 08.10 N	166 06.19 W	54 09.10 N	166 05.50 W	10	10	3
Unalaska I./Cape Sedanka[9]	GOA	53 50.50 N	166 05.00 W			20	10	20
Old Man Rocks[9]	GOA	53 52.20 N	166 04.90 W			20	10	20
Akutan I./Cape Morgan[9]	GOA	54 03.39 N	165 59.65 W	54 03.70 N	166 03.68 W	20	10	20

Column Number 1	2	3	4	5	6	7	8	9
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pacific Cod No-fishing Zones for Trawl Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Hook-and-Line Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Pot Gear[2,3] (nm)
		Latitude	Longitude	Latitude	Longitude			
Akun I./Billings Head	BS	54 17.62 N	165 32.06 W	54 17.57 N	165 31.71 W	10	3	3
Rootok[9]	GOA	54 03.90 N	165 31.90 W	54 02.90 N	165 29.50 W	20	10	20
Tanginak I.[9]	GOA	54 12.00 N	165 19.40 W			20	10	20
Tigalda/Rocks NE[9]	GOA	54 09.60 N	164 59.00 W	54 09.12 N	164 57.18 W	20	10	20
Unimak/Cape Sarichef	BS	54 34.30 N	164 56.80 W			10	3	3
Aiktak[9]	GOA	54 10.99 N	164 51.15 W			20	10	20
Ugamak I.[9]	GOA	54 13.50 N	164 47.50 W	54 12.80 N	164 47.50 W	20	10	20
Round (GOA)[9]	GOA	54 12.05 N	164 46.60 W			20	10	20
Sea Lion Rock (Amak)	BS	55 27.82 N	163 12.10 W			10	7	7
Amak I. And rocks	BS	55 24.20 N	163 09.60 W	55 26.15 N	163 08.50 W	10	3	3
Bird I.	GOA	54 40.00 N	163 17.2 W			10		
Caton I.	GOA	54 22.70 N	162 21.30 W			3	3	3
South Rocks	GOA	54 18.14 N	162 41.3 W			10		
Clubbing Rocks (S)	GOA	54 41.98 N	162 26.7 W			10	3	3
Clubbing Rocks (N)	GOA	54 42.75 N	162 26.7 W			10	3	3
Pinnacle Rock	GOA	54 46.06 N	161 45.85 W			3	3	3
Sushilnoi Rocks	GOA	54 49.30 N	161 42.73 W			10		
Olga Rocks	GOA	55 00.45 N	161 29.81 W	54 59.09 N	161 30.89 W	10		
Jude I.	GOA	55 15.75 N	161 06.27 W			20		
Sea Lion Rocks (Shumagins)	GOA	55 04.70 N	160 31.04 W			3	3	3
Nagai I./Mountain Pt.	GOA	54 54.20 N	160 15.40 W	54.56.00 N	160.15.00 W	3	3	3
The Whaleback	GOA	55 16.82 N	160 05.04 W			3	3	3
Chernabura I.	GOA	54 45.18 N	159 32.99 W	54 45.87 N	159 35.74 W	20	3	3
Castle Rock	GOA	55 16.47 N	159 29.77 W			3	3	3
Atkins I.	GOA	55 03.20 N	159 17.40 W			20	3	3
Spitz I.	GOA	55 46.60 N	158 53.90 W			3	3	3

Column Number 1	2	3	4	5	6	7	8	9
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pacific Cod No-fishing Zones for Trawl Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Hook-and-Line Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Pot Gear[2,3] (nm)
		Latitude	Longitude	Latitude	Longitude			
Mitrofania	GOA	55 50.20 N	158 41.90 W			3	3	3
Kak	GOA	56 17.30 N	157 50.10 W			20	20	20
Lighthouse Rocks	GOA	55 46.79 N	157 24.89 W			20	20	20
Sutwik I.	GOA	56 31.05 N	157 20.47 W	56 32.00 N	157 21.00 W	20	20	20
Chowiet I.	GOA	56 00.54 N	156 41.42 W	56 00.30 N	156 41.60 W	20	20	20
Nagai Rocks	GOA	55 49.80 N	155 47.50 W			20	20	20
Chirikof I.	GOA	55 46.50 N	155 39.50 W	55 46.44 N	155 43.46 W	20	20	20
Puale Bay	GOA	57 40.60 N	155 23.10 W			10		
Kodiak/Cape Ikolik	GOA	57 17.20 N	154 47.50 W			3	3	3
Takli I.	GOA	58 01.75 N	154 31.25 W			10		
Cape Kuliak	GOA	58 08.00 N	154 12.50 W			10		
Cape Gull	GOA	58 11.50 N	154 09.60 W	58 12.50 N	154 10.50 W	10		
Kodiak/Cape Ugat	GOA	57 52.41 N	153 50.97 W			10		
Sitkinak/Cape Sitkinak	GOA	56 34.30 N	153 50.96 W			10		
Shakun Rock	GOA	58 32.80 N	153 41.50 W			10		
Twoheaded I.	GOA	56 54.50 N	153 32.75 W	56 53.90 N	153 33.74 W	10		
Cape Douglas (Shaw I.)	GOA	59 00.00 N	153 22.50 W			10		
Kodiak/Cape Barnabas	GOA	57 10.20 N	152 53.05 W			3	3	3
Kodiak/Gull Point[7]	GOA	57 21.45 N	152 36.30 W			10, 3		
Latax Rocks	GOA	58 40.10 N	152 31.30 W			10		
Ushagat I./SW	GOA	58 54.75	152 22.20 W			10		
Ugak I.[7]	GOA	57 23.60 N	152 17.50 W	57 21.90 N	152 17.40 W	10, 3		
Sea Otter I.	GOA	58 31.15 N	152 13.30 W			10		
Long I.	GOA	57 46.82 N	152 12.90 W			10		
Sud I.	GOA	58 54.00 N	152 12.50 W			10		
Kodiak/Cape Chiniak	GOA	57 37.90 N	152 08.25 W			10		
Sugarloaf I.	GOA	58 53.25 N	152 02.40 W			20	10	10

Column Number 1	2	3	4	5	6	7	8	9
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Pacific Cod No-fishing Zones for Trawl Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Hook-and-Line Gear[2,3] (nm)	Pacific Cod No-fishing Zone for Pot Gear[2,3] (nm)
		Latitude	Longitude	Latitude	Longitude			
Sea Lion Rocks (Marmot)	GOA	58 20.53 N	151 48.83 W			10		
Marmot I.[8]	GOA	58 13.65 N	151 47.75 W	58 09.90 N	151 52.06 W	15, 20		
Nagahut Rocks	GOA	59 06.00 N	151 46.30 W			10		
Perl	GOA	59 05.75 N	151 39.75 W			10		
Gore Point	GOA	59 12.00 N	150 58.00 W			10		
Outer (Pye) I.	GOA	59 20.50 N	150 23.00 W	59 21.00 N	150 24.50 W	20	10	10
Steep Point	GOA	59 29.05 N	150 15.40 W			10		
Seal Rocks (Kenai)	GOA	59 31.20 N	149 37.50 W			10		
Chiswell Islands	GOA	59 36.00 N	149 34.00 W			10		
Rugged Island	GOA	59 50.00 N	149 23.10 W			10		
Point Elrington[10, 12]	GOA	59 56.00 N	148 15.20 W			20		
Perry I.[10]	GOA	60 44.00 N	147 54.60 W					
The Needle[10]	GOA	60 06.64 N	147 36.17 W					
Point Eleanor[10]	GOA	60 35.00 N	147 34.00 W					
Wooded I. (Fish I.)	GOA	59 52.90 N	147 20.65 W			20	3	3
Glacier Island[10]	GOA	60 51.30 N	147 14.50 W					
Seal Rocks (Cordova)[12]	GOA	60 09.78 N	146 50.30 W			20	3	3
Cape Hinchinbrook[12]	GOA	60 14.00 N	146 38.50 W			20		
Middleton I.	GOA	59 28.30 N	146 18.80 W			10		
Hook Point[12]	GOA	60 20.00 N	146 15.60 W			20		
Cape St. Elias	GOA	59 47.50 N	144 36.20 W			20		

BS = Bering Sea, AI = Aleutian Islands, GOA = Gulf of Alaska

[1]Where two sets of coordinates are given, the baseline extends in a clock-wise direction from the first set of geographic coordinates along the shoreline at mean lower-low water to the second set of coordinates. Where only one set of coordinates is listed, that location is the base point.

[2] Closures as stated in 50 CFR 679.22(a)(7)(v), (a)(8)(iv) and (b)(2)(iii).

[3] No-fishing zones are the waters between 0 nm and the nm specified in columns 7, 8, and 9 around each site and within the Bogoslof area (BA) and the Seguam Foraging Area (SFA).

[4] Some or all of the restricted area is located in the SFA which is closed to all gears types. The SFA is established as all waters within the area between 52° N lat. and 53° N lat. and between 173°30' W long. and 172°30' W long. Amlia I./East, and Tanadak I. (Amlia) haulouts 20 nm hook-and-line and pot closures apply only to waters located east of 173° W

longitude.
[5]This site lies within the BA which is closed to all gear types. The BA consists of all waters of area 518 as described in Figure 1 of this part south of a straight line connecting 55°00'N/170°00'W, and 55°00' N/168°11'4.75" W.
[6]Hook-and-line no-fishing zones apply only to vessels greater than or equal to 60 feet LOA in waters east of 167° W long. For Bishop Point the 10 nm closure west of 167° W. long. applies to all hook and line and jig vessels.
[7]The trawl closure between 0 nm to 10 nm is effective from January 20 through June 10. Trawl closure between 0 nm to 3 nm is effective from September 1 through November 1.
[8]The trawl closure between 0 nm to 15 nm is effective from January 20 through June 10. Trawl closure between 0 nm to 20 nm is effective from September 1 through November 1.
[9]Restriction area includes only waters of the Gulf of Alaska Area.
[10]Contact the Alaska Department of Fish and Game for fishery restrictions at these sites.
[11]Directed fishing for Pacific cod using trawl gear is prohibited in the harvest limit area (HLA) as defined at § 679.2 until the HLA Atka mackerel directed fishery in the A or B seasons is completed. The 20 nm closure around Gramp Rock applies only to waters west of 178°W long. After closure of the Atka mackerel HLA directed fishery, directed fishing for Pacific cod using trawl gear is prohibited in the HLA between 0 nm to 10 nm of rookeries and between 0 nm to 3 nm of haulouts.
[12]The 20 nm closure around this site is effective only in waters outside of the State of Alaska waters of Prince William Sound.
[13] See 50 CFR 679.22(a)(7)(i)(C) for exemptions for catcher vessels less than 60 feet (18.3 m) LOA using jig or hook-and-line gear between Bishop Point and Emerald Island closure areas.
[14]Trawl closure around this site is limited to waters east of 170°0'00" W long.

Table I-7 Table 6 to 50 CFR Part 679, Steller Sea Lion Protection Areas Atka Mackerel Fisheries Restrictions

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Atka mackerel No-fishing Zones for Trawl Gear [2,3](nm)
		Latitude	Longitude	Latitude	Longitude	
St. Lawrence I./S Punuk I.	Bering Sea	63 04.00 N	168 51.00 W			20
St. Lawrence I./SW Cape	Bering Sea	63 18.00 N	171 26.00 W			20
Hall I.	Bering Sea	60 37.00 N	173 00.00 W			20
St. Paul I./Sea Lion Rock	Bering Sea	57 06.00 N	170 17.50 W			20
St. Paul I./NE Pt.	Bering Sea	57 15.00 N	170 06.50 W			20
Walrus I. (Pribilofs)	Bering Sea	57 11.00 N	169 56.00 W			20
St. George I./Dalnoi Pt.	Bering Sea	56 36.00 N	169 46.00 W			20
St. George I./S Rookery	Bering Sea	56 33.50 N	169 40.00 W			20
Cape Newenham	Bering Sea	58 39.00 N	162 10.50 W			20
Round (Walrus Islands)	Bering Sea	58 36.00 N	159 58.00 W			20
Attu I./Cape Wrangell	Aleutian Islands	52 54.60 N	172 27.90 E	52 55.40 N	172 27.20 E	10
Agattu I./Gillon Pt.	Aleutian Islands	52 24.13 N	173 21.31 E			10
Attu I./Chirikof Pt.	Aleutian Islands	52 49.75 N	173 26.00 E			3
Agattu I./Cape Sabak	Aleutian Islands	52 22.50 N	173 43.30 E	52 21.80 N	173 41.40 E	10
Alaid I.	Aleutian Islands	52 46.50 N	173 51.50 E	52 45.00 N	173 56.50 E	3
Shemya I.	Aleutian Islands	52 44.00 N	174 08.70 E			3
Buldir I.	Aleutian Islands	52 20.25 N	175 54.03 E	52 20.38 N	175 53.85 E	15
Kiska I./Cape St. Stephen	Aleutian Islands	51 52.50 N	177 12.70 E	51 53.50 N	177 12.00 E	10
Kiska I./Sobaka & Vega	Aleutian Islands	51 49.50 N	177 19.00 E	51 48.50 N	177 20.50 E	3
Kiska I./Lief Cove	Aleutian Islands	51 57.16 N	177 20.41 E	51 57.24 N	177 20.53 E	10
Kiska I./Sirius Pt.	Aleutian Islands	52 08.50 N	177 36.50 E			3
Tanadak I. (Kiska)	Aleutian Islands	51 56.80 N	177 46.80 E			3
Segula I.	Aleutian Islands	51 59.90 N	178 05.80 E	52 03.06 N	178 08.80 E	3
Ayugadak Point	Aleutian Islands	51 45.36 N	178 24.30 E			10
Rat I./Krysi Pt.	Aleutian Islands	51 49.98 N	178 12.35 E			3
Little Sitkin I.	Aleutian Islands	51 59.30 N	178 29.80 E			3

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Atka mackerel No-fishing Zones for Trawl Gear [2,3](nm)
		Latitude	Longitude	Latitude	Longitude	
Amchitka I./Column Rocks	Aleutian Islands	51 32.32 N	178 49.28 E			10
Amchitka I./East Cape	Aleutian Islands	51 22.26 N	179 27.93 E	51 22.00 N	179 27.00 E	10
Amchitka I./Cape Ivakin	Aleutian Islands	51 24.46 N	179 24.21 E			3
Semisopochnoi/Petrel Pt.	Aleutian Islands	52 01.40 N	179 36.90 E	52 01.50 N	179 39.00 E	10
Semisopochnoi I./Pochnoi Pt.	Aleutian Islands	51 57.30 N	179 46.00 E			10
Amatignak I. Nitrof Pt.	Aleutian Islands	51 13.00 N	179 07.80 W			3
Unalga & Dinkum Rocks	Aleutian Islands	51 33.67 N	179 04.25 W	51 35.09 N	179 03.66 W	3
Ulak I./Hasgox Pt.	Aleutian Islands	51 18.90 N	178 58.90 W	51 18.70 N	178 59.60 W	10
Kavalga I.	Aleutian Islands	51 34.50 N	178 51.73 W	51 34.50 N	178 49.50 W	3
Tag I.	Aleutian Islands	51 33.50 N	178 34.50 W			10
Ugidak I.	Aleutian Islands	51 34.95 N	178 30.45 W			3
Gramp Rock[7]	Aleutian Islands	51 28.87 N	178 20.58 W			10, 20
Tanaga I./Bumpy Pt.	Aleutian Islands	51 55.00 N	177 58.50 W	51 55.00 N	177 57.10 W	20
Bobrof I.	Aleutian Islands	51 54.00 N	177 27.00 W			20
Kanaga I./Ship Rock	Aleutian Islands	51 46.70 N	177 20.72 W			20
Kanaga I./North Cape	Aleutian Islands	51 56.50 N	177 09.00 W			20
Adak I.	Aleutian Islands	51 35.50 N	176 57.10 W	51 37.40 N	176 59.60 W	20
Little Tanaga Strait	Aleutian Islands	51 49.09 N	176 13.90 W			20
Great Sitkin I.	Aleutian Islands	52 06.00 N	176 10.50 W	52 06.60 N	176 07.00 W	20
Anagaksik I.	Aleutian Islands	51 50.86 N	175 53.00 W			20
Kasatochi I.	Aleutian Islands	52 11.11 N	175 31.00 W			20
Atka I./North Cape	Aleutian Islands	52 24.20 N	174 17.80 W			20
Amlia I./Sviech. Harbor[5]	Aleutian Islands	52 01.80 N	173 23.90 W			20
Sagigik I.[5]	Aleutian Islands	52 00.50 N	173 09.30 W			20
Amlia I./East[5]	Aleutian Islands	52 05.70 N	172 59.00 W	52 05.75 N	172 57.50 W	20
Tanadak I. (Amlia)[5]	Aleutian Islands	52 04.20 N	172 57.60 W			20
Agligadak I.[5]	Aleutian Islands	52 06.09 N	172 54.23 W			20

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		Atka mackerel No-fishing Zones for Trawl Gear [2,3](nm)
		Latitude	Longitude	Latitude	Longitude	
Seguam I./Saddleridge Pt.[5]	Aleutian Islands	52 21.05 N	172 34.40 W	52 21.02 N	172 33.60 W	20
Seguam I./Finch Pt.[5]	Aleutian Islands	52 23.40 N	172 27.70 W	52 23.25 N	172 24.30 W	20
Seguam I./South Side[5]	Aleutian Islands	52 21.60 N	172 19.30 W	52 15.55 N	172 31.22 W	20
Amukta I. & Rocks	Aleutian Islands	52 27.25 N	171 17.90 W			20
Chagulak I.	Aleutian Islands	52 34.00 N	171 10.50 W			20
Yunaska I.	Aleutian Islands	52 41.40 N	170 36.35 W			20
Uliaga[6]	Bering Sea	53 04.00 N	169 47.00 W	53 05.00 N	169 46.00 W	20
Kagamil[6]	Bering Sea	53 02.10 N	169 41.00 W			20
Adugak I.[6]	Bering Sea	52 54.70 N	169 10.50 W			20
Umnak I./Cape Aslik[6]	Bering Sea	53 25.00 N	168 24.50 W			BA
Bogoslof I./Fire I.[6]	Bering Sea	53 55.69 N	168 02.05 W			BA
Unalaska/Bishop Pt.	Bering Sea	53 58.40 N	166 57.50 W			20
Akutan I./Reef-lava	Bering Sea	54 08.10 N	166 06.19 W	54 09.10 N	166 05.50 W	20
Akun I./Billings Head	Bering Sea	54 17.62 N	165 32.06 W	54 17.57 N	165 31.71 W	20
Unimak/Cape Sarichef	Bering Sea	54 34.30 N	164 56.80 W			20
Sea Lion Rock (Amak)	Bering Sea	55 27.82 N	163 12.10 W			20
Amak I. And rocks	Bering Sea	55 24.20 N	163 09.60 W	55 26.15 N	163 08.50 W	20

[1]Where two sets of coordinates are given, the baseline extends in a clock-wise direction from the first set of geographic coordinates along the shoreline at mean lower-low water to the second set of coordinates.
[2] Closures as stated in 50 CFR 679.22 (a)(7)(vi) and (a)(8)(v).
[3] No-fishing zones are the waters between 0 nm and the nm specified in column 7 around each site and within the Bogoslof area (BA).
[4] The 20 nm Atka mackerel fishery closure around the Tanaga I./Bumpy Pt. Rookery is established only for that portion of the area east of 178° W longitude.
[5] Some or all of the restricted area is located in the Seguam Foraging Area (SFA) which is closed to all gears types. The SFA is established as all waters within the area between 52° N lat. and 53° N lat. and between 173°30' W long. and 172°30' W long.
[6] This site lies in the BA, closed to all gear types. The BA consists of all waters of Area 518 described in Figure 1 of this part south of a straight line connecting 55°00'N/170°00'W and 55°00'N/168°11'4.75" W.
[7]Directed fishing for Atka mackerel by vessels using trawl gear is prohibited in waters located 0-20 nm seaward of Gramp Rock and east of 178°W long.

Table I-8 Table 12 to 50 CFR Part 679, Steller Sea Lion Protection Areas 3nm No Groundfish Fishing Sites/No Entry.

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		No transit[2]
		Latitude	Longitude	Latitude	Longitude	3 nm
Walrus I. (Pribilofs)	Bering Sea	57 11.00 N	169 56.00 W			Y
Attu I./Cape Wrangell	Aleutian I.	52 54.60 N	172 27.90 E	52 55.40 N	172 27.20 E	Y
Agattu I./Gillon Pt.	Aleutian I.	52 24.13 N	173 21.31 E			Y
Agattu I./Cape Sabak	Aleutian I.	52 22.50 N	173 43.30 E	52 21.80 N	173 41.40 E	Y
Buldir I.	Aleutian I.	52 20.25 N	175 54.03 E	52 20.38 N	175 53.85 E	Y
Kiska I./Cape St. Stephen	Aleutian I.	51 52.50 N	177 12.70 E	51 53.50 N	177 12.00 E	Y
Kiska I./Lief Cove	Aleutian I.	51 57.16 N	177 20.41 E	51 57.24 N	177 20.53 E	Y
Ayugadak Point	Aleutian I.	51 45.36 N	178 24.30 E			Y
Amchitka I./Column Rocks	Aleutian I.	51 32.32 N	178 49.28 E			Y
Amchitka I./East Cape	Aleutian I.	51 22.26 N	179 27.93 E	51 22.00 N	179 27.00 E	Y
Semisopochnoi/Petrel Pt.	Aleutian I.	52 01.40 N	179 36.90 E	52 01.50 N	179 39.00 E	Y
Semisopochnoi I./Pochnoi Pt.	Aleutian I.	51 57.30 N	179 46.00 E			Y
Ulak I./Hasgox Pt.	Aleutian I.	51 18.90 N	178 58.90 W	51 18.70 N	178 59.60 W	Y
Tag I.	Aleutian I.	51 33.50 N	178 34.50 W			Y
Gramp Rock	Aleutian I.	51 28.87 N	178 20.58 W			Y
Adak I.	Aleutian I.	51 35.50 N	176 57.10 W	51 37.40 N	176 59.60 W	Y
Kasatochi I.	Aleutian I.	52 11.11 N	175 31.00 W			Y
Agligadak I.	Aleutian I.	52 06.09 N	172 54.23 W			Y
Seguam I./Saddleridge Pt.	Aleutian I.	52 21.05 N	172 34.40 W	52 21.02 N	172 33.60 W	Y
Yunaska I.	Aleutian I.	52 41.40 N	170 36.35 W			Y
Adugak I.	Bering Sea	52 54.70 N	169 10.50 W			Y
Ogchul I.	Gulf of Alaska	52 59.71 N	168 24.24 W			Y
Bogoslof I./Fire I.	Bering Sea	53 55.69 N	168 02.05 W			Y
Akutan I./Cape Morgan	Gulf of Alaska	54 03.39 N	165 59.65 W	54 03.70 N	166 03.68 W	Y
Akun I./Billings Head	Bering Sea	54 17.62 N	165 32.06 W	54 17.57 N	165 31.71 W	Y
Ugamak I.	Gulf of Alaska	54 13.50 N	164 47.50 W	54 12.80 N	164 47.50 W	Y
Sea Lion Rock (Amak)	Bering Sea	55 27.82 N	163 12.10 W			Y

Column Number 1	2	3	4	5	6	7
Site Name	Area or Subarea	Boundaries from		Boundaries to[1]		No transit[2]
		Latitude	Longitude	Latitude	Longitude	3 nm
Clubbing Rocks (S)	Gulf of Alaska	54 41.98 N	162 26.7 W			Y
Clubbing Rocks (N)	Gulf of Alaska	54 42.75 N	162 26.7 W			Y
Pinnacle Rock	Gulf of Alaska	54 46.06 N	161 45.85 W			Y
Chernabura I.	Gulf of Alaska	54 45.18 N	159 32.99 W	54 45.87 N	159 35.74 W	Y
Atkins I.	Gulf of Alaska	55 03.20 N	159 17.40 W			Y
Chowiet I.	Gulf of Alaska	56 00.54 N	156 41.42 W	55 00.30 N	156 41.60 W	Y
Chirikof I.	Gulf of Alaska	55 46.50 N	155 39.50 W	55 46.44 N	155 43.46 W	Y
Sugarloaf I.	Gulf of Alaska	58 53.25 N	152 02.40 W			Y
Marmot I.	Gulf of Alaska	58 13.65 N	151 47.75 W	58 09.90 N	151 52.06 W	Y
Outer (Pye) I.	Gulf of Alaska	59 20.50 N	150 23.00 W	59 21.00 N	150 24.50 W	Y
Wooded I. (Fish I.)	Gulf of Alaska	59 52.90 N	147 20.65 W			
Seal Rocks (Cordova)	Gulf of Alaska	60 09.78 N	146 50.30 W			

[1] Where two sets of coordinates are given, the baseline extends in a clock-wise direction from the first set of geographic coordinates along the shoreline at mean lower-low water to the second set of coordinates. Where only one set of coordinates is listed, that location is the base point.

[2] See 50 CFR 223.202(a)(2)(i) for regulations regarding 3 nm no transit zones.

Note: No groundfish fishing zones are the waters between 0 nm to 3 nm surrounding each site.

Table I-9 **Comparison of proposed management measures to previous management regimes.**

Management Measures	1999 Fishery	RPA from the FMP Biological Opinion	Proposed Action
Control Rule	Amendment 56 Tiers	NMFS 2000 Biological Opinion Global Control Rule	Modified Global Control Rule - no directed fishing if biomass < B20%.
No Transit Zones	3 nm no-transit zones around principal rookeries	3 nm no-transit zones around principal rookeries	3 nm no-transit zones around principal rookeries
Area Closures	No trawling 10/20 nm from 37 rookeries	All CH/RFRPA sites designated as restricted or closed to fishing for pollock, cod, and mackerel	Specified closures around around rookeries & haulouts by fishery, area, and gear type; SBSRA closed to pollock fishing; area 4, area 9, and Seguam closed to directed fishing for pollock, cod, and mackerel. AI closed to pollock fishing in 2002.
Season Closures	No trawling 1/1 to 1/20	No trawling 1/1 to 1/20; no trawling for pollock, cod, or mackerel 11/1 to 1/20; no fishing for pollock, cod, or mackerel inside CH 11/1 to 1/20	No trawling 1/1to 1/20; closure period between GOA pollock seasons; no trawling for pollock or cod 11/1 to 12/31
Seasons and Apportionments pollock	BSAI - 1/20 (45%), 9/1 (55%); GOA - 1/20 to 4/1 (25%), 6/1 to 7/1 (35%), 9/1 to 12/31 (40%)	BSAI - 1/20 (40%), 6/11 (60%); GOA - 1/20 (40%), 6/11 (60%)	AI - 1/20 (100%); BS 1/20 (40%), 6/11 (60%); GOA - 1/20 to 2/25 (25%); 3/10 to 5/31 (25%), 9/25 to 9/15 (25%), 10/1 to 11/1 (25%)
Seasons and Apportionments cod	BSAI trawl - 1/20 BSAI fixed -1/1, 5/1, 9/1 GOA trawl -1/20 GOA fixed - 1/1	BSAI - 1/20 (40%), 6/11 (60%); GOA - 1/20 (40%), 6/11 (60%)	BSAI trawl - 1/20-3/31 (60%), 4/1-6/10 (20%), 6/10-10/31 (20%) BSAI longline- 1/1 (60%), 6/11 (40%) BSAI pot - 1/1 (60%), 9/1 (40%) GOA trawl - 1/20 (60%), 9/1 (40%) GOA fixed - 1/1 (60%), 9/1 (40%)
Seasons and Apportionments mackerel	AI - 1/20 to 4/15 (50%), 9/1 to 10/31 (50%)	BSAI - 1/20 (40%), 6/11 (60%); GOA - 1/20 (40%), 6/11 (60%)	AI - 1/20 to 4/15 (50%), 9/1to 10/31 (50%)

Management Measures	1999 Fishery	RPA from the FMP Biological Opinion	Proposed Action
Catch Limits Inside CH	Akta mackerel: incremental change to limit of 40% inside CH in 2002	Pollock, cod, and mackerel: 4 seasons (1/20, 4/1, 5/11 8/22) inside CH/RFRPA with catch limits based on season and area specific biomass estimates	A season pollock harvest in SCA limited to 28% of annual TAC prior to April 1 Mackerel 60% inside 40% outside of each season apportionment GOA cod: option for AMCC zonal approach for GOA Pacific cod.
Other Catch Limits			Platoon management of the Atka mackerel fishery
Experimental Design	Small scale: Kodiak and Seguam localized depletion testing	Large scale: 4 sets of restricted/closed areas for comparison	Small scale experiments for Pacific cod, Atka mackerel, and pollock testing local depletion hypothesis
Observer Coverage	No change to current observer coverage requirements	No change to current observer coverage requirements	No change to current observer coverage requirements
VMS	Required in BSAI Atka mackerel fishery		VMS required on all vessels (except those using jig gear) when fishing for pollock, cod, or mackerel.
Registration Requirements	None	None	Preregistration required for Atka mackerel fishery

Table I-10 The amount of area closed in the BSAI and GOA under the Steller sea lion conservation measures. Given the complexity of the conservation measures, closure areas are described for each fishery and area.

			Area Closed Km^2				Critical Habitat Km^2						0-20 nm Area of Critical Habitat		
Region	Fishery	Gear	0-3	3-10	10-20	Foraging Area	0-3	3-10	10-20	Foraging Area	(Area)	Total CH	Total Closed 0-20	Total 0-20 CH	% 0-20 Closed
AI	Pollock	Trawl	4,294	31,182	61,364	2,631	4,294	31,182	61,364	2,631	Seguam	99,472	96,841	96,841	100
	Pacific Cod	Trawl	4,294	15,775	2,611	2,631	4,294	31,182	61,364	2,631	Seguam	99,472	22,681	96,841	23
		Pot	4,294	18,092	11,080	2,631	4,294	31,182	61,364	2,631	Seguam	99,472	33,466	96,841	35
		Longline	4,294	18,092	11,080	2,631	4,294	31,182	61,364	2,631	Seguam	99,472	33,466	96,841	35
	Atka Mackerel	Trawl	4,294	23,526	27,640	2,631	4,294	31,182	61,364	2,631	Seguam	99,472	55,460	96,841	57
EBS	Pollock	Trawl	1,661	12,759	22,497	24,098	1,661	13,849	37,419	53,020	SCA	105,948	36,916	52,928	70
	Pacific Cod	Trawl	1,661	12,759	22,497	24,098	1,661	13,849	37,419	53,020	SCA	105,948	36,916	52,928	70
		Pot	1,661	8,689	22,496	24,098	1,661	13,849	37,419	53,020	SCA	105,948	32,845	52,928	62
		Longline	1,661	8,472	21,446	23,252	1,661	13,849	37,419	53,020	SCA	105,948	31,578	52,928	60
	Atka Mackerel	Trawl	1,661	13,849	37,426	24,098	1,661	13,849	37,419	53,020	SCA	105,948	52,935	52,928	100
GOA	Pollock	Trawl	6,128	38,165	38,243	0	6,128	46,109	78,997	12,875	Shelikof	144,109	82,536	131,234	63
	Pacific Cod	Trawl	6,128	38,165	38,243	0	6,128	46,109	78,997	12,875	Shelikof	144,109	82,536	131,234	63
		Pot	3,530	13,325	21,385	0	6,128	46,109	78,997	12,875	Shelikof	144,109	38,241	131,234	29
		Longline	3,530	13,325	12,574	0	6,128	46,109	78,997	12,875	Shelikof	144,109	29,430	131,234	22

Sum 0-3, 3-10, 10-20 for total 0-20

Includes year round closures only; areas open seasonally are not included in "closure areas"

Forgaing Area values in this table do not include the area inside 0-20 nm critical habitat. This allows all the data to be additive to get total

	Total Area	0-20 CH Area	(Foraging Area) - (0-20 Area)
Segaum	7318	4,687	2,631
SCA	75100	22,080	53,020
Shelikof	27948	15,073	12,875

Table I-11 The amount of area closed in the BSAI and GOA under the Steller sea lion conservation measures as a percentage of each zone. Given the complexity of the conservation measures, closure areas are described for each fishery and area.

			% Area Closed					
Region	Fishery	Gear	0-3	3-10	*[0-10]*	10-20	Foraging Area	Total CH
AI	Pollock	Trawl	100%	100%	*100%*	100%	100%	100%
	Pacific Cod	Trawl	100%	51%	*57%*	4%	100%	25%
		Pot	100%	58%	*63%*	18%	100%	36%
		Longline	100%	58%	*63%*	18%	100%	36%
	Atka Mackerel	Trawl	100%	75%	*78%*	45%	100%	58%
EBS	Pollock	Trawl	100%	92%	*93%*	60%	45%	58%
	Pacific Cod	Trawl	100%	92%	*93%*	60%	45%	58%
		Pot	100%	63%	*67%*	60%	45%	54%
		Longline	100%	61%	*65%*	57%	44%	52%
	Atka Mackerel	Trawl	100%	100%	*100%*	100%	45%	73%
GOA	Pollock	Trawl	100%	83%	*85%*	48%	0%	57%
	Pacific Cod	Trawl	100%	83%	*85%*	48%	0%	57%
		Pot	58%	29%	*32%*	27%	0%	27%
		Longline	58%	29%	*32%*	16%	0%	20%

Table II-1 Locations of instrumented Steller sea lions inside and outside of critical habitat based on satellite data (source: FMP BiOp Table 4.3).

Breeding	Number of Locations Within Critical Habitat	Number of Locations Outside Critical Habitat	Percentage	Number of Locations Total	# of Animals (n)	Locations Per animal
Jan-Mar	260.00	5.00	1.89	265.00	5.00	53.00
Apr-June	101.00	22.00	17.89	123.00	4.00	30.75
July-Sept	401.00	0.00	0.00	401.00	13.00	30.85
Oct-Dec	4.00	5.00	55.56	9.00	2.00	4.50
Non-Breeding						
Jan-Mar	1210.00	10.00	0.82	1220.00	20.00	61.00
Apr-June	1110.00	66.00	5.61	1176.00	13.00	90.46
July-Sept	71.00	0.00	0.00	71.00	2.00	35.50
Oct-Dec	264.00	24.00	8.33	288.00	9.00	32.00

Table II-2 Locations at-sea for Steller sea lions in summer and winter from the 2001 BiOp. The table was modified to reflect just one zone from 0-10 nm (i.e., the 0-3 and 3-10 nm zones were combined). Percentages reflect the proportion of locations obtained within distances from the nearest point of shore. Sample sizes (n) refer to the total number of locations received for young-of-the-year (YOY), juveniles, and adults (not the total number of animals tracked). The database used was observations for sea lions instrumented between 1990-2000 (from the NMML database [i.e., does not include animals instrumented in Southeast Alaska in the eastern population] ADF&G and NMFS 2001, their Table 1).

"Table 5.1a" from 2001 BiOp unfiltered adults	Summer (Apr–Sept)	Winter (Oct–Mar)
Zone	**Adults (*n=201*)**	**Adults (*n*=96)**
0-10 nm	95.6 %	79.2 %
10-20 nm	0 %	4.2 %
beyond 20 nm	4.5 %	16.7 %

"Table 5.1a" from 2001 BiOp unfiltered pups and juveniles	Summer (Apr–Sept)	Winter (Oct–Mar)
Zone	**YOY/Juveniles (*n=274*)**	**YOY/Juveniles (*n=1062*)**
0-10 nm	74.4 %	99.1 %
10-20 nm	5.1 %	0.6 %
beyond 20 nm	20.4 %	0.4 %

Table II-3 Percentages of locations assigned to distance bins measuring the maximum straight-line trip distances from departure site for adult females in the Gulf of Alaska and Aleutian Islands during summer (30 trips among 5 animals) and winter (39 trips among 6 animals). Analysis originally prepared for buffer zone size determination in 1999, using data from Merrick (1995), and Merrick and Loughlin (1997).

Distance bin (nm)	Summer (%)	Winter (%)
0-10	80.0	25.6
10-20	16.7	7.7
>20	3.3	66.7

Table II-4 Trip types and distances (n=564 individual trips) measured from 25 SDR-equipped juvenile (6-22 month olds) Steller sea lions, as reported in Loughlin et al. (2003). Trip distances based on maximum straight-line distance from departure site.

	Distance (nm)			Proportion	
Trip type	Mean	sd	Range	of all trips	Comments
Transit	36.0	45.2	3.5-185	6%	
Long-range	26.3	30.1	≤130	6%	Start at 9 mos of age
Short-range	1.9	0.2	≤11	88%	Frequency of ~ 1 day

Table II-5 Individual trip distances of SDR-equipped Steller sea lions by age group. Trip distances based on maximum straight-line distance from departure (tagging) site.

	Distance					
Age group	Mean	sd	Median	Range	Trips (n)	Animals (n)
Juveniles						
≤10 mo[1]	3.8	10.3	1.5	0.05-141	257	13
≥10 mo[1]	13.3	30.9	13.3	≤0.5-242	307	15
Adult female[2]						
summer	9.2	5.5		2-26	30	5
winter	71.8	72.4		3-293	30	5
winter, with pups	29					2

[1] Loughlin et al. (2003)
[2] Merrick and Loughlin (1997) and Merrick (1995)
[3] Subset of 5 animals with winter attachments

Table II-6 Number of locations associated with diving and percent of those locations found in various zones from a listed rookery or haulout site or from any point of land, based on juvenile Steller sea lions instrumented from 2000-2002 (NMML data based on analyses prepared January 14 and February 14, 2003).

	Distance from listed rookery or haulout site		Distance from any point of land	
Zone	**Summer (Apr–Sept) (n[1] =6,470)**	**Winter (Oct–Mar) (n=3,536)**	**Summer (Apr–Sept) (n=6,470)**	**Winter (Oct–Mar) (n=3,536)**
0-10 nm	88.9%	90.3%	96.6%	98.4%
10-20 nm	5.8%	7.0%	1.4%	1.5%
>20 nm in CH	2.4%	1.7%	2.0% [2]	0.2% [2]
Outside CH	2.9%	1.0%		

[1] n=the number of telemetry locations received from all the animals.
[2] Indicates area beyond 20 nm, including areas beyond critical habitat

Table II-7 Number of locations associated with diving and percent of those locations found in various zones from a listed rookery or haulout site, based on juvenile Steller sea lions instrumented from 2000-2002 (NMML data based on analyses prepared January 14 and February 14, 2003). The data was then split into age classes, 0-10 months and greater than 10 months (10,006 total locations).

	Summer (Apr–Sept)		Winter (Oct–Mar)	
Zone	**0-10 Months (n[1] =41,n[2] =2920)**	**>10 Months (n=46, n=3550)**	**0-10 Months (n=45, n=2950)**	**>10 Months (n=8, n=586)**
0-10 nm	91.0 %	87.1 %	94.7 %	67.9 %
10-20 nm	4.7 %	6.8 %	3.9 %	22.4 %
>20 nm in CH	1.6 %	3.0 %	0.5 %	7.7 %
Outside CH	2.8 %	3.1 %	0.8 %	2.0 %

[1] n=the number of animals instrumented.
[2] n=the number of telemetry locations received from all the animals.

Table II-8 A qualitative summary of the information available to date on the types of trips made by various age classes of sea lions during summer and winter (information combined from data presented in this section).

Class of Sea Lion	Age	Summer (Apr-Sept)	Winter (Oct-Mar)
YOY	0- ~11 months	Close to rookeries	Close to shore
Juvenile	~11 months-24 months	Close to shore, and then farther offshore into the fall	Nearshore or offshore depending upon proximity to prey resources
Juvenile	2 years-4 years	unknown	unknown
Adult Female	>4 years	Close to a rookery in order to nurse a pup	Much farther ranging in search of prey
Adult Male	>4 years	Bulls on rookeries, others far ranging	Far ranging

Table II-9 Revised level of concern table depicting NMFS's rating in the 2001 BiOp and the revised rating in this document. Also included is telemetry data during the winter from Table II-7 above.

	Level of Concern	Summer (Apr-Sept)	Winter (Oct–Mar)
Zone	**2001 BiOp**	**>10 Months (n=46, h=3,550)**	**>10 Months (n=8, h=586)**
0-10 nm	High	87.1 %	67.9 %
10-20 nm	Low to moderate	6.8 %	22.4 %
>20 nm in CH	Low	3.0 %	7.7 %
Outside CH	Low	3.1 %	2.0 %

Table III-1 Scores to the "seven questions" based on answers about competitive interactions between target fisheries and the western population of Steller sea lions in the Bering Sea/Aleutian Islands and Gulf of Alaska areas (Table 6-6 from the FMP BiOp).

Fished Species or Target Fishery	Bering Sea/ Aleutian Islands	Gulf of Alaska
Pollock	**8**	**8**
Pacific cod	**8**	**8**
Atka mackerel	**8**	0
Sablefish	0	0
Yellowfin sole	0	1
Rock sole	1	1
Greenland turbot	1	1
Arrowtooth flounder	2	2
Flathead sole	0	1
Other flatfish	1	1
Pacific ocean perch	1	1
Other red rockfish	1	n/a
Sharpchin/northern rockfish	1	1
Shortraker/rougheye rockfish	1	0
Squid	2	n/a
Other species	1	1
Flatfish, Deep	n/a	0
Flatfish, Shallow	n/a	1
Rex sole	n/a	0
Rockfish, other slope	n/a	0
Rockfish, pelagic shelf	n/a	1
Rockfish, demersal shelf	n/a	1
Thornyhead	n/a	0
Forage fish	2	2

n/a = not applicable; this target fishery definition is not applicable in this fishery management area.

Table III-2 Summary of catch in critical habitat by zones from 1991-2002 in the BSAI.

BSAI Pollock Catch by Zones 1991-2002

Year	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	CH %
1991	454	51,238	341,897	393,589	664,927	204,208	260,711	719,941	1,328,838	54%
1992	161	80	257	498	553,516	80	308	638,383	1,442,923	44%
1993	394	25,566	155,421	181,381	635,052	63,240	91,205	722,049	1,384,512	52%
1994	1,647	36,092	196,630	234,369	789,537	105,436	84,998	842,196	1,388,502	61%
1995	5,205	80,394	219,437	305,036	825,260	166,940	109,632	889,107	1,316,353	68%
1996	2,276	37,090	176,845	216,210	552,615	98,951	65,743	584,054	1,101,738	53%
1997	2,430	36,561	133,241	172,232	545,000	63,574	58,378	571,850	1,038,254	55%
1998	3,416	49,787	162,323	215,526	625,472	75,944	88,127	644,940	1,125,098	57%
1999	24	1,125	41,566	42,715	323,619	2,339	5,418	329,095	980,124	34%
2000	147	2,849	29,188	32,184	162,156	2,164	29,082	192,350	1,133,713	17%
2001	204	8,835	228,852	237,892	495,018	146,400	119,735	556,365	1,386,179	40%
2002	106	11,141	222,584	233,831	230,079	125,619	104,349	738,383	1,482,297	50%

BSAI Pacific Cod Catch by Zones 1991-2002

Year	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	CH %
1991	276	11,295	25,702	37,273	54,803	13,684	18,140	61,922	172,293	36%
1992	622	12,364	27,361	40,347	41,151	9,698	24,052	59,249	207,372	29%
1993	225	9,457	28,990	38,672	53,204	9,708	22,720	71,173	167,325	43%
1994	362	16,020	30,941	47,323	65,433	21,088	27,652	86,957	178,481	49%
1995	1,679	21,459	51,728	74,867	105,230	26,545	32,515	125,631	243,534	52%
1996	698	25,955	41,669	68,322	81,097	33,080	40,206	111,281	221,926	50%
1997	467	21,702	40,130	62,298	80,288	26,115	36,827	107,688	234,888	46%
1998	1,141	21,745	41,539	64,425	72,999	27,513	40,038	86,212	183,327	47%
1999	690	18,540	37,528	56,758	47,375	23,429	35,626	80,630	173,708	46%
2000	775	19,748	44,573	65,096	55,843	27,266	40,100	94,408	190,851	49%
2001	287	10,705	39,837	50,829	34,583	26,205	36,023	70,708	171,992	41%
2002	35	11,161	41,180	52,375	48,589	18,046	33,033	78,167	195,710	40%

BSAI Atka Mackerel Catch by Zones 1991-2002

Year	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	CH %
1991	265	19,865	2,157	22,286	15,533	21,959	22,081	22,313	24,175	92%
1992	378	4,768	8,566	13,712	2,413	7,182	12,460	13,845	48,523	29%
1993	192	835	27,164	28,191	418	2,949	25,403	28,242	65,121	43%
1994	549	3,959	39,628	44,136	76	36,630	37,812	44,186	64,527	68%
1995	197	6,193	61,525	67,915	234	62,359	41,411	67,958	80,672	84%
1996	150	9,445	60,161	69,756	758	54,457	39,846	69,845	93,919	74%
1997	1,525	4,087	41,926	47,538	161	37,734	29,765	47,553	58,785	81%
1998	68	2,987	42,627	45,682	1,094	39,703	24,261	45,719	56,387	81%
1999	285	7,568	22,563	30,416	2,316	25,342	19,067	30,427	56,236	54%
2000	373	2,727	16,668	19,768	130	17,178	6,788	19,465	47,226	41%
2001	286	4,268	22,385	26,939	351	23,658	14,854	26,581	61,477	43%
2002	0	1,424	20,101	21,567	777	18,375	6,321	21,591	45,257	48%

Table III-3 Summary of catch in critical habitat by zones from 1991-2002 in the GOA.

GOA Pollock Catch by Zones 1991-2002										
Year	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	CH %
1991	2,065	13,537	26,192	41,794	4,533	6,825	34,528	43,328	79,875	54%
1992	2,037	12,149	42,574	56,761	19,625	6,880	52,664	62,405	90,853	69%
1993	6,820	28,217	46,838	81,875	32,114	19,141	76,362	89,409	108,922	82%
1994	1,794	22,939	53,024	77,757	20,692	18,795	73,323	86,300	107,333	80%
1995	331	7,232	40,864	48,427	9,694	13,566	38,407	53,350	72,616	73%
1996	898	10,210	23,008	34,117	9,823	6,124	31,836	38,751	51,263	76%
1997	2,511	24,448	34,161	61,121	20,057	5,520	55,354	68,702	90,127	76%
1998	13,521	39,572	40,099	93,193	23,626	3,524	85,507	104,729	125,098	84%
1999	1,781	14,451	45,413	61,646	35,319	3,837	60,904	79,165	95,590	83%
2000	207	10,537	24,195	34,939	22,186	9,327	34,109	39,225	65,950	59%
2001	725	8,902	45,460	55,088	26,954	11,217	53,299	57,092	72,006	79%
2002	0	5,955	19,668	25,624	9,276	3,125	24,866	28,479	51,873	55%

GOA Pacific Cod Catch by Zones 1991-2002										
Year	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	CH %
1991	2,745	17,506	37,171	57,422	5,291	34,152	39,932	58,503	76,213	77%
1992	741	13,378	44,582	58,701	2,108	31,606	37,823	59,228	80,422	74%
1993	289	10,534	19,020	29,842	3,767	5,372	26,103	32,238	56,476	57%
1994	1,042	8,383	21,779	31,205	3,826	13,018	24,159	32,155	48,112	67%
1995	922	13,145	29,324	43,391	6,532	19,035	29,589	45,526	68,907	66%
1996	665	11,459	30,031	42,155	6,579	24,102	25,104	46,218	68,227	68%
1997	3,046	17,700	25,614	46,360	2,870	18,911	38,407	47,340	68,448	69%
1998	311	8,880	21,012	30,204	3,384	7,797	26,790	32,388	62,105	52%
1999	340	9,403	16,977	26,720	3,544	8,720	23,670	29,383	68,555	43%
2000	120	17,867	11,305	29,292	2,848	5,960	16,654	29,936	48,091	62%
2001	57	4,000	14,492	18,550	544	2,981	17,011	18,790	41,441	45%
2002	16	4,625	11,860	16,501	1,960	4,009	13,700	18,082	42,306	43%

Table III-4 Comparison of the change from 1999 - 2002 as a percent of the portion of catch in critical habitat by zones. A negative indicates a reduction, positive numbers indicate an increase in catch. The column marked "Total CH" refers to the total catch in critical habitat areas including the foraging areas.

GOA		GOA % of Total Catch in CH Areas				Change from 1999 to 2002 as %		
Gear	Year	0-3	3-10	10-20	Total CH	3-10	10-20	Total CH
Pollock Trawl	1999	1.9	15.1	47.5	82.8	-24%	-20%	-34%
	2002	0.0	11.5	37.9	54.9			
Cod Trawl	1999	0.6	11.6	21.4	34.9	-7%	12%	3%
	2002	0.0	10.8	24.0	36.1			
Cod Pot	1999	0.5	18.0	18.3	48.1	-18%	127%	31%
	2002	0.1	14.8	41.5	63.2			
Cod H&L	1999	0.1	13.4	44.8	58.8	-32%	-41%	-30%
	2002	0.0	9.1	26.5	41.1			

BSAI		BSAI % of Total Catch in CH Areas				Change from 1999 to 2002 as %		
Gear	Year	0-3	3-10	10-20	Total CH	3-10	10-20	Total CH
Pollock Trawl	1999	0.0	0.1	4.2	33.6	560%	255%	49%
	2002	0.0	0.8	15.1	50.0			
Cod Trawl	1999	0.3	9.1	30.4	64.4	-46%	25%	0%
	2002	0.0	4.9	37.9	64.4			
Mackerel Trawl	1999	0.5	13.4	40.1	54.0	-77%	11%	-12%
	2002	0.0	3.0	44.4	47.6			
Cod Pot	1999	2.0	39.1	35.0	81.9	-4%	-25%	-18%
	2002	0.0	37.8	26.2	67.5			
Cod H&L	1999	0.2	6.7	12.5	26.2	-75%	-41%	-34%
	2002	0.0	1.7	7.4	17.3			

BSAI and GOA		% of Total Catch in CH Areas				Change from 1999 to 2002 as %		
ALL GEAR	1999	0.2	3.7	11.9	39.8	-49.1	45.8	22.2
	2002	0.0	1.9	17.4	48.7			

Table III-5 Atka mackerel catch inside critical habitat in the Aleutian Islands from 2001 and 2002. This table presents the average catch rate per day by areas 542 and 543 (central and western Aleutian Islands) and the maximum daily catch rate. Platoons are described in 2002 and the relative changes to the catch rates due to the platoon management of the fishery.

		2001		2002			Compare 02 to 01	
		CH542	CH543	"Platoon"	CH542	CH543	CH542	CH543
A season	Average catch/day	631,242	479,546	1st fishery	448,210	310,033	68%	67%
				2nd fishery	480,560	383,834		
				Combined	428,663	320,246		
	Max daily rate	978,622	829,617	Combined	600,111	642,347	61%	77%
B season	Average catch/day	951,654	461,993	1st fishery	444,763	500,292	49%	88%
				2nd fishery	670,900	381,641		
				Combined	464,860	405,231		
	Max daily rate	1,253,502	973,985	Combined	820,892	662,069	65%	68%

Table III-6 This is a comparison of "traditional" fishing areas in 1991, 1998, and 1999 compared to the closure zones implemented in 2002 to determine the amount of traditional catch that would be forgone under the Steller sea lion conservation measures. Amounts described are catch in 1991,1998, or 1999 that would now be forgone because of a closure area under the 2002 Steller sea lion conservation measures.

P.Cod		Percent CH displaced		
Area	Gear	1991	1998	1999
GOA	Longline	2	13	4
GOA	Pot	39	31	20
GOA	Trawl	52	22	19
EBS	Longline	2	2	2
EBS	Pot	7	3	5
EBS	Trawl	11	0	4
AI	Longline	23	45	4
AI	Pot	51	79	29
AI	Trawl	36	8	32
TOTAL		19	10	8

Pollock		Percent CH displaced		
Area	Gear	1991	1998	1999
GOA	Trawl	38	52	10
EBS	Trawl	28	1	1
AI	Trawl	74	0	100
TOTAL		32	6	2

Atka Mackerel		Percent CH displaced		
Area	Gear	1991	1998	1999
EBS	Trawl	100	100	100
AI	Trawl	89	1	18
TOTAL		90	2	21

Table III-7 Estimates of Steller sea lion prey biomass by region and the corresponding fishery harvest rate for 1999 and 2002. This reflects the change in harvest rates as created by implementing the Steller sea lion conservation measures. The line marked "biomass proportions" reflects the amount of total biomass inside or outside critical habitat zones. Catch is in thousands of mt.

Table III-7a

	Gulf of Alaska -- Pollock											
January-June	**0-10 nm**		**10-20 nm**		**Foraging Area**		**CH Total**		**Outside CH**		**Total**	
Biomass proportions	30%		44%		7%		82%		18%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	9.8	0.9	35.9	6.4	7.3	1.7	53.0	9.0	6.0	13.2	59.0	22.2
Biomass mt (age 2+)	205.9	200.1	299.2	290.7	47.7	46.4	552.9	537.3	123.1	119.7	676.0	657.0
Catch/Biomass	4.8%	0.4%	12.0%	2.2%	15.3%	3.7%	9.6%	1.7%	4.9%	11.0%	8.7%	3.4%
July-December												
Biomass proportions	30%		43%		7%		80%		20%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	6.4	5.1	9.4	13.3	10.2	1.1	26.0	19.5	10.4	10.1	36.4	29.6
Biomass mt (age 2+)	191.4	194.6	256.3	277.6	39.3	43.6	487.0	515.8	130.0	119.0	617.0	634.8
Catch/Biomass	3.3%	2.6%	3.7%	4.8%	25.9%	2.5%	5.3%	3.8%	8.0%	8.5%	5.9%	4.7%
Annual												
Biomass proportions	30%		44%		7%		81%		19%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	16.2	6.0	45.3	19.7	17.5	2.8	79.0	28.5	16.4	23.3	95.4	51.8
Biomass mt (age 2+)	205.9	200.1	299.2	290.7	47.7	46.4	552.9	537.3	123.1	119.7	676.0	657.0
Catch/Biomass	7.9%	3.0%	15.1%	6.8%	36.7%	6.0%	14.3%	5.3%	13.3%	19.5%	14.1%	7.9%

Table III-7b

	Gulf of Alaska – Pacific Cod											
January-June Biomass proportions	**0-10 nm** 23%		**10-20 nm** 34%		**Foraging Area** 5%		**CH Total** 62%		**Outside CH** 38%		**Total** 100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	8.3	2.8	15.9	7.8	2.4	1.4	26.6	12.0	27.0	17.7	53.6	29.7
Biomass mt (age 3+)	144.5	105.7	210.0	153.5	33.5	24.5	388.0	283.7	233.0	170.3	621.0	454.0
Catch/Biomass	5.7%	2.6%	7.6%	5.1%	7.2%	5.7%	6.9%	4.2%	11.6%	10.4%	8.6%	6.5%
July-December Biomass proportions	19%		28%		5%		52%		48%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	1.4	1.9	1.0	4.1	0.5	0.1	2.9	6.1	12.1	6.5	15.0	12.6
Biomass mt (age 3+)	112.3	85.3	159.2	120.2	25.6	19.0	297.1	224.6	270.3	199.7	567.4	424.3
Catch/Biomass	1.2%	2.2%	0.6%	3.4%	2.0%	0.5%	1.0%	2.7%	4.5%	3.3%	2.6%	3.0%
Annual Biomass proportions	21%		31%		5%		57%		43%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	9.7	4.7	16.9	11.9	2.9	1.5	29.5	18.1	39.1	24.2	68.6	42.3
Biomass mt (age 3+)	144.5	105.7	210.0	153.5	33.5	24.5	388.0	283.7	233.0	170.3	621.0	454.0
Catch/Biomass	6.7%	4.4%	8.0%	7.8%	8.7%	6.1%	7.6%	6.4%	16.8%	14.2%	11.0%	9.3%

Table III-7c

	Eastern Bering Sea – Pollock											
January-June Biomass proportions	**0-10 nm** 8%		**10-20 nm** 16%		**Foraging Area** 19%		**CH Total** 44%		**Outside CH** 56%		**Total** 100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	0.5	2.8	16.1	84.3	178.3	235.2	194.9	322.3	215.7	343.8	410.6	666.1
Biomass mt (age 3+)	870.8	898.8	1,754.8	1,811.1	2,070.4	2,136.9	4,696.0	4,846.8	6,076.0	6,271.2	10,772	11,118
Catch/Biomass	0.1%	0.3%	0.9%	4.7%	8.6%	11.0%	4.2%	6.6%	3.6%	5.5%	3.8%	6.0%
July-December Biomass proportions	5%		10%		12%		28%		72%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	0.6	8.4	25.4	138.0	108.0	268.8	134.0	415.2	433.8	394.5	567.8	809.7
Biomass mt (age 3+)	550.8	566.2	1,094.9	1,062.3	1,132.5	1,117.7	2,778.2	2,746.3	7,583.2	7,705.6	10,361	10,452
Catch/Biomass	0.1%	1.5%	2.3%	13.0%	9.5%	24.0%	4.8%	15.1%	5.7%	5.1%	5.5%	7.7%
Annual Biomass proportions	7%		13%		16%		36%		64%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	1.1	11.2	41.5	222.3	286.3	504.0	328.9	737.5	649.5	738.3	978.4	1,475.8
Biomass mt (age 3+)	870.8	898.8	1,754.8	1,811.1	2,070.4	2,136.9	4,696.0	4,846.8	6,076.0	6,271.2	10,772	11,118
Catch/Biomass	0.1%	1.2%	2.4%	12.3%	13.8%	23.6%	7.0%	15.2%	10.7%	11.8%	9.1%	13.3%

Table III-7d

	Bering Sea and Aleutian Islands Area -- Pacific Cod											
January-June Biomass proportions	**0-10 nm** 15%		**10-20 nm** 21%		**Foraging Area** 12%		**CH Total** 49%		**Outside CH** 51%		**Total** 100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	16.2	8.7	34.0	36.1	21.1	18.0	71.3	62.8	61.4	65.6	132.7	128.4
Biomass mt (age 3+)	191.9	198.4	272.8	282.0	154.8	160.0	619.5	640.4	652.5	674.6	1,272	1,315
Catch/Biomass	8.4%	4.4%	12.5%	12.8%	13.6%	11.3%	11.5%	9.8%	9.4%	9.7%	10.4%	9.8%
July-December Biomass proportions	12%		17%		10%		38%		62%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	3.0	2.5	3.5	5.1	2.8	7.8	9.3	15.4	31.7	51.9	41.0	67.3
Biomass mt (age 3+)	133.8	146.3	179.2	184.3	99.8	107.0	412.8	437.7	726.5	748.9	1,139	1,187
Catch/Biomass	2.2%	1.7%	2.0%	2.8%	2.8%	7.3%	2.3%	3.5%	4.4%	6.9%	3.6%	5.7%
Annual Biomass proportions	13%		19%		11%		43%		57%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	19.2	11.2	37.5	41.2	23.9	25.8	80.6	78.2	93.1	117.5	173.7	195.7
Biomass mt (age 3+)	191.9	198.4	272.8	282.0	154.8	160.0	619.5	640.4	652.5	674.6	1,272	1,315
Catch/Biomass	10.0%	5.6%	13.7%	14.6%	15.4%	16.1%	13.0%	12.2%	14.3%	17.4%	13.7%	14.9%

Table III-7e

	Aleutian Islands – Atka Mackerel											
January-June Biomass proportions	**0-10 nm** 31%		**10-20 nm** 35%		**Foraging Area** 1%		**CH Total** 67%		**Outside CH** 33%		**Total** 100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	5.4	1.2	11.8	9.6	-	-	17.2	10.8	9.9	9.3	27.1	20.1
Biomass mt (age 3+)	182.8	119.6	206.1	134.8	5.0	3.3	394.0	257.6	194.0	126.9	588.0	384.5
Catch/Biomass	3.0%	1.0%	5.7%	7.1%	0.0%	0.0%	4.4%	4.2%	5.1%	7.3%	4.6%	5.2%
July-December Biomass proportions	31%		35%		1%		67%		33%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	2.4	0.2	10.8	10.5	-	-	13.2	10.7	15.9	14.3	29.1	25.0
Biomass mt (age 3+)	177.4	118.4	194.3	125.2	5.0	3.3	376.8	246.8	184.1	117.6	560.9	364.4
Catch/Biomass	1.4%	0.2%	5.6%	8.4%	0.0%	0.0%	3.5%	4.3%	8.6%	12.2%	5.2%	6.9%
Annual Biomass proportions	31%		35%		1%		67%		33%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt (thousands)	7.8	1.4	22.6	20.1	-	-	30.4	21.5	25.8	23.6	56.2	45.1
Biomass mt (age 3+)	182.8	119.6	206.1	134.8	5.0	3.3	394.0	257.6	194.0	126.9	588.0	384.5
Catch/Biomass	4.3%	1.2%	11.0%	14.9%	0.0%	0.0%	7.7%	8.3%	13.3%	18.6%	9.6%	11.7%

Table III-7f

	BSAI and GOA – Pollock, Pacific Cod, and Atka Mackerel											
	0-10 nm		10-20 nm		Foraging Area		CH Total		Outside CH		Total	
January-June	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002
Catch mt (thousands)	40.2	16.4	113.7	144.2	209.1	256.3	363.0	416.9	320.0	449.6	683.0	866.5
Biomass mt (age 3+)	1,596.0	1,522.5	2,742.8	2,672.2	2,311.4	2,371.1	6,650.2	6,565.8	7,278.8	7,362.7	13,929.0	13,928.5
Catch/Biomass	2.5%	1.1%	4.1%	5.4%	9.0%	10.8%	5.5%	6.3%	4.4%	6.1%	4.9%	6.2%
July-December	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002
Catch mt (thousands)	13.8	18.1	50.1	171.0	121.5	277.8	185.4	466.9	503.9	477.3	689.3	944.2
Biomass mt (age 3+)	1,165.6	1,110.8	1,884.0	1,769.7	1,302.2	1,290.7	4,351.8	4,171.2	8,894.2	8,890.8	13,246.0	13,062.0
Catch/Biomass	1.2%	1.6%	2.7%	9.7%	9.3%	21.5%	4.3%	11.2%	5.7%	5.4%	5.2%	7.2%
Annual	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002	1999	2002
Catch mt (thousands)	54.0	34.5	163.8	315.2	330.6	534.1	548.4	883.8	823.9	926.9	1,372.3	1,810.7
Biomass mt (age 3+)	1,596.0	1,522.5	2,742.8	2,672.2	2,311.4	2,371.1	6,650.2	6,565.8	7,278.8	7,362.7	13,929.0	13,928.5
Catch/Biomass	3.4%	2.3%	6.0%	11.8%	14.3%	22.5%	8.2%	13.5%	11.3%	12.6%	9.9%	13.0%

Table III-8 Forage required by Steller sea lions and groundfish biomass in Critical Habitat for the Eastern Bering Sea, Aleutian Island, and Gulf of Alaska.

	Annual estimate of forage required (metric tons)	Groundfish biomass estimates in 2000	Percent required (multiplier) [theoretical 22-46]
Eastern Bering Sea	41,508	18,517,619	0.2% **(446)**
Aleutian Islands	130,296	1,468,608	9% **(11)**
Gulf of Alaska	213,695	3,630,482	6% **(17)**

Table III-9 Catch of pollock in the EBS around St. Goerge Island from 1999 to 2002. Amounts are in mt.

Pollock catch near St. George Island (Pribilofs) from 1999 and 2002 (mt)							
Date	0-3	3-10	*0-10*	10-20	0-20 Total	EBS Pollock Fishery Total	% 0-20
1999	0	0	*0*	3,736	3,736	965,931	0.39%
2002	0	2,346	*2,346*	27,893	30,239	1,460,227	2.07%

Observed, directed pollock trawl hauls in the vicinity of St. George Island (Dalnoi Pt. and South Rookery). Observed totals have been expanded up to the Blend total to estimate the amount of the total catch in this area. The values used to expand the observer data are provided as well as the actual, raw observed amount.

Figure I-1 Counts of adult and juvenile Steller sea lions in the western DPS (by region) from the late 1970s to 2002 (Sease and Gudmundson in review).

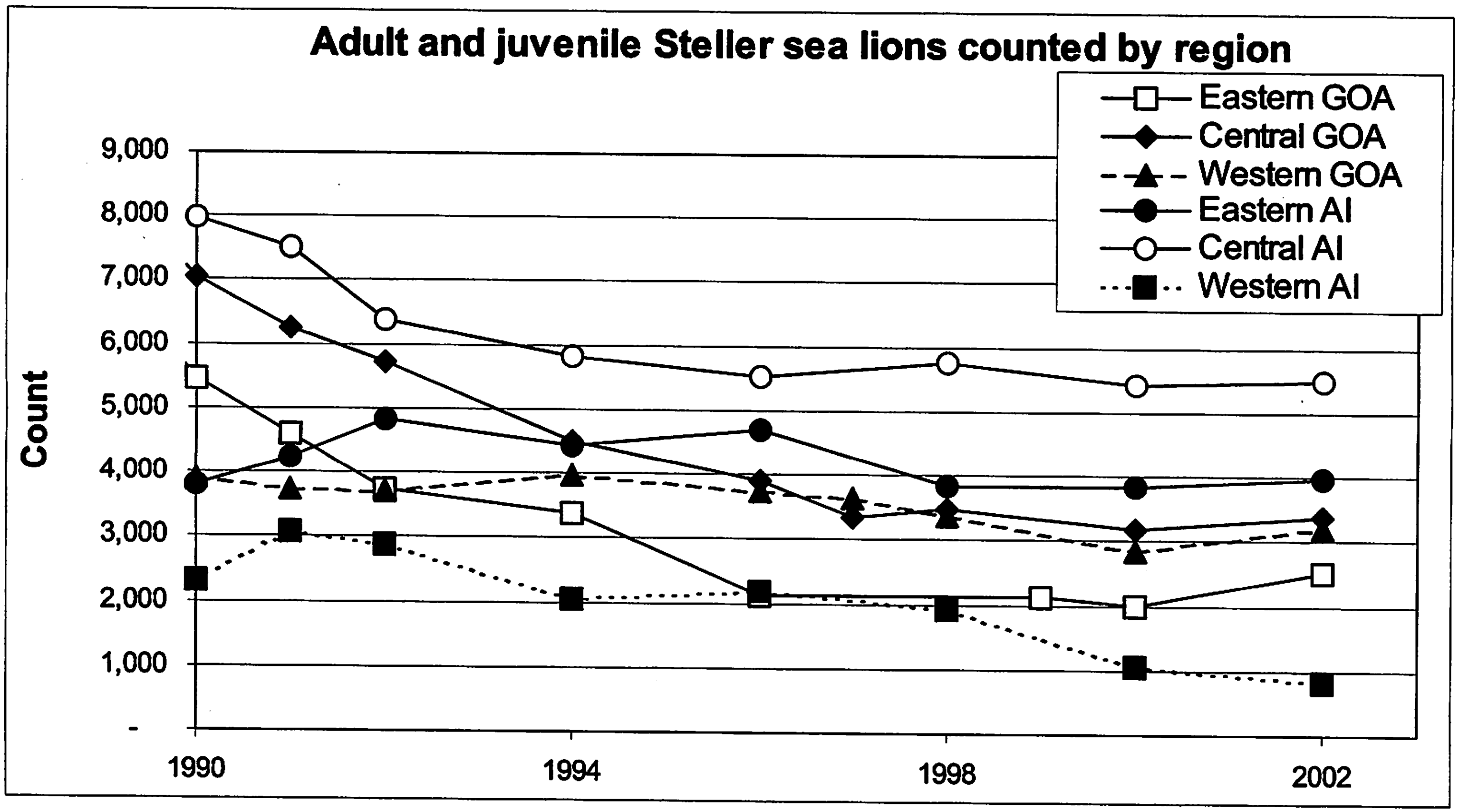


Figure I-2 Counts of adult and juvenile Steller sea lions in the western DPS at trend sites from Kenai to Kiska from the late 1970s to 2002 (Sease and Gudmundson in review).

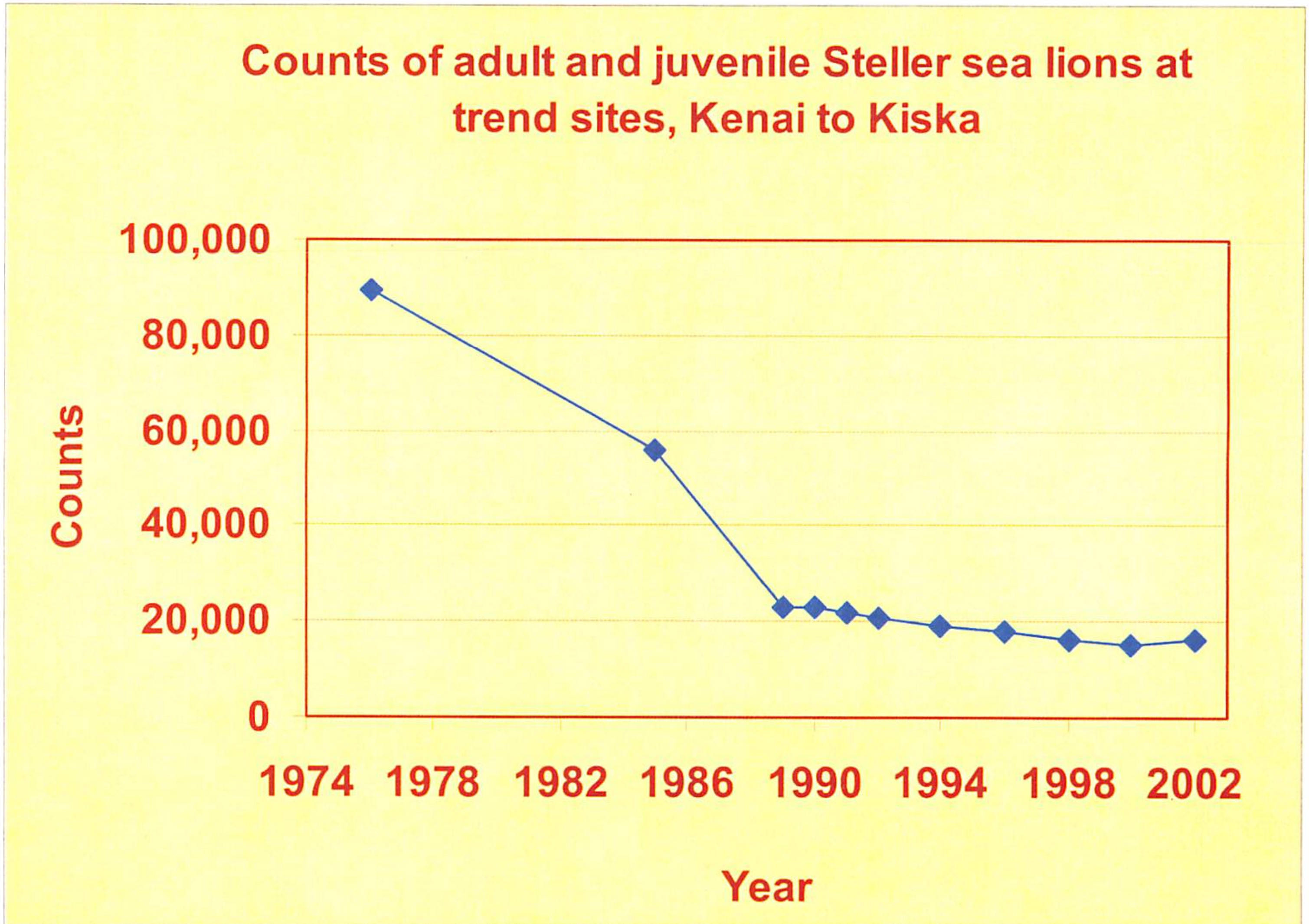
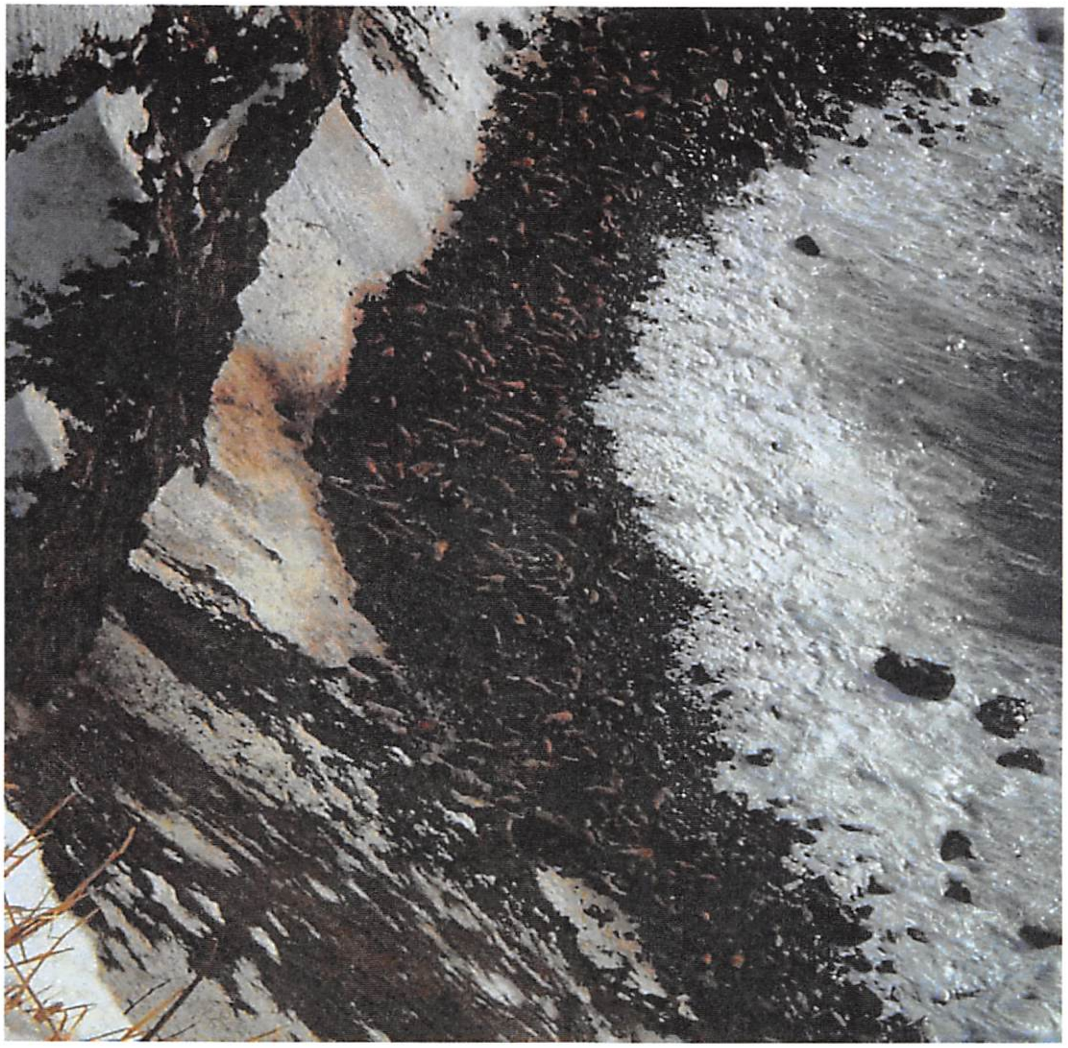


Figure I-3 Photograph of Steller sea lions at Dalnoi Point, St. George Island 2002 (Kent Sudseth, pers. comm.).



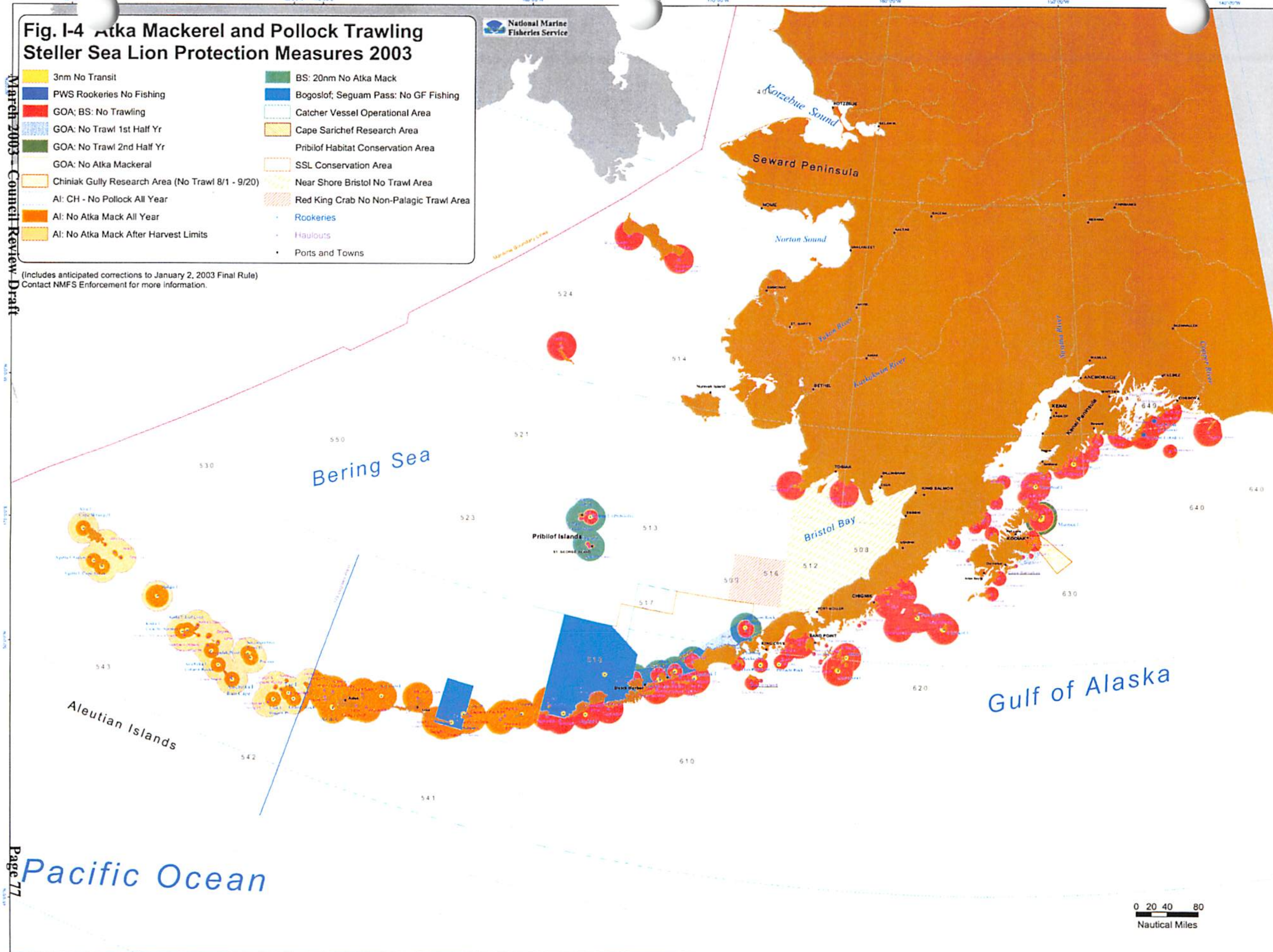


Fig. I-4 Atka Mackerel and Pollock Trawling
Steller Sea Lion Protection Measures 2003
3nm No Transit
PWS Rookeries No Fishing
GOA; BS: No Trawling
GOA: No Trawl 1st Half Yr
GOA: No Trawl 2nd Half Yr
GOA: No Atka Mackeral
Chiniak Gully Research Area (No Trawl 8/1 - 9/20)
AI: CH - No Pollock All Year
AI: No Atka Mack All Year
AI: No Atka Mack After Harvest Limits
BS: 20nm No Atka Mack
Bogoslof; Seguam Pass: No GF Fishing
Catcher Vessel Operational Area
Cape Sarichef Research Area
Pribilof Habitat Conservation Area
SSL Conservation Area
Near Shore Bristol No Trawl Area
Red King Crab No Non-Palagic Trawl Area
Rookeries
Haulouts
Ports and Towns
(Includes anticipated corrections to January 2, 2003 Final Rule)
Contact NMFS Enforcement for more information.
National Marine Fisheries Service
Kotzebue Sound
Seward Peninsula
Norton Sound
Bering Sea
Pribilof Islands
Bristol Bay
Gulf of Alaska
Aleutian Islands
Pacific Ocean
0 20 40 80
Nautical Miles

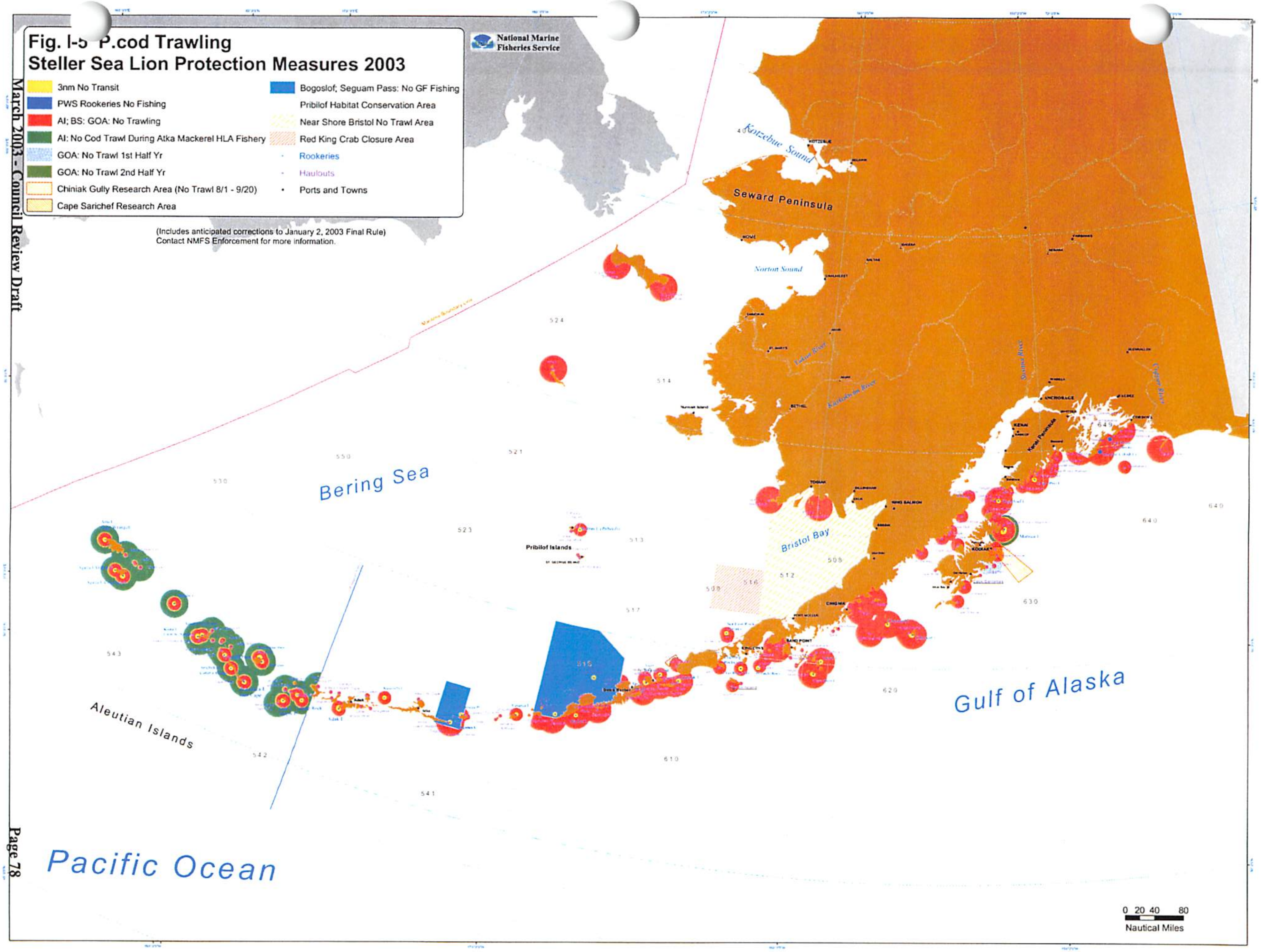


Fig. I-5 P.cod Trawling
Steller Sea Lion Protection Measures 2003

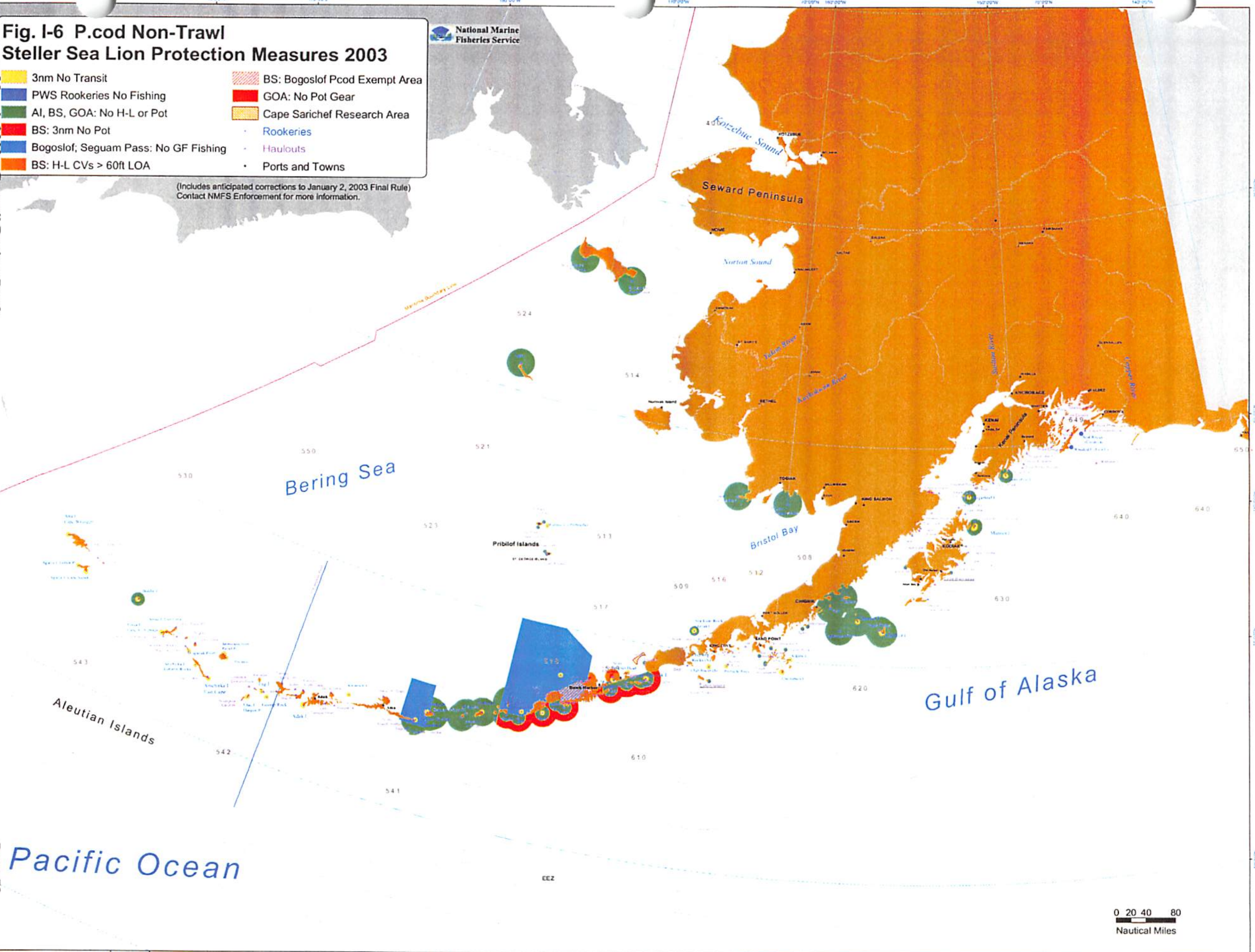
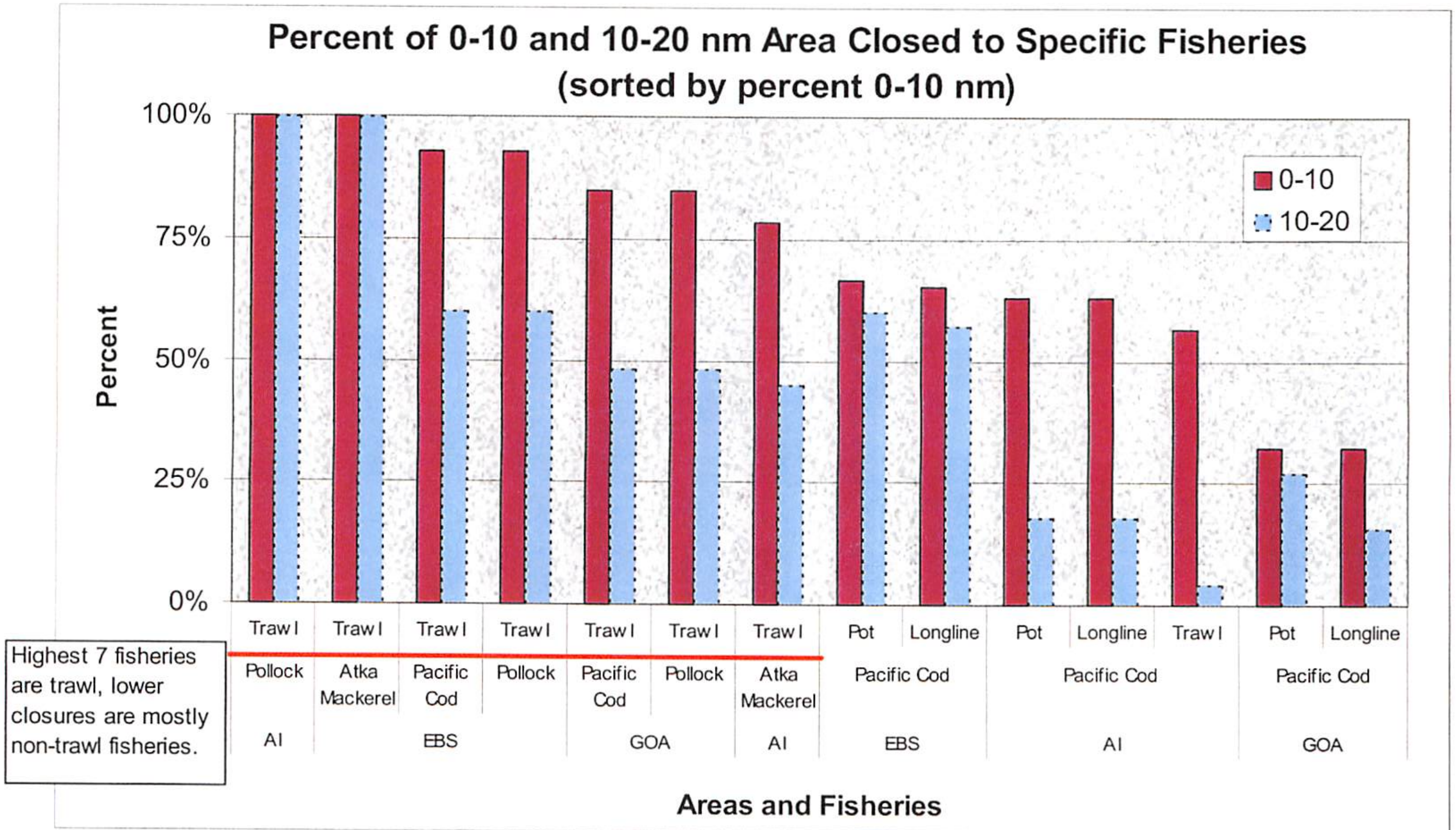


Fig. I-6 P.cod Non-Trawl
Steller Sea Lion Protection Measures 2003
3nm No Transit
PWS Rookeries No Fishing
AI, BS, GOA: No H-L or Pot
BS: 3nm No Pot
Bogoslof; Seguam Pass: No GF Fishing
BS: H-L CVs > 60ft LOA
BS: Bogoslof Pcod Exempt Area
GOA: No Pot Gear
Cape Sarichef Research Area
Rookeries
Haulouts
Ports and Towns
(Includes anticipated corrections to January 2, 2003 Final Rule)
Contact NMFS Enforcement for more information.
National Marine Fisheries Service
Kotzebue Sound
Seward Peninsula
Norton Sound
Bering Sea
Pribilof Islands
Bristol Bay
Gulf of Alaska
Aleutian Islands
Pacific Ocean
EEZ
524
514
521
550
530
523
513
508
512
516
509
517
518
543
542
541
610
620
630
640
649
650
0 20 40 80
Nautical Miles

Figure I-7 The amount of area closed in the BSAI and GOA under the Steller sea lion conservation measures as a percentage of each zone from 0-10 nm and 10-20 nm. The data is sorted as descending from 100% for the 0-10 nm zone, then the associated 10-20 nm percentage is plotted (data is from Table I-11).



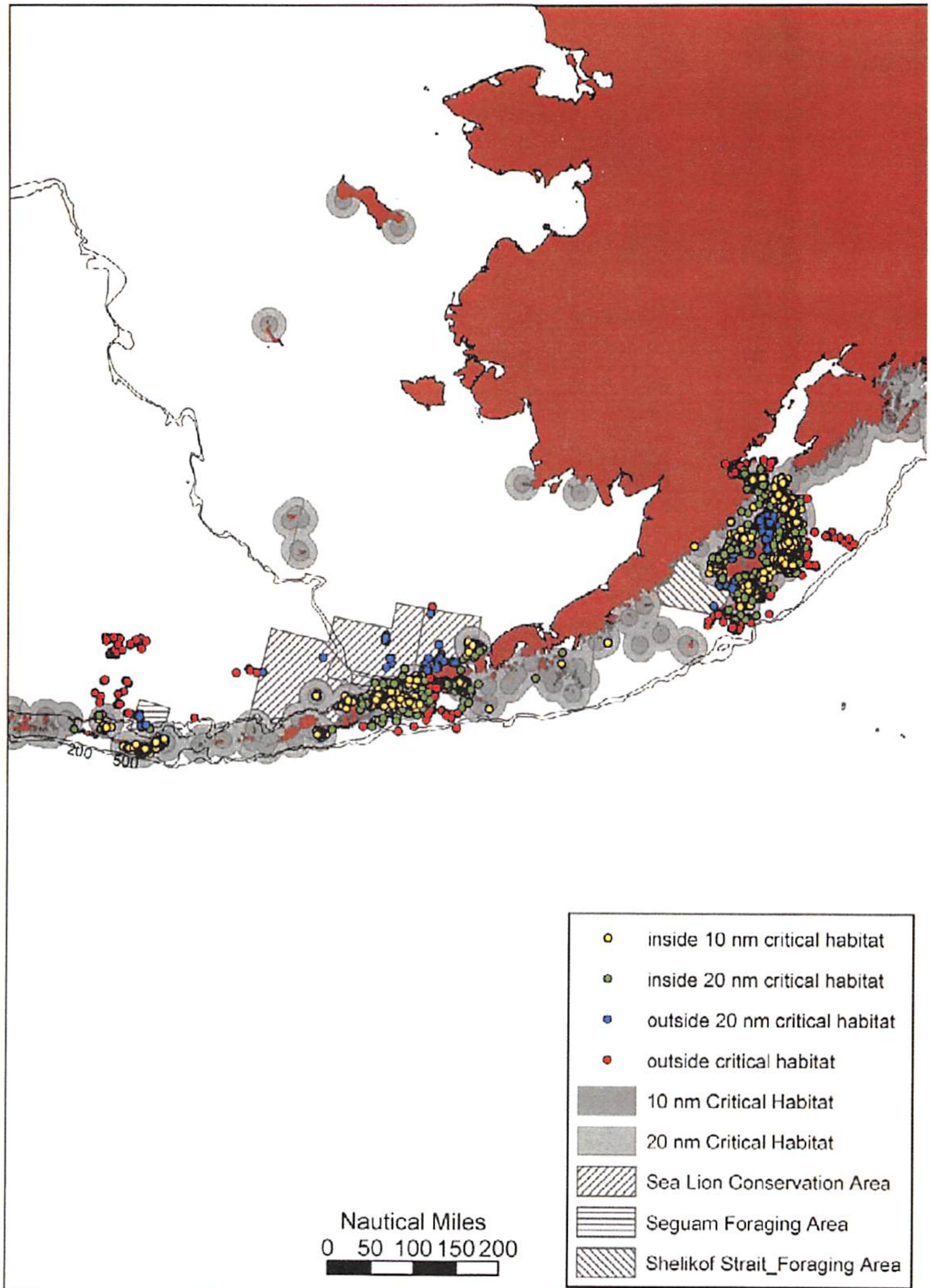


Figure II-1 Locations associated with dives to greater than 4 meters recorded for 63 juvenile Steller sea lions in 2000-2002.

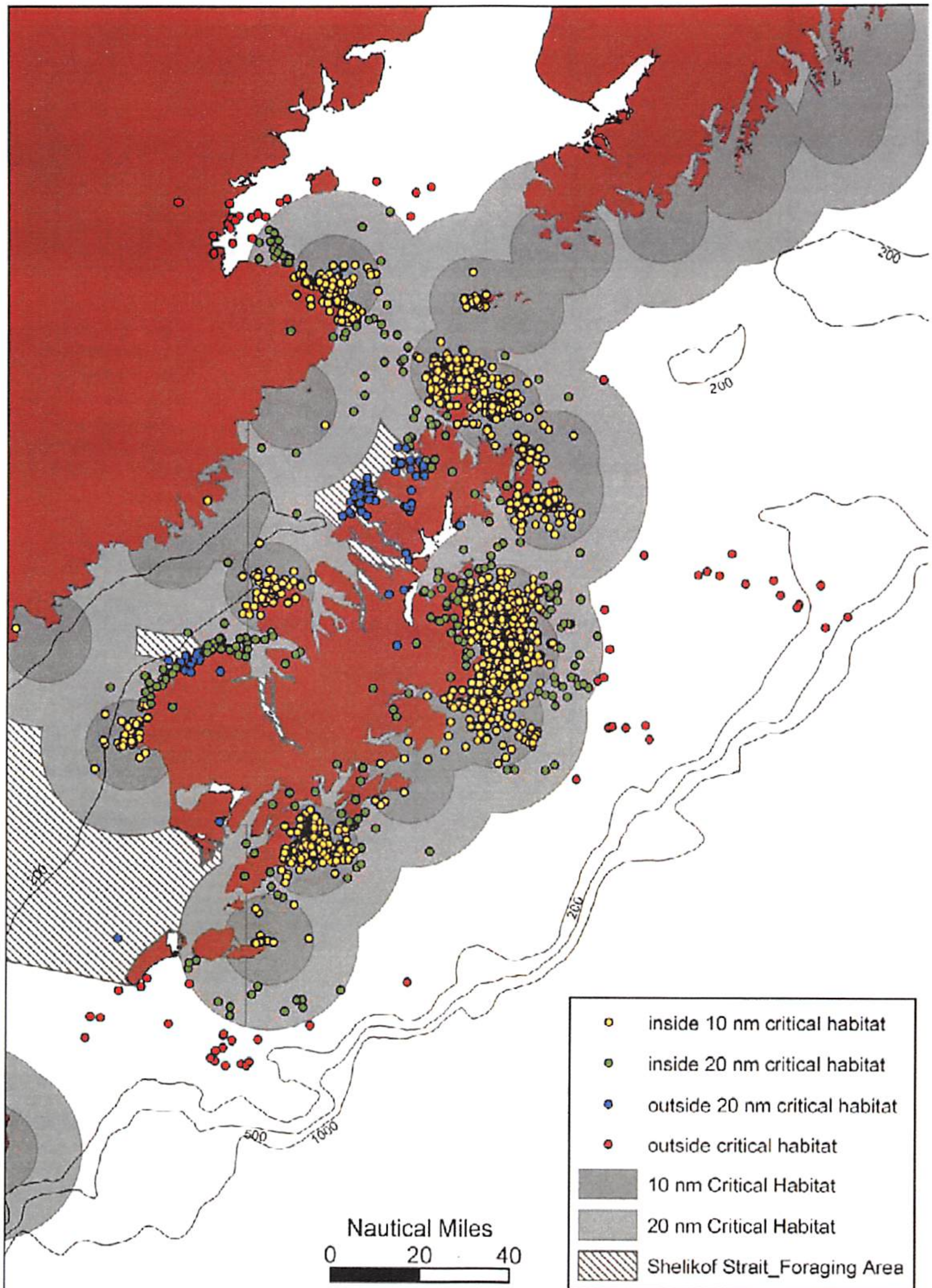


Figure II-2a Locations associated with dives to greater than 4 meters during summer (April-September) recorded for juvenile Steller sea lions in the Kodiak area during 2000-2002.

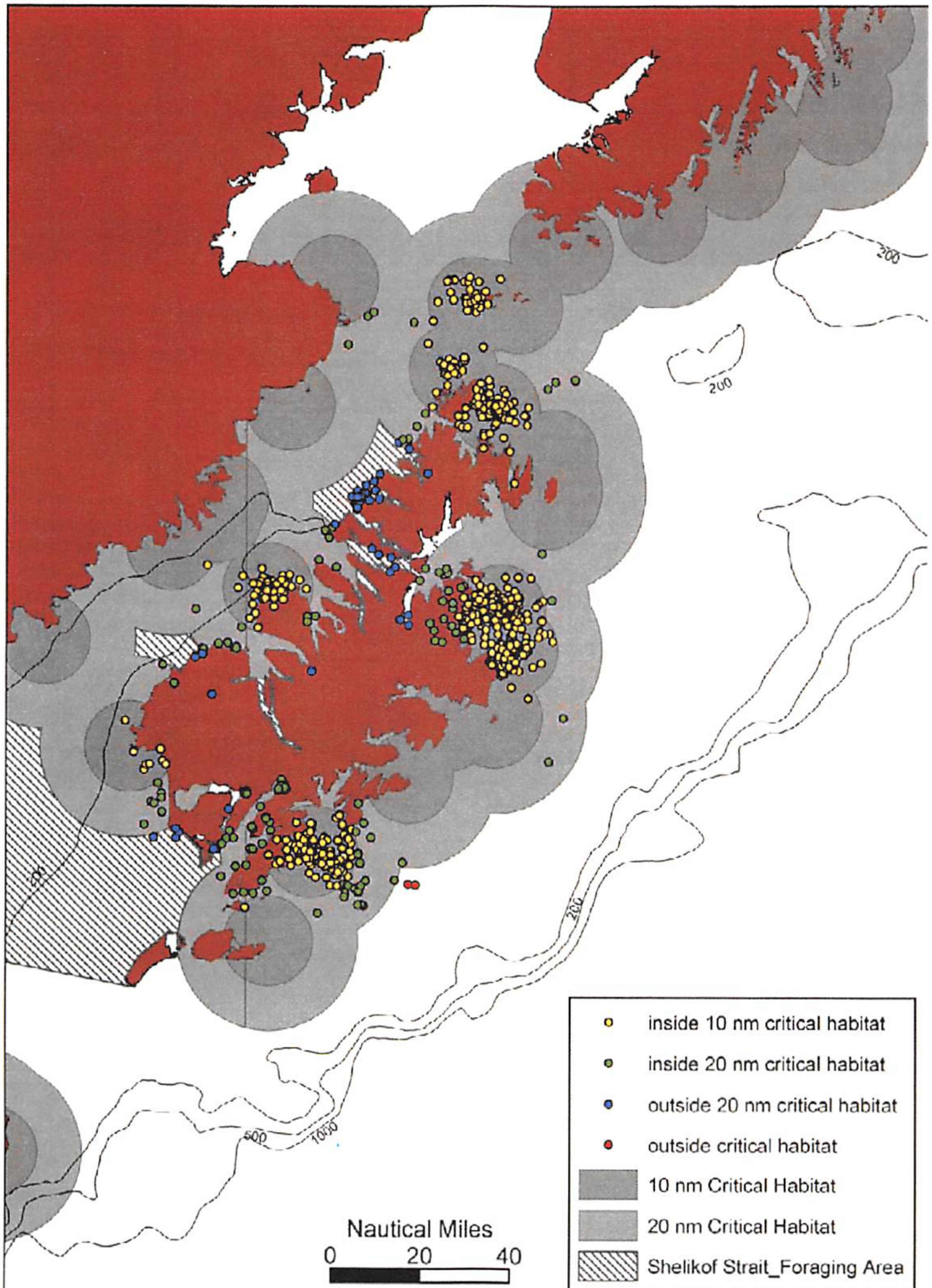


Figure II-2b Locations associated with dives to greater than 4 meters during winter (October-March) recorded for juvenile Steller sea lions in the Kodiak area during 2000-2002.

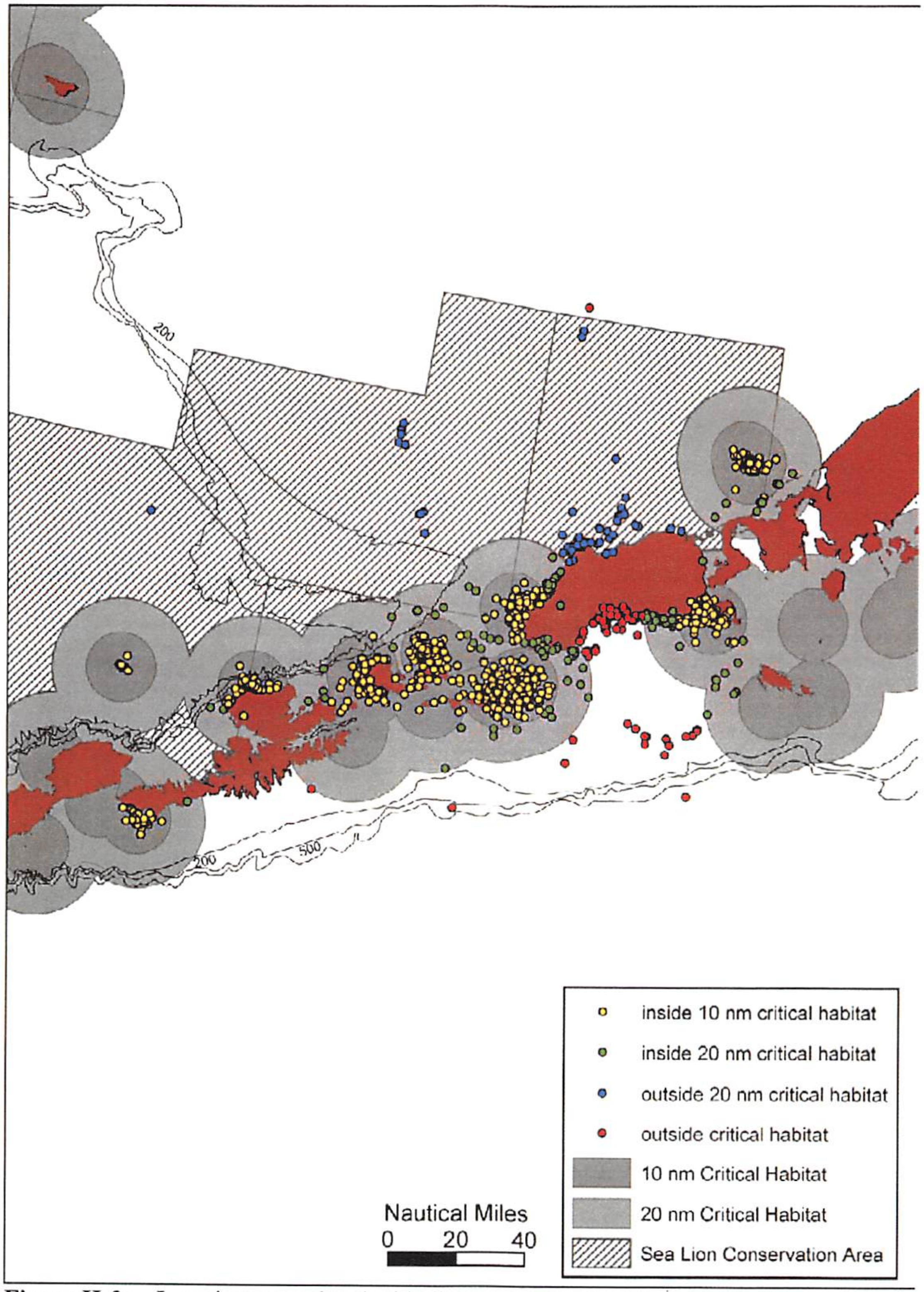


Figure II-3a Locations associated with dives to greater than 4 meters during summer (April-September) recorded for juvenile Steller sea lions in the Eastern Aleutians area during 2000-2002.

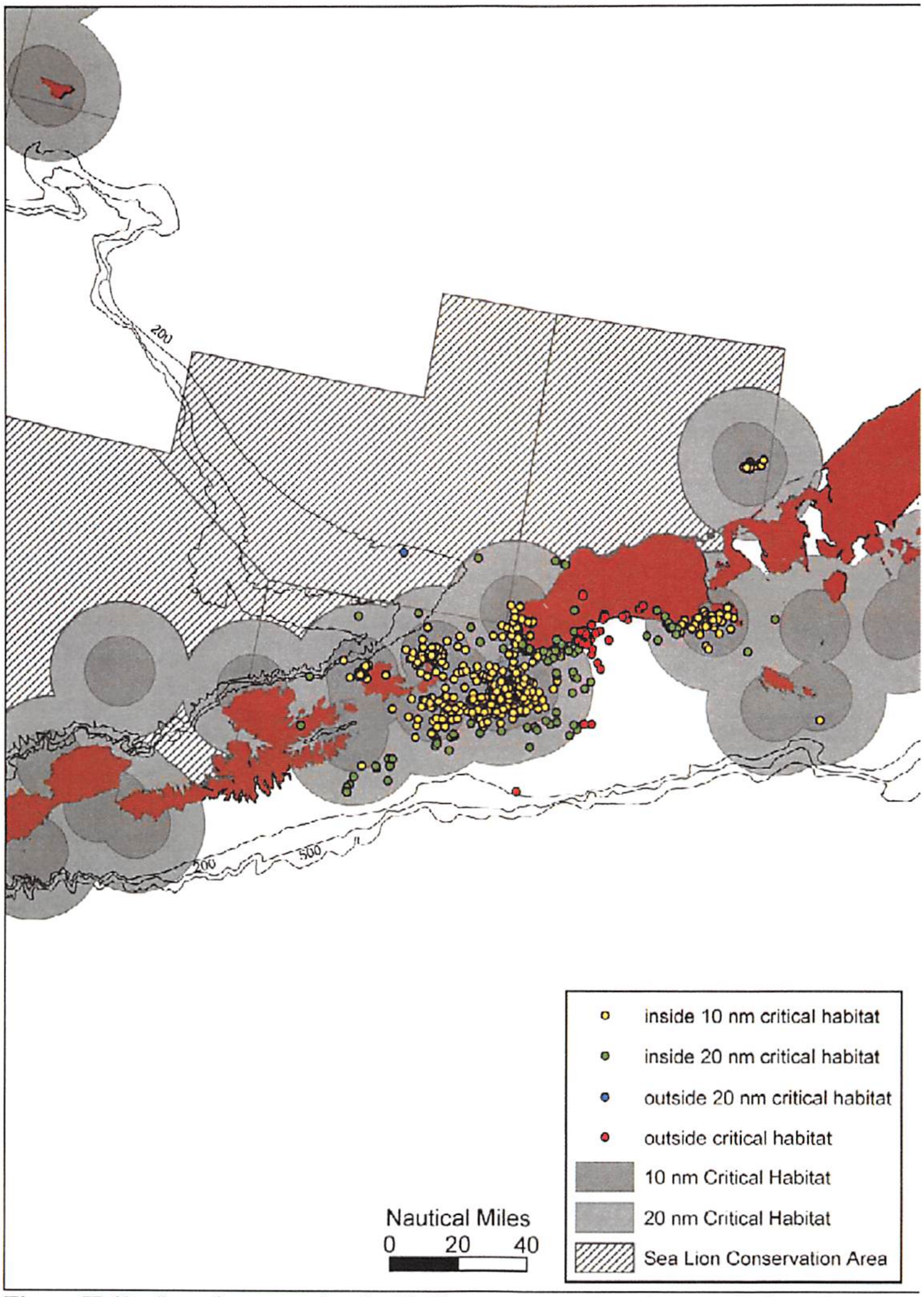


Figure II-3b Locations associated with dives to greater than 4 meters during winter (October-March) recorded for juvenile Steller sea lions in the Eastern Aleutians area during 2000-2002.

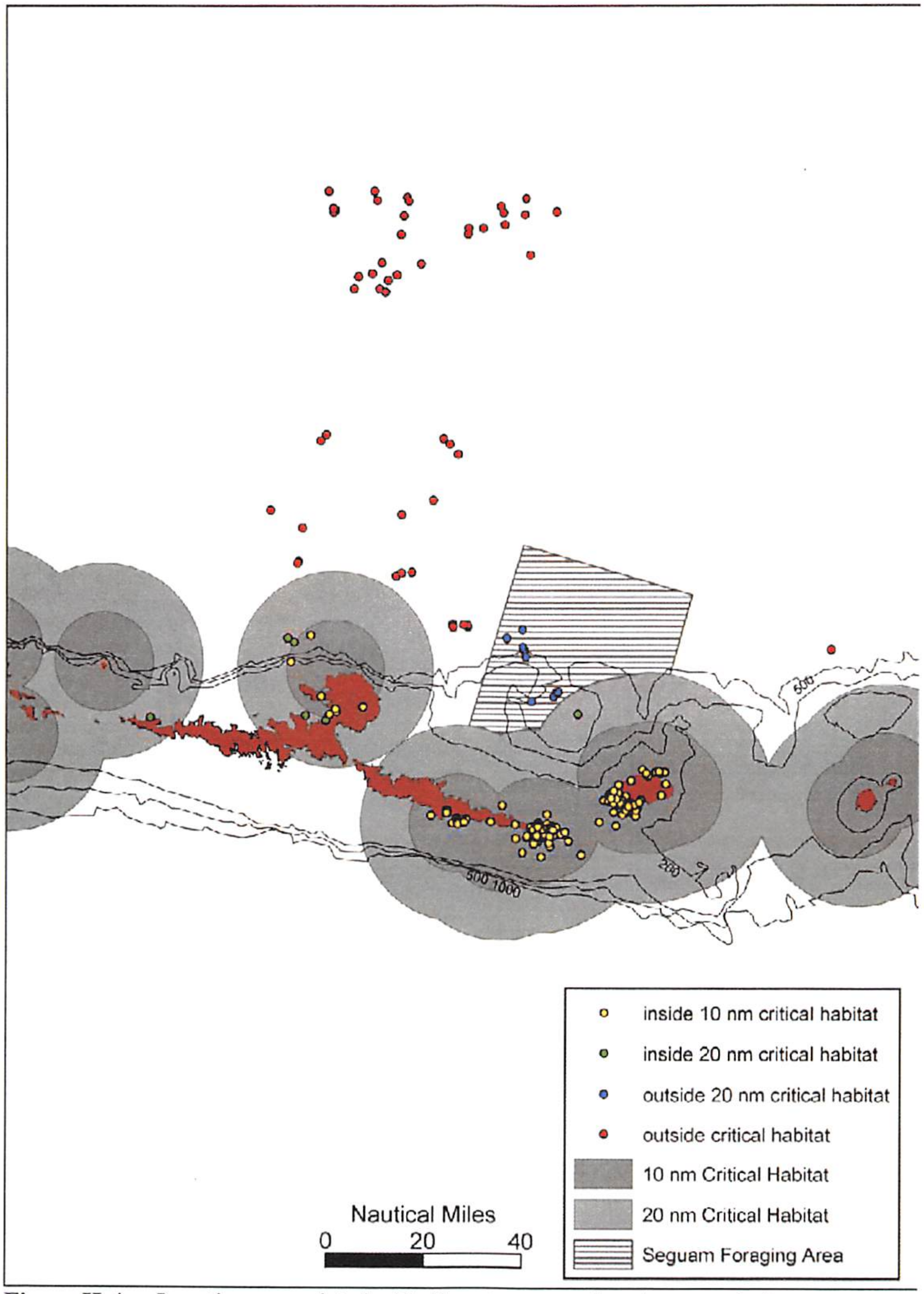


Figure II-4a Locations associated with dives to greater than 4 meters during summer (April-September) recorded for juvenile Steller sea lions in the Central Aleutians area during 2000-2002.

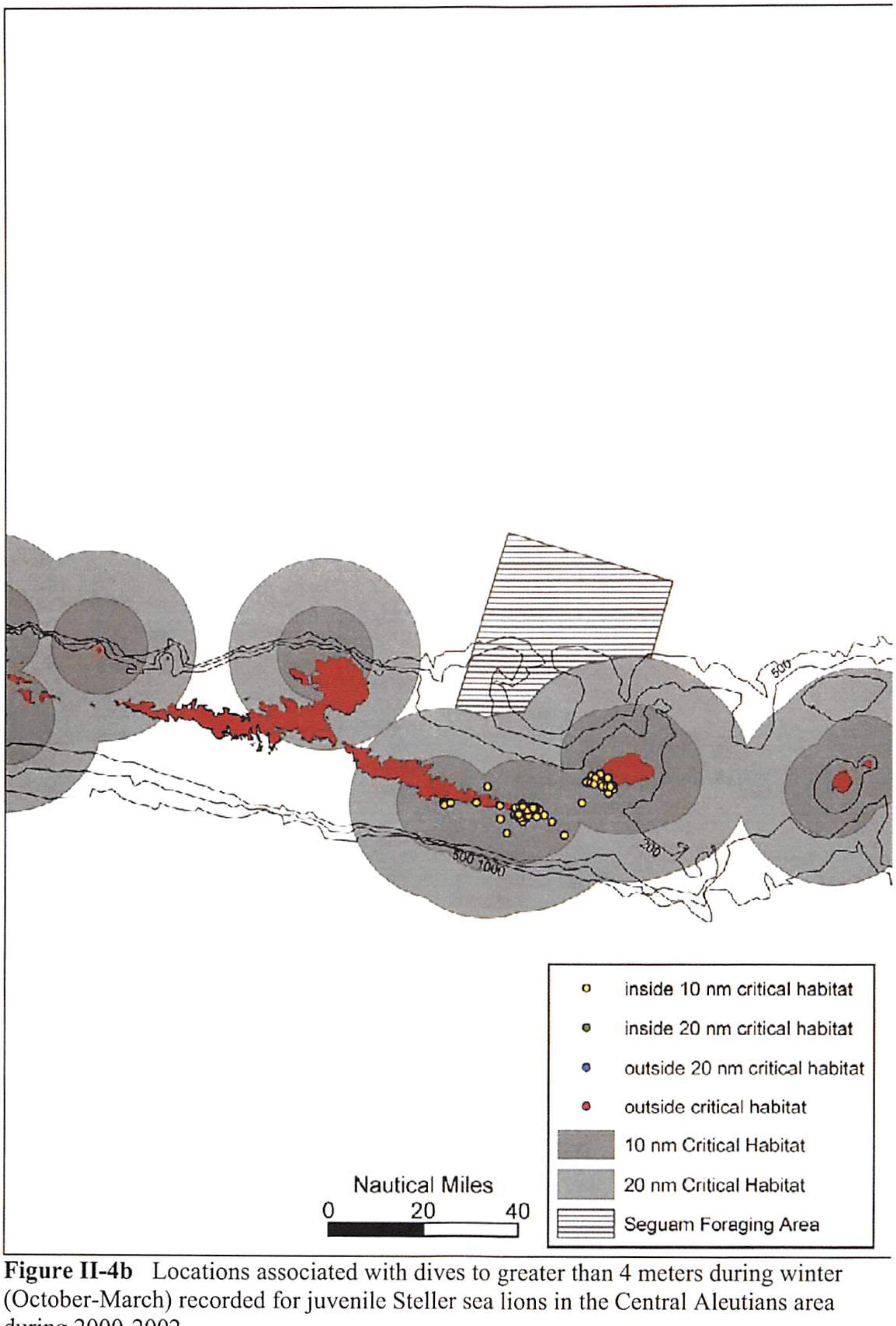


Figure II-4b Locations associated with dives to greater than 4 meters during winter (October-March) recorded for juvenile Steller sea lions in the Central Aleutians area during 2000-2002.

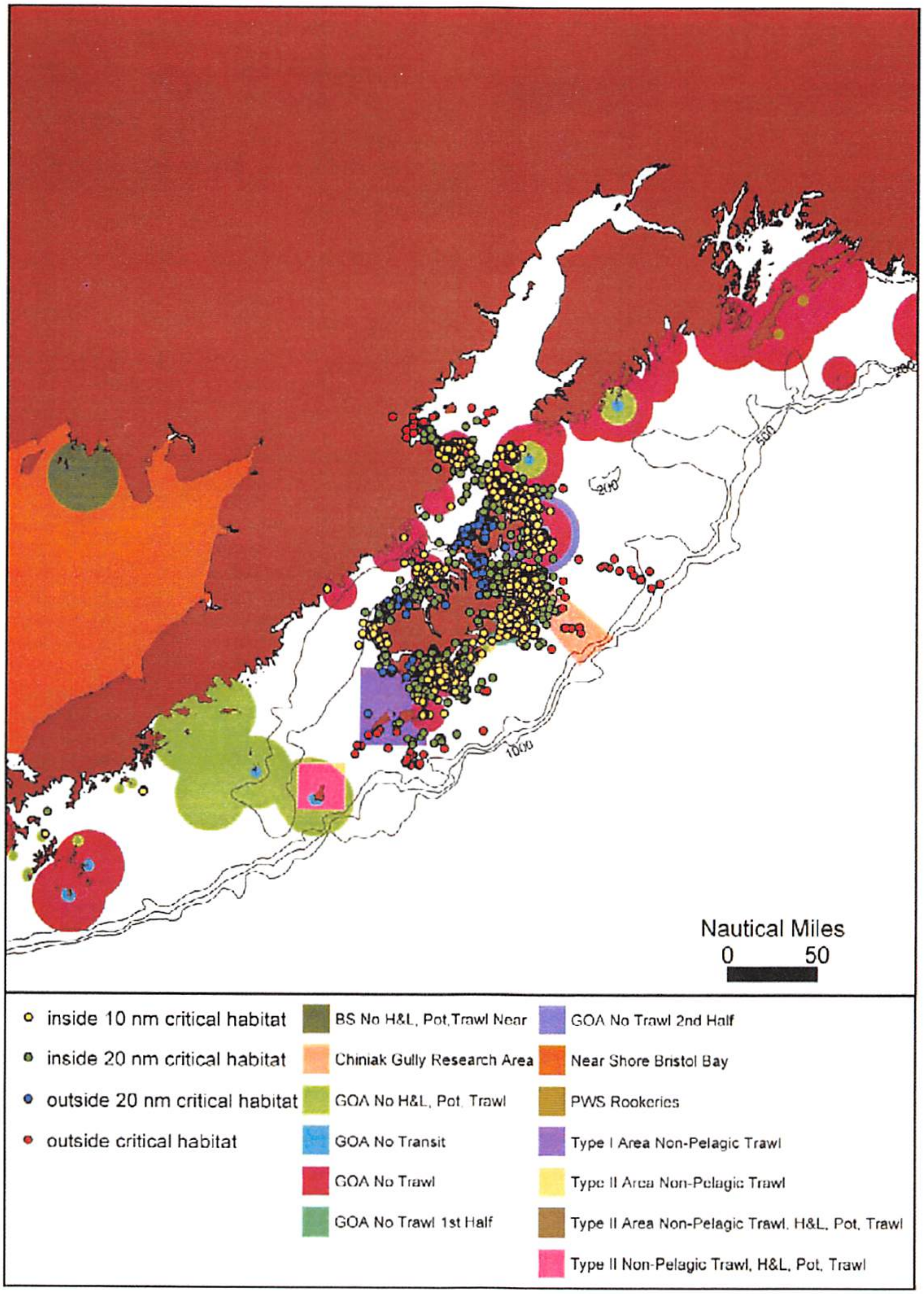


Figure II-5 Locations associated with dives to greater than 4 meters recorded for juvenile Steller sea lions in the Kodiak area during 2000-2002 overlaid with the current fisheries management zones.

Figure II-6 10nm Buffer Around Steller Sea Lion Haulouts and the Coast of Alaska

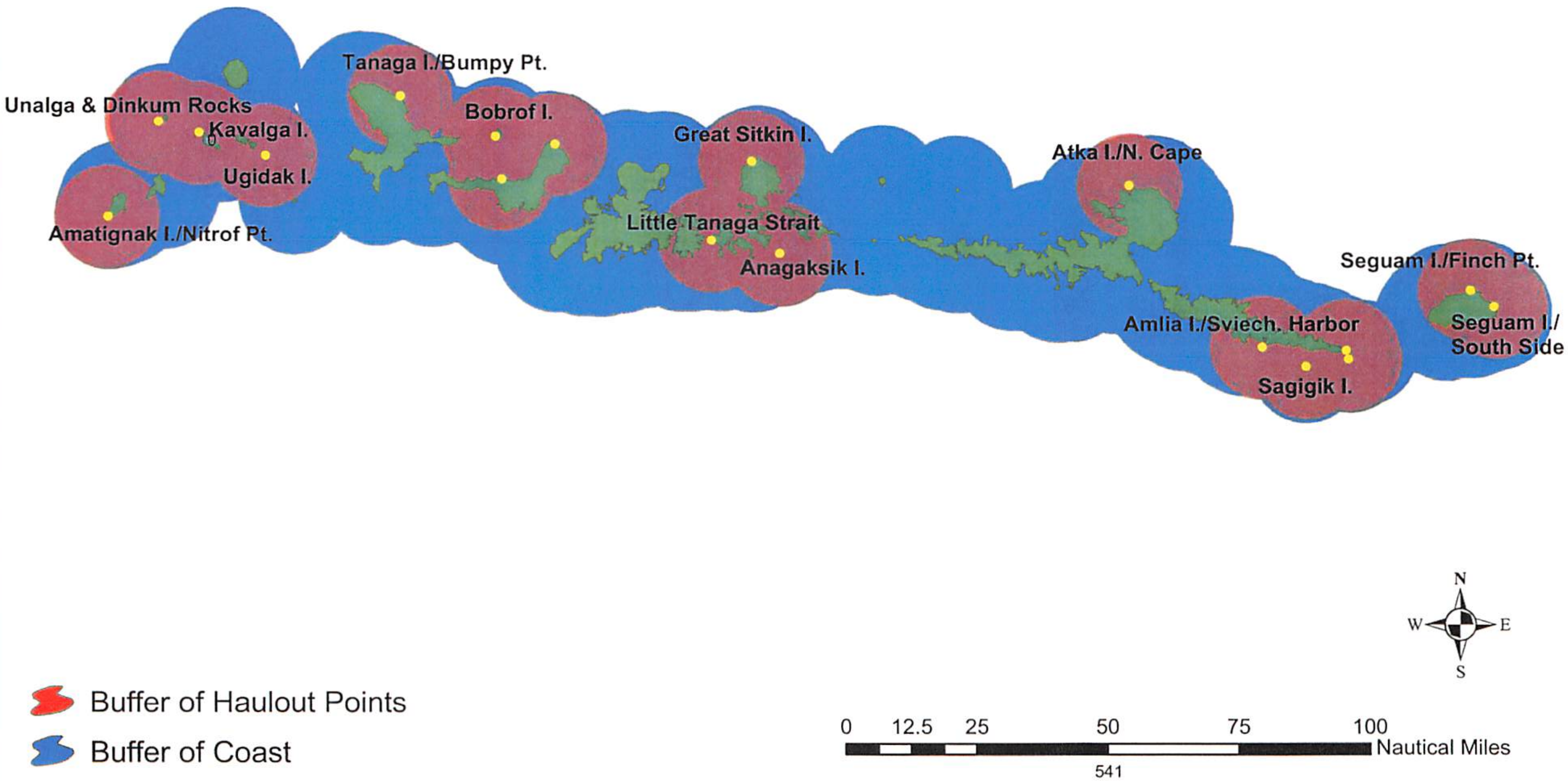
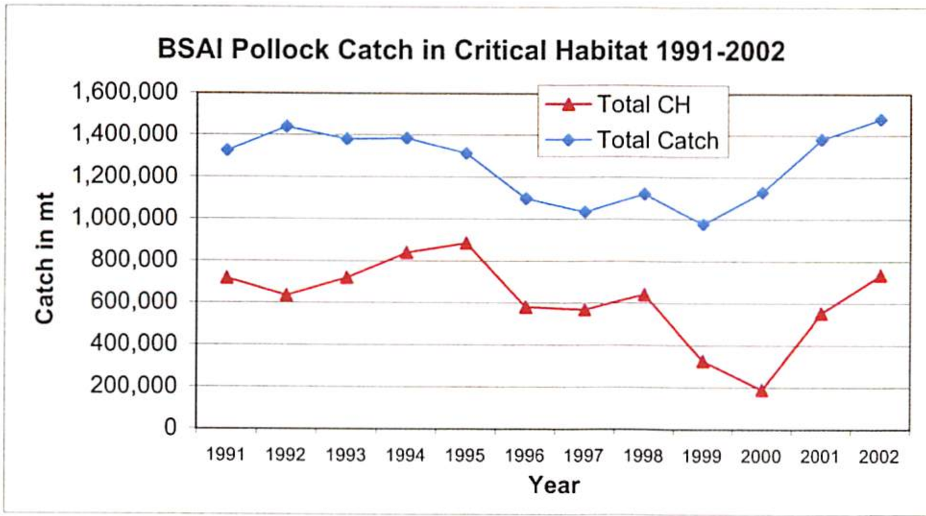
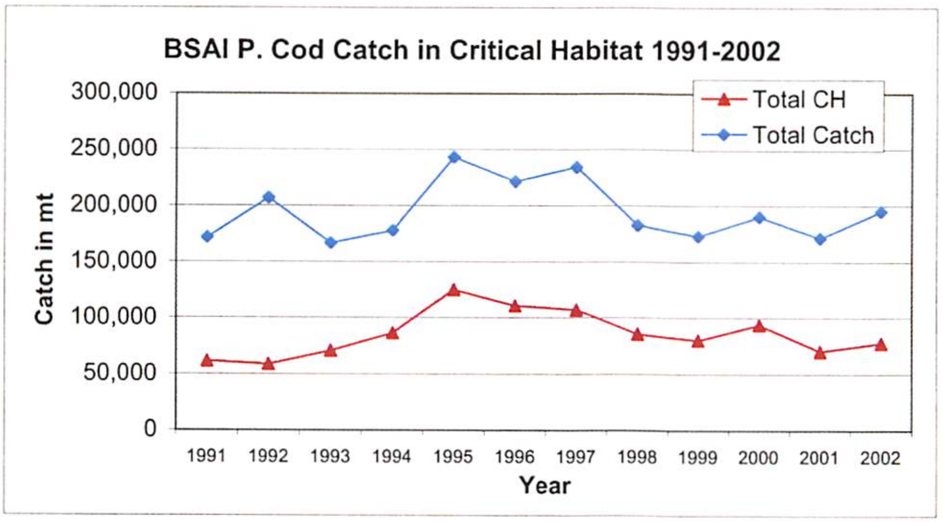


Figure III-1 BSAI catch in critical habiatat and biomass of pollock, P. cod, and Atka mackerel 1991-2002.





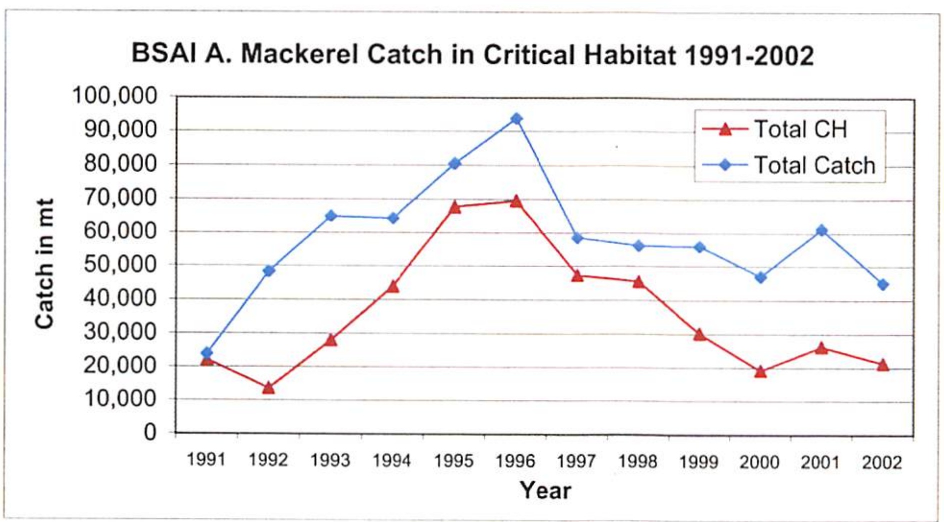
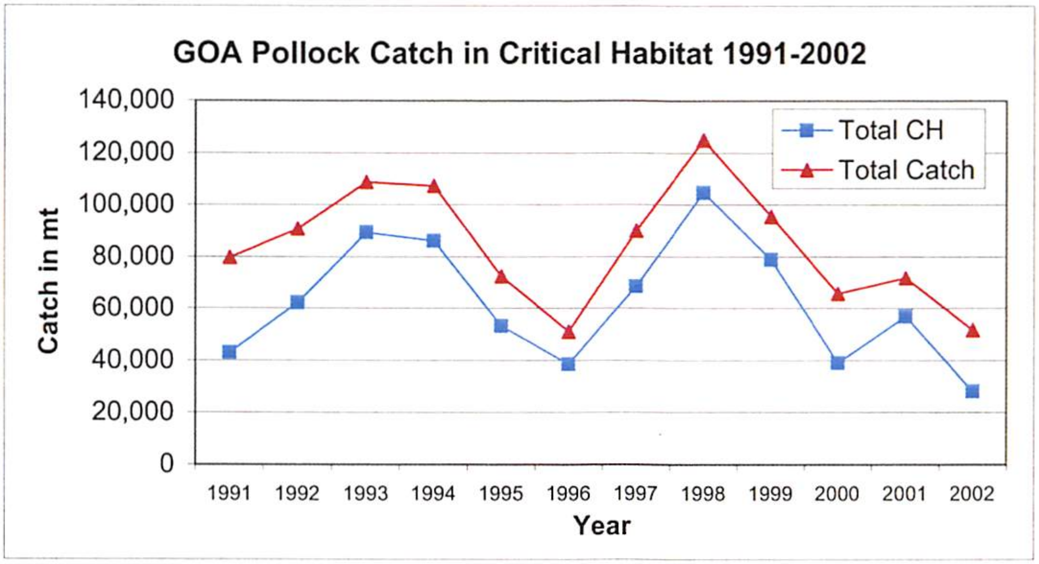


Figure III-2 GOA catch in critical habiatat and biomass of pollock and P. cod 1991-2002.



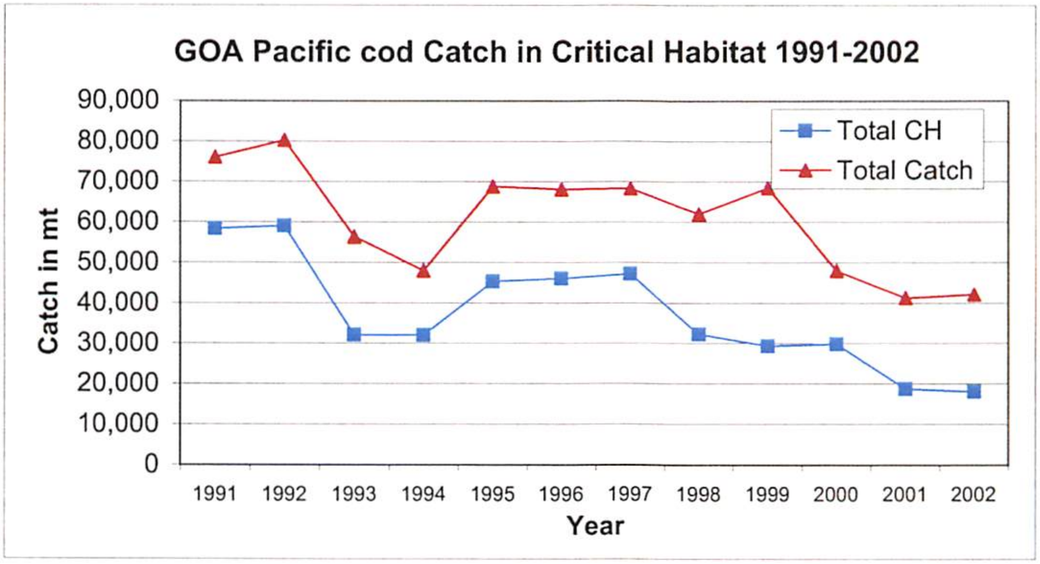
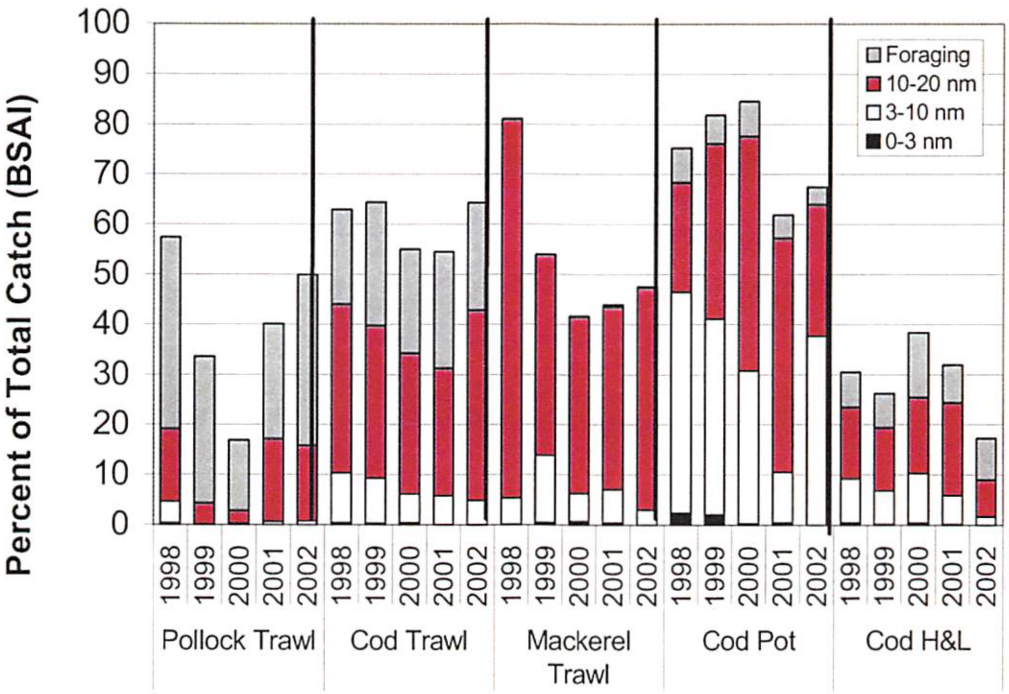


Figure III-3 Amount of catch within 0-3 nm, 3-10 nm, and 10-20 nm of critical habitat in the BSAI and GOA by gear types from 1998-2002.



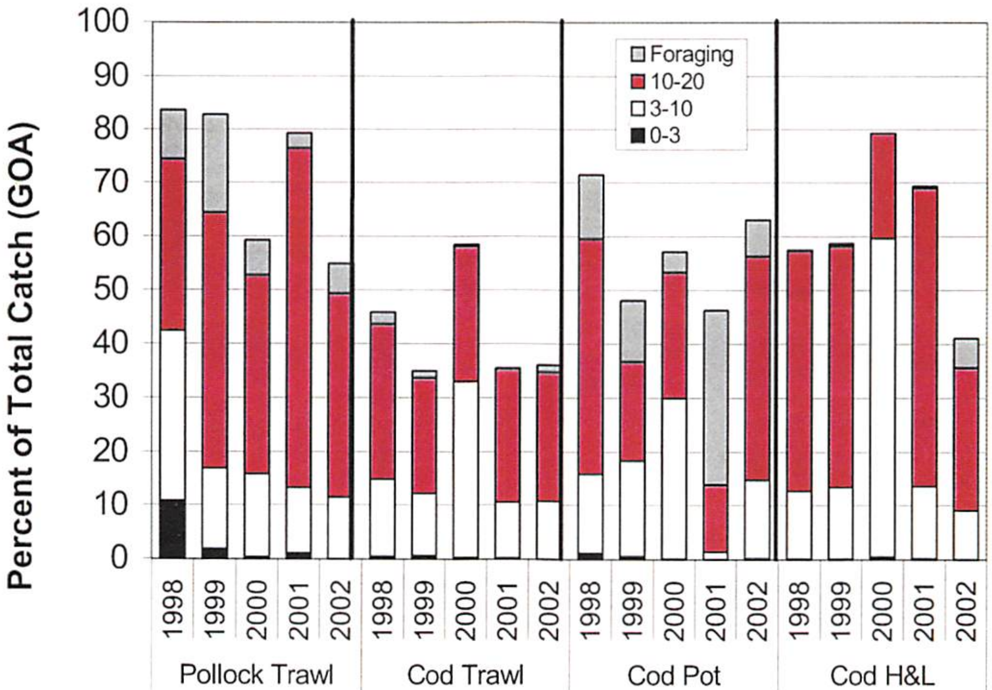
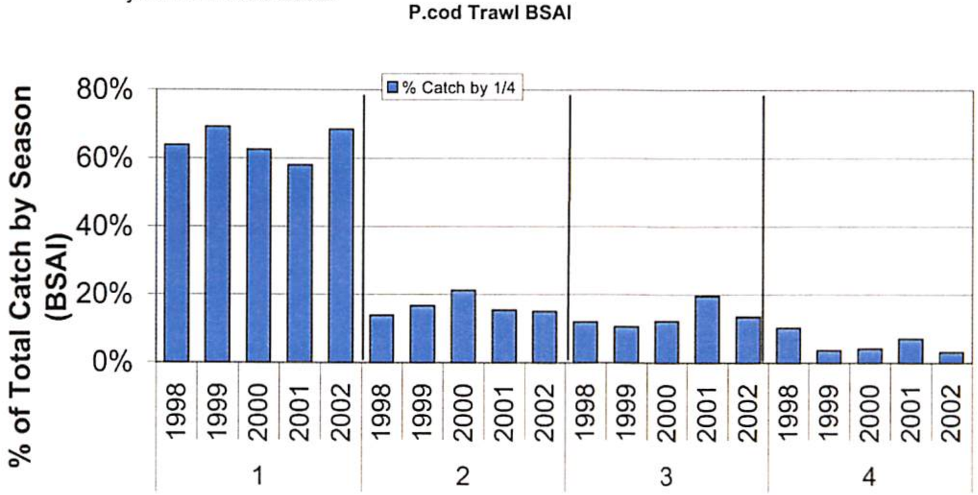
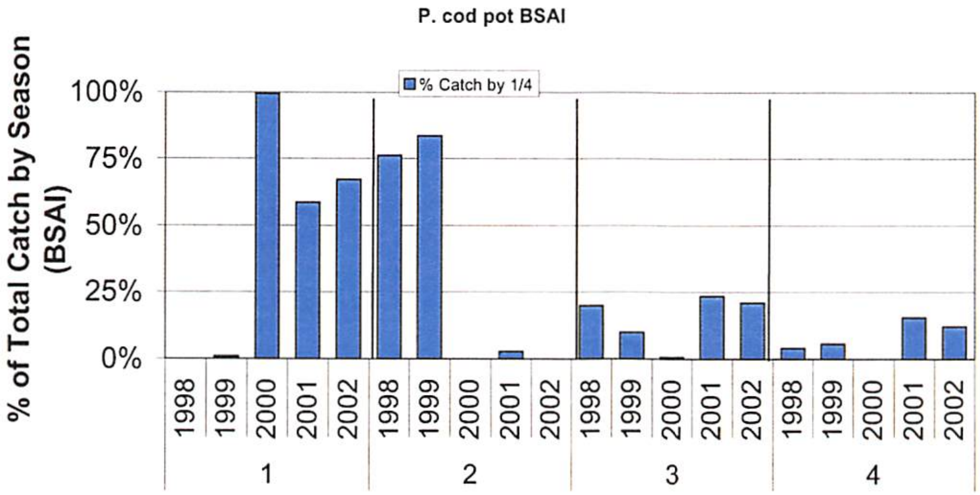


Figure III-4 Percent of the BSAI annual catch of Pacific cod harvested in each quarter of the year from 1998-2002.





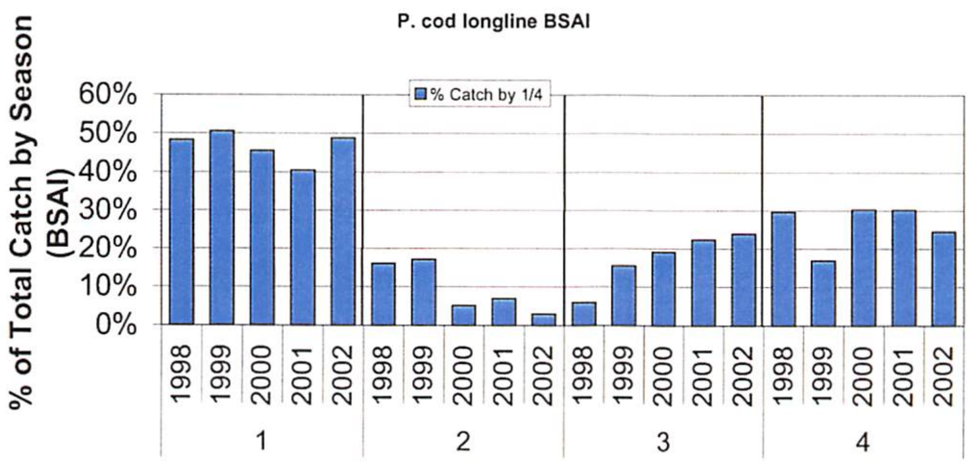
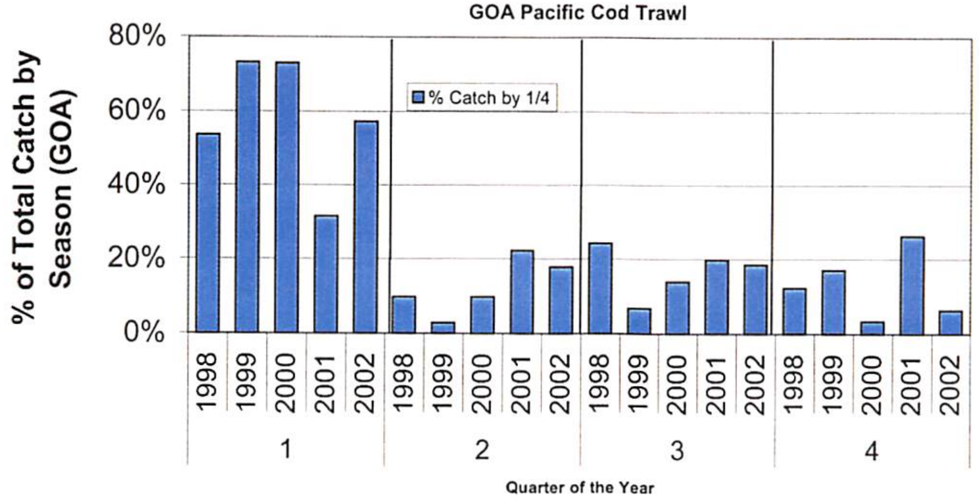
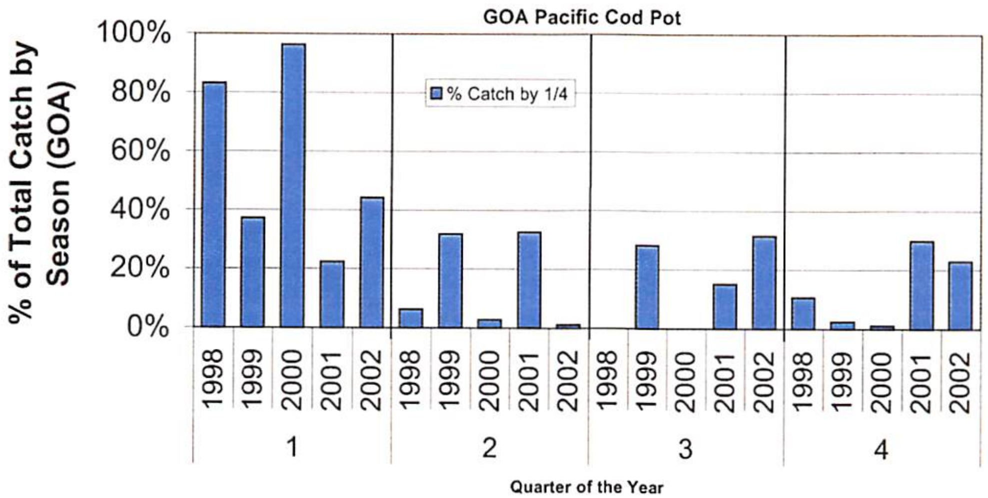


Figure III-5 Percent of the GOA annual catch of Pacific cod harvested in each quarter of the year from 1998-2002.





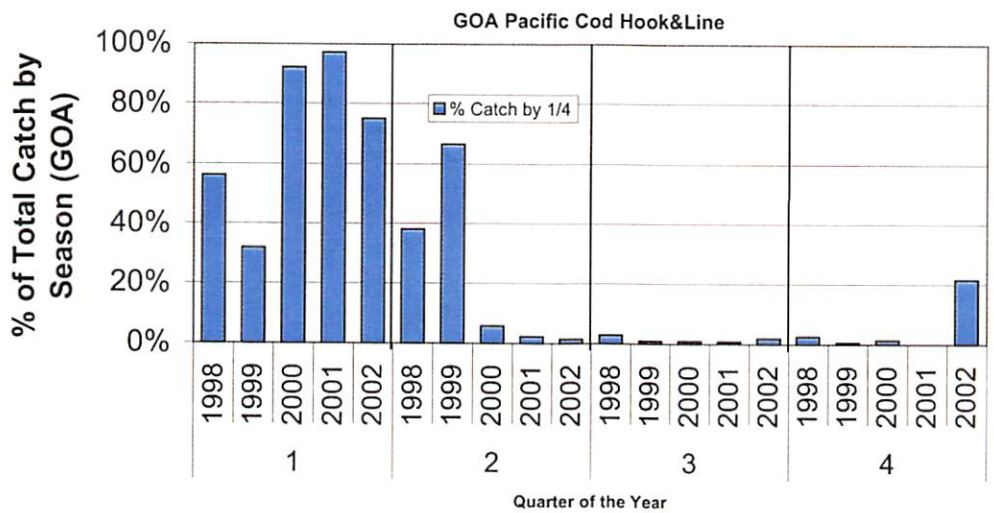
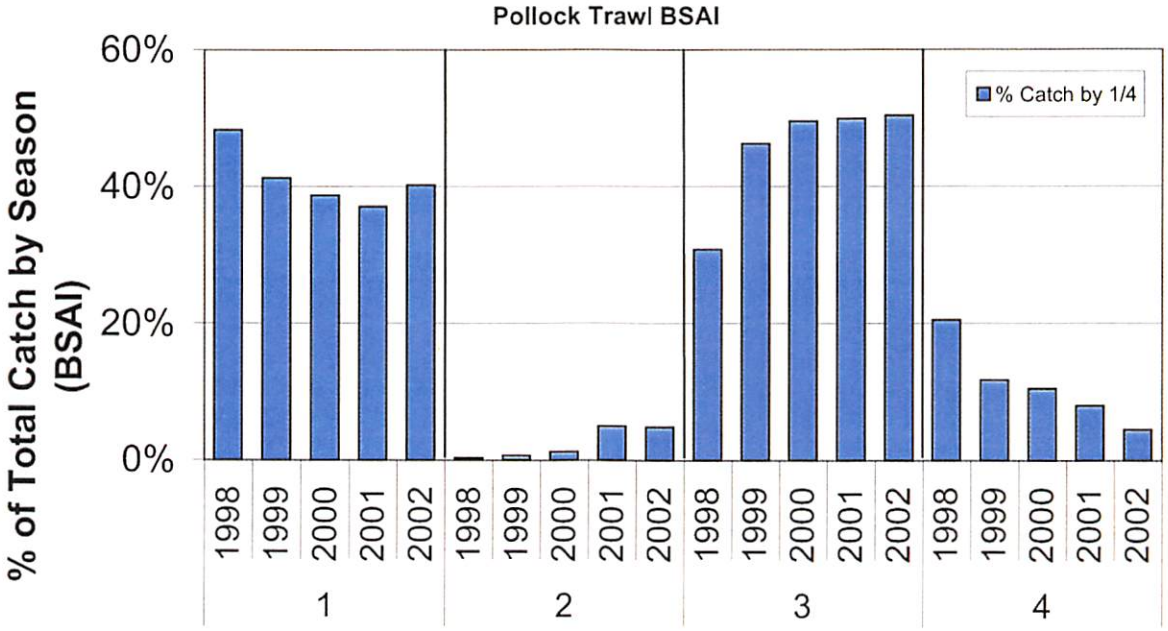
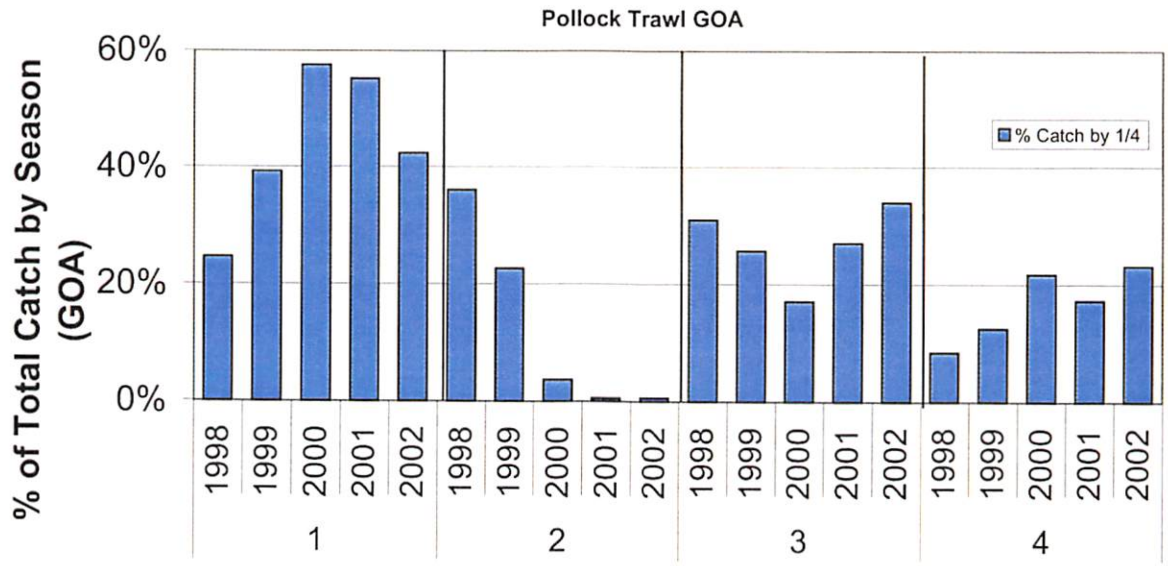


Figure III-6 Percent of the BSAI and GOA annual catch of pollock harvested in each quarter of the year from 1998-2002.





Appendix I – Telemetry Data Filtered based on Dives by Juveniles

A. Data analysis

A program was written based on the type of data used. We defined maximum dive-depth data as type 0. These were dive records within the depth bins showing maximum depth that was achieved during a dive. Thus, for a six-hour period, data type 0 provides the number of times a dive was made to a depth specified by a maximum depth bin. Data type 1 were the dive duration data binned according to dive times, and are not useful in discriminating dives to particular depths. Data type 1 were thus not used for this analysis. Time-at-depth bins (data type 2) coincide with the depth-bins, except that the first bin records the proportion of time during which the sensors were dry, and the last bin was modified to be dives >200m. Time-at-depth records the relative amount of time that dives occurred across depth bins during a six-hour period. Data types 0 and 2 were utilized to sort records for this analysis.

Data type	Defined as
0	number of dives in bin X
1	number of dives in time bin Y – not used
2	time in bin X (TAD-time at depth)

Location and dive data are not initially linked in the output files from the Wildlife Computers programs that process data files received from Service-Argos, and thus the data files require sorting and error-checking to be combined. The goal of this data process was to achieve a database of location-linked diving activity that was a comparable subset of the location data utilized in the 2001 BiOp telemetry data analysis. Because of differences in programming however, combining data types is most readily achieved in output from the most recent versions of SDRs (models ST10 and ST16). Hence, this analysis was limited to data received from those SDRs deployed during 2000-2002 (Table 1). Subsequent analysis will include data from previous years in which earlier model SDRs were deployed. Note that because of this limitation, the data used in this analysis represent diving locations of juvenile (9 - 24 months old) Steller sea lions only. It does not include adult females.

A multi-step process prepared dive histogram data for linking with location data. From the raw data, records were selected by individual animal identifier and deployment date range. Valid data ranges were established as being records received from the date of instrument deployment and a modal end date for the deployment group set to exclude spurious transmissions. From this set, duplicate records (identical in animal identifier, date, and all dive histogram data) and those with incomplete or corrupted messages were removed. A sea lion dive was considered to be deeper than 4 m, and records were selected if either: a) the number of dives recorded in the 4 m bin (bin 1 of data type 0) were less than the sum of dives recorded in all bins; or, b) if the sum of time-at-depth (data type 2) in the time spent dry bin (data type 2, bin 1) plus time in the 0-4 m bin (data type 2, bin 2) were less than the time-at-depth sum of all bins. If duplicate records occurred in which bin data did not match (i.e., two records in the same bin) they were deleted. This removed 177 of 35,269 (0.5%) records. The remaining records were aggregated for each animal day for all periods in a manner that allowed inspection of which dive type contributed to the data. This aggregation resulted in 14,367 records. If dive data from data type 0 and data type 2 histogram bins did not match for a record (for example, dives >4 m were indicated by data type 0 data, but not data type 2 data), then the record was deleted. This removed 231 (1.6%) records.

Location records were selected by individual animal identifier (PTT number) and date as for dive histogram data. From an initial database of 31,412 locations, 396 "Z" location quality records were deleted, which are designated as bad locations by Service-Argos. The records were aggregated by animal, date and time, and 145 duplicate records (identical in time, latitude and longitude) were deleted. Location times were converted into one of the six-hour time periods. Location data were joined with dive data by animal identifier, day, and period. All location data were kept regardless of whether they were linked with dive data, resulting in a total of 30,871 records. The variable DIVE4M was created for each location to explain the type of data match to facilitate subsequent filtering:

Value	Description
-2	No dive histogram data
-1	Dive histogram data, but only of data type 1 (duration) and thus can not determine whether dive occurred to >4 m
0	No diving >4 m
1	Diving >4 m according to data type 0
4	Diving >4 m according to data type 2
5	Diving >4 m according to both data type 0 and data 2

This file was then merged with data indicating whether a transmission was sent while the SDR was in a wet or dry transmission cycle to identify the subset of locations with diving that were transmitted from at-sea locations.

Table I-1 Satellite depth recorder (SDR) deployments summarized by location, date, and sea lion age and size ranges for data considered in linking location and dive histogram data.

Location	Year	Deployment Month	SDRs deployed	Estimated Age Range (months)	Mass Range (kg)
Kodiak area	2000	Mar	2	9-21	66-94
	2001	Feb/Mar	10	9	80-126
		Jul/Aug	3	14	90-131
		Nov	1	17	109
	2002	Feb/Mar	10	9	74-141
		Jul/Aug	10	12-24	77-162
Unimak Pass area	2000	Mar	2	9	80-100
	2001	Feb/Mar	10	9-21	87-152
		Nov	3	5-17	84-108
	2002	Mar	10	9	72-135
Seguam area	2000	Feb	4	9	76-109
Total			65		

Table I-2 Number and proportion of Summer (April-September) dive-associated locations of juvenile Steller sea lions within 0-10 nm, 10-20 nm, and >20 nm of listed haulouts or rookeries.

		0-10 nm		10-20 nm		>20 within CH		Outside CH		Group Total
	Animal Id	Number of Locations	% 0-10 nm	Number of Locations	% 10-20 nm	Number of Locations	% >20 nm within CH	Number of Locations	% outside CH	Number of Locations
Sequam Area	6295	31	100.0%							31
	6296	13	100.0%							13
	6297	15	100.0%							15
	6298	69	51.5%	6	4.5%	9	6.7%	50	37.3%	134
	Group Total	128	66.3%	6	3.1%	9	4.7%	50	25.9%	193
Kodiak Area	6115	52	39.7%	12	9.2%	67	51.1%			131
	6214	131	97.8%	3	2.2%					134
	6286	195	92.9%	15	7.1%					210
	6287	114	99.1%			1	.9%			115
	6288	233	81.5%	33	11.5%			20	7.0%	286
	6289	207	98.6%	3	1.4%					210
	6290	66	95.7%	3	4.3%					69
	6291	109	97.3%	3	2.7%					112
	6292	128	96.2%	5	3.8%					133
	6293	264	93.0%	16	5.6%	1	.4%	3	1.1%	284
	6294	317	91.1%	23	6.6%	1	.3%	7	2.0%	348
	6301	139	99.3%	1	.7%					140
	6302	59	76.6%	13	16.9%			5	6.5%	77
	6966	45	93.8%	2	4.2%	1	2.1%			48
	6967	76	88.4%	9	10.5%	1	1.2%			86
	7467	152	78.4%	19	9.8%			23	11.9%	194
	7468	369	82.0%	61	13.6%	20	4.4%			450
	7469	43	97.7%	1	2.3%					44
	7471	45	100.0%							45
	7473	35	100.0%							35
	7474	119	98.3%	1	.8%	1	.8%			121
	7476	45	100.0%							45
	7479	75	100.0%							75
	7823	93	98.9%	1	1.1%					94
	7824	285	97.6%	7	2.4%					292
	7825	47	97.9%	1	2.1%					48
	7827	41	82.0%	8	16.0%			1	2.0%	50
	7829	93	98.9%	1	1.1%					94
	7830	139	93.3%	2	1.3%			8	5.4%	149
	7831	40	100.0%							40
	7832	45	100.0%							45
	Group Total	3801	90.4%	243	5.8%	93	2.2%	67	1.6%	4204
Unimak Pass Area	6299	4	100.0%							4
	6300	104	91.2%	10	8.8%					114
	6303	10	100.0%							10
	6304	35	100.0%							35
	6305	71	84.5%	6	7.1%			7	8.3%	84
	6306	7	100.0%							7
	6307	50	84.7%	4	6.8%	5	8.5%			59
	6308	147	87.5%	4	2.4%	11	6.5%	6	3.6%	168
	6309	42	100.0%							42
	6310	196	99.5%	1	.5%					197
	6311	23	95.8%	1	4.2%					24
	6312	1	100.0%							1
	6475	237	93.7%	16	6.3%					253
	7481	64	98.5%	1	1.5%					65
	7482	126	100.0%							126
	7483	112	40.4%	74	26.7%	35	12.6%	56	20.2%	277
	7484	112	97.4%	2	1.7%			1	.9%	115
	7485	65	98.5%			1	1.5%			66
	7486	131	99.2%	1	.8%					132
	7487	58	98.3%	1	1.7%					59
	7488	134	95.7%	4	2.9%			2	1.4%	140
	7489	92	96.8%	2	2.1%			1	1.1%	95
	Group Total	1821	87.8%	127	6.1%	52	2.5%	73	3.5%	2073
Table		5750	88.9%	376	5.8%	154	2.4%	190	2.9%	6470

Table I-3 Number and proportion of Winter (October-March) dive-associated locations of juvenile Steller sea lions within 0-10 nm, 10-20 nm, and >20 nm of listed haulouts or rookeries.

		0-10 nm		10-20 nm		>20 within CH		Outside CH		Group Total
	Animal Id	Number of Locations	% 0-10 nm	Number of Locations	% 10-20 nm	Number of Locations	% >20 nm within CH	Number of Locations	% outside CH	Number of Locations
Sequam Area	6295	40	100.0%							40
	6296	29	100.0%							29
	6297	33	100.0%							33
	6298	14	100.0%							14
	Group Total	116	100.0%							116
Kodiak Area	6115	83	88.3%	3	3.2%	8	8.5%			94
	6286	74	98.7%	1	1.3%					75
	6287	111	97.4%	2	1.8%	1	.9%			114
	6288	99	100.0%							99
	6289	46	100.0%							46
	6290	34	100.0%							34
	6291	64	94.1%	4	5.9%					68
	6292	69	100.0%							69
	6293	52	83.9%	5	8.1%	5	8.1%			62
	6294	75	92.6%	6	7.4%					81
	6301	8	16.7%	5	10.4%	35	72.9%			48
	6302	52	100.0%							52
	6647	54	100.0%							54
	7467	112	99.1%	1	.9%					113
	7468	144	98.0%	2	1.4%	1	.7%			147
	7469	77	100.0%							77
	7471	87	95.6%	4	4.4%					91
	7473	68	100.0%							68
	7474	96	98.0%	2	2.0%					98
	7476	25	89.3%	3	10.7%					28
	7478	25	100.0%							25
	7479	27	93.1%	1	3.4%			1	3.4%	29
	7830	39	90.7%	4	9.3%					43
	8237	161	62.6%	85	33.1%	10	3.9%	1	.4%	257
	Group Total	1682	89.9%	128	6.8%	60	3.2%	2	.1%	1872
Unimak Pass Area	6299	34	100.0%							34
	6300	48	100.0%							48
	6303	27	96.4%	1	3.6%					28
	6304	75	100.0%							75
	6305	85	85.0%	8	8.0%			7	7.0%	100
	6306	46	97.9%	1	2.1%					47
	6307	92	100.0%							92
	6308	73	100.0%							73
	6309	57	100.0%							57
	6310	64	98.5%	1	1.5%					65
	6311	20	100.0%							20
	6312	2	100.0%							2
	6466	22	100.0%							22
	6475	41	97.6%	1	2.4%					42
	7481	68	98.6%	1	1.4%					69
	7482	36	59.0%	23	37.7%			2	3.3%	61
	7483	96	67.6%	35	24.6%			11	7.7%	142
	7484	60	96.8%	1	1.6%	1	1.6%			62
	7485	70	98.6%	1	1.4%					71
	7486	34	89.5%	4	10.5%					38
	7487	25	100.0%							25
	7488	72	87.8%	8	9.8%			2	2.4%	82
	7489	54	100.0%							54
	8238	121	97.6%	2	1.6%			1	.8%	124
	8239	72	62.6%	32	27.8%			11	9.6%	115
	Group Total	1394	90.1%	119	7.7%	1	.1%	34	2.2%	1548
Table		3192	90.3%	247	7.0%	61	1.7%	36	1.0%	3536

Table I-4 Number and proportion of Summer (April-September) dive-associated locations of juvenile Steller sea lions within 0-10 nm, 10-20 nm, and >20 nm of shore.

		0-10 nm		10-20nm		>20 nm		Total # of locations
	Animal Id	Number of locations	% 0-10 nm	Number of locations	% 10-20 nm	Number of locations	% >20 nm	Total
Seguam Area	6295	31	100.0%					31
	6296	13	100.0%					13
	6297	15	100.0%					15
	6298	74	55.2%	1	.7%	59	44.0%	134
	Group Total	133	68.9%	1	.5%	59	30.6%	193
Kodiak Area	6115	131	100.0%					131
	6214	132	98.5%	2	1.5%			134
	6286	205	97.6%	5	2.4%			210
	6287	115	100.0%					115
	6288	278	97.2%	7	2.4%	1	.3%	286
	6289	210	100.0%					210
	6290	68	98.6%	1	1.4%			69
	6291	111	99.1%	1	.9%			112
	6292	129	97.0%	4	3.0%			133
	6293	280	98.6%	1	.4%	3	1.1%	284
	6294	330	94.8%	11	3.2%	7	2.0%	348
	6301	139	99.3%	1	.7%			140
	6302	63	81.8%	10	13.0%	4	5.2%	77
	6966	48	100.0%					48
	6967	86	100.0%					86
	7467	167	86.1%	18	9.3%	9	4.6%	194
	7468	446	99.1%	4	.9%			450
	7469	44	100.0%					44
	7471	45	100.0%					45
	7473	35	100.0%					35
	7474	121	100.0%					121
	7476	45	100.0%					45
	7479	75	100.0%					75
	7823	94	100.0%					94
	7824	288	98.6%	4	1.4%			292
	7825	48	100.0%					48
	7827	49	98.0%			1	2.0%	50
	7829	94	100.0%					94
	7830	139	93.3%	2	1.3%	8	5.4%	149
	7831	40	100.0%					40
	7832	45	100.0%					45
	Group Total	4100	97.5%	71	1.7%	33	.8%	4204
Unimak Pass Area	6299	4	100.0%					4
	6300	114	100.0%					114
	6303	10	100.0%					10
	6304	35	100.0%					35
	6305	84	100.0%					84
	6306	7	100.0%					7
	6307	59	100.0%					59
	6308	151	89.9%	1	.6%	16	9.5%	168
	6309	42	100.0%					42
	6310	197	100.0%					197
	6311	24	100.0%					24
	6312	1	100.0%					1
	6475	247	97.6%	6	2.4%			253
	7481	64	98.5%	1	1.5%			65
	7482	126	100.0%					126
	7483	258	93.1%	5	1.8%	14	5.1%	277
	7484	114	99.1%			1	.9%	115
	7485	65	98.5%			1	1.5%	66
	7486	132	100.0%					132
	7487	59	100.0%					59
	7488	134	95.7%	4	2.9%	2	1.4%	140
	7489	92	96.8%	2	2.1%	1	1.1%	95
	Group Total	2019	97.4%	19	.9%	35	1.7%	2073
Table Total		6252	96.6%	91	1.4%	127	2.0%	6470

Table I-5 Number and proportion of Winter (October-March) dive-associated locations of juvenile Steller sea lions within 0-10 nm, 10-20 nm, and >20 nm of shore.

		0-10 nm		10-20 nm		>20 nm		Total # of locations
	Animal Id	Number of locations	% 0-10 nm	Number of locations	%10-20 nm	Number of locations	% > 20 nm	Total
Seguam Area	6295	40	100.0%					40
	6296	29	100.0%					29
	6297	33	100.0%					33
	6298	14	100.0%					14
	Group Total	116	100.0%					116
Kodiak Area	6115	94	100.0%					94
	6286	74	98.7%	1	1.3%			75
	6287	112	98.2%	2	1.8%			114
	6288	99	100.0%					99
	6289	46	100.0%					46
	6290	34	100.0%					34
	6291	68	100.0%					68
	6292	69	100.0%					69
	6293	62	100.0%					62
	6294	81	100.0%					81
	6301	48	100.0%					48
	6302	52	100.0%					52
	6647	54	100.0%					54
	7467	112	99.1%	1	.9%			113
	7468	147	100.0%					147
	7469	77	100.0%					77
	7471	89	97.8%	2	2.2%			91
	7473	68	100.0%					68
	7474	98	100.0%					98
	7476	28	100.0%					28
	7478	25	100.0%					25
	7479	28	96.6%	1	3.4%			29
	7830	42	97.7%	1	2.3%			43
	8237	239	93.0%	18	7.0%			257
	Group Total	1846	98.6%	26	1.4%			1872
Unimak Pass Area	6299	34	100.0%					34
	6300	48	100.0%					48
	6303	28	100.0%					28
	6304	75	100.0%					75
	6305	100	100.0%					100
	6306	46	97.9%	1	2.1%			47
	6307	92	100.0%					92
	6308	73	100.0%					73
	6309	57	100.0%					57
	6310	65	100.0%					65
	6311	20	100.0%					20
	6312	2	100.0%					2
	6466	22	100.0%					22
	6475	41	97.6%	1	2.4%			42
	7481	69	100.0%					69
	7482	60	98.4%	1	1.6%			61
	7483	126	88.7%	13	9.2%	3	2.1%	142
	7484	61	98.4%			1	1.6%	62
	7485	70	98.6%	1	1.4%			71
	7486	36	94.7%	2	5.3%			38
	7487	25	100.0%					25
	7488	78	95.1%	4	4.9%			82
	7489	54	100.0%					54
	8238	122	98.4%	1	.8%	1	.8%	124
	8239	112	97.4%	2	1.7%	1	.9%	115
	Group Total	1516	97.9%	26	1.7%	6	.4%	1548
Table		3478	98.4%	52	1.5%	6	.2%	3536

Table I-6 Number and proportion of Summer (April-September) dive-associated locations of juvenile Steller sea lions less than 11 months of age.

<11 months of age Summer: April - September		0-10 nm		10-20 nm		>20 within CH		Outside CH		Group Total
		Number of Locations	% 0-10 nm	Number of Locations	% 10-20 nm	Number of Locations	% >20 nm within CH	Number of Locations	% outside CH	Number of Locations
Seguam Area	6295	31	100.00%							31
	6296	13	100.00%							13
	6297	15	100.00%							15
	6298	46	97.90%					1	2.10%	47
	Group Total	105	99.10%					1	0.90%	106
Kodiak Area	6115	49	63.60%	5	6.50%	23	29.90%			77
	6286	112	94.10%	7	5.90%					119
	6287	103	99.00%			1	1.00%			104
	6288	88	71.50%	16	13.00%			19	15.40%	123
	6289	88	100.00%							88
	6290	66	95.70%	3	4.30%					69
	6291	97	97.00%	3	3.00%					100
	6292	127	96.20%	5	3.80%					132
	6293	71	89.90%	6	7.60%	1	1.30%	1	1.30%	79
	6294	114	97.40%	2	1.70%			1	0.90%	117
	6302	31	91.20%	3	8.80%					34
	7467	91	98.90%					1	1.10%	92
	7468	233	97.10%	6	2.50%	1	0.40%			240
	7469	37	100.00%							37
	7471	45	100.00%							45
	7473	35	100.00%							35
	7474	101	99.00%	1	1.00%					102
	7479	4	100.00%							4
	Group Total	1492	93.40%	57	3.60%	26	1.60%	22	1.40%	1597
Unimak Pass Area	6299	4	100.00%							4
	6300	40	88.90%	5	11.10%					45
	6304	35	100.00%							35
	6305	35	100.00%							35
	6307	50	84.70%	4	6.80%	5	8.50%			59
	6308	60	100.00%							60
	6309	28	100.00%							28
	6310	86	100.00%							86
	6312	1	100.00%							1
	6475	66	98.50%	1	1.50%					67
	7481	64	98.50%	1	1.50%					65
	7482	109	100.00%							109
	7483	43	24.40%	63	35.80%	15	8.50%	55	31.30%	176
	7484	74	96.10%	2	2.60%			1	1.30%	77
	7485	59	100.00%							59
	7486	117	100.00%							117
	7487	23	100.00%							23
	7488	84	96.60%	2	2.30%			1	1.10%	87
	7489	82	97.60%	1	1.20%			1	1.20%	84
	Group Total	1060	87.10%	79	6.50%	20	1.60%	58	4.80%	1217
Table Total		2657	91.00%	136	4.70%	46	1.60%	81	2.80%	2920

Table I-7 Number and proportion of Winter (October-March) dive-associated locations of juvenile Steller sea lions less than 11 months of age.

<11 months age Winter: October - March		0-10 nm		10-20 nm		>20 within CH		Outside CH		Group Total
		Number of Locations	% 0-10 nm	Number of Locations	% 10-20 nm	Number of Locations	% >20 nm within CH	Number of Locations	% outside CH	Number of Locations
Seguam Area	6295	40	100.00%							40
	6296	29	100.00%							29
	6297	33	100.00%							33
	6298	14	100.00%							14
	Group Total	116	100.00%							116
Kodiak Island Area	6115	83	88.30%	3	3.20%	8	8.50%			94
	6286	74	98.70%	1	1.30%					75
	6287	111	97.40%	2	0.018	1	0.90%			114
	6288	99	100.00%							99
	6289	46	100.00%							46
	6290	34	100.00%							34
	6291	64	94.10%	4	5.90%					68
	6292	69	100.00%							69
	6293	52	83.90%	5	8.10%	5	8.10%			62
	6294	75	92.60%	6	7.40%					81
	6302	52	100.00%							52
	6647	54	100.00%							54
	7467	112	99.10%	1	0.90%					113
	7468	144	98.00%	2	0.014	1	0.007			147
	7469	77	100.00%							77
	7471	87	95.60%	4	0.044					91
	7473	68	100.00%							68
	7474	96	98.00%	2	0.02					98
	7478	25	100.00%							25
	7479	27	93.10%	1	0.034			1	0.034	29
	Group Total	1449	96.90%	31	2.10%	15	0.01	1	0.001	1496
Unimak Pass Area	6299	34	100.00%							34
	6300	48	100.00%							48
	6304	75	100.00%							75
	6305	85	85.00%	8	0.08			7	0.07	100
	6307	92	100.00%							92
	6308	73	100.00%							73
	6309	57	100.00%							57
	6310	64	98.50%	1	1.50%					65
	6312	2	100.00%							2
	6466	22	100.00%							22
	6475	41	97.60%	1	2.40%					42
	7481	68	98.60%	1	1.40%					69
	7482	36	59.00%	23	0.377			2	0.033	61
	7483	96	67.60%	35	0.246			11	0.077	142
	7484	60	96.80%	1	0.016	1	0.016			62
	7485	70	98.60%	1	1.40%					71
	7486	34	89.50%	4	10.50%					38
	7487	25	100.00%							25
	7488	72	87.80%	8	9.80%			2	2.40%	82
	7489	54	100.00%							54
	8238	121	97.60%	2	1.60%			1	0.80%	124
	Group Total	1229	91.90%	85	6.40%	1	0.10%	23	1.70%	1338
Table Total		2794	94.70%	116	3.90%	16	0.50%	24	0.80%	2950

Table I-8 Number and proportion of Summer (April-September) dive-associated locations of juvenile Steller sea lions greater than 10 months of age.

>10 months Summer: April - October		0-10 nm		10-20 nm		>20 within CH		Outside CH		Group Total
		Number of Locations	% 0-10 nm	Number of Locations	% 10-20 nm	Number of Locations	% >20 nm within CH	Number of Locations	% outside CH	Number of Locations
Seguam Area	6298	23	26.40%	6	6.90%	9	10.30%	49	56.30%	87
	Group Total	23	26.40%	6	6.90%	9	10.30%	49	56.30%	87
Kodiak Area	6115	3	5.60%	7	13.00%	44	81.50%			54
	6214	131	97.80%	3	2.20%					134
	6286	83	91.20%	8	8.80%					91
	6287	11	100.00%							11
	6288	145	89.00%	17	10.40%			1	0.60%	163
	6289	119	97.50%	3	2.50%					122
	6291	12	100.00%							12
	6292	1	100.00%							1
	6293	193	94.10%	10	4.90%			2	1.00%	205
	6294	203	87.90%	21	9.10%	1	0.40%	6	2.60%	231
	6301	139	99.30%	1	0.70%					140
	6302	28	65.10%	10	23.30%			5	11.60%	43
	6966	45	93.80%	2	4.20%	1	2.10%			48
	6967	76	88.40%	9	10.50%	1	1.20%			86
	7467	61	59.80%	19	18.60%			22	21.60%	102
	7468	136	64.80%	55	26.20%	19	9.00%			210
	7469	6	85.70%	1	14.30%					7
	7474	18	94.70%			1	5.30%			19
	7476	45	100.00%							45
	7479	71	100.00%							71
	7823	93	98.90%	1	1.10%					94
	7824	285	97.60%	7	2.40%					292
	7825	47	97.90%	1	2.10%					48
	7827	41	82.00%	8	16.00%			1	2.00%	50
	7829	93	98.90%	1	1.10%					94
	7830	139	93.30%	2	1.30%			8	5.40%	149
	7831	40	100.00%							40
	7832	45	100.00%							45
	Group Total	2309	88.60%	186	7.10%	67	2.60%	45	1.70%	2607
Unimak Pass Area	6300	64	92.80%	5	7.20%					69
	6303	10	100.00%							10
	6305	36	73.50%	6	12.20%			7	14.30%	49
	6306	7	100.00%							7
	6308	87	80.60%	4	3.70%	11	10.20%	6	5.60%	108
	6309	14	100.00%							14
	6310	110	99.10%	1	0.90%					111
	6311	23	95.80%	1	4.20%					24
	6475	171	91.90%	15	8.10%					186
	7482	17	100.00%							17
	7483	69	68.30%	11	10.90%	20	19.80%	1	1.00%	101
	7484	38	100.00%							38
	7485	6	85.70%			1	14.30%			7
	7486	14	93.30%	1	6.70%					15
	7487	35	97.20%	1	2.80%					36
	7488	50	94.30%	2	3.80%			1	1.90%	53
	7489	10	90.90%	1	9.10%					11
	Group Total	761	88.90%	48	5.60%	32	3.70%	15	1.80%	856
Table Total		3093	87.10%	240	6.80%	108	3.00%	109	3.10%	3550

Table I-9 Number and proportion of Winter (October-March) dive-associated locations of juvenile Steller sea lions greater than 10 months of age.

>10 months Winter: October-March		0-10 nm		10-20 nm		>20 within CH		Outside CH		Group Total
		Number of Locations	% 0-10 nm	Number of Locations	% 10-20 nm	Number of Locations	% >20 nm within CH	Number of Locations	% outside CH	Number of Locations
Kodiak Area	6301	8	16.70%	5	10.40%	35	72.90%			48
	7476	25	89.30%	3	10.70%					28
	7830	39	90.70%	4	9.30%					43
	8237	161	62.60%	85	33.10%	10	3.90%	1	0.40%	257
	Group Total	233	62.00%	97	25.80%	45	12.00%	1	0.30%	376
Unimak Pass Area	6303	27	96.40%	1	3.60%					28
	6306	46	97.90%	1	2.10%					47
	6311	20	100.00%							20
	8239	72	62.60%	32	27.80%			11	9.60%	115
	Group Total	165	78.60%	34	16.20%			11	5.20%	210
Table Total		398	67.90%	131	22.40%	45	7.70%	12	2.00%	586

Appendix II Expanded catch database.Table II-1

				BSAI Catch Amounts in mt expanded from the Blend estimates									BSAI Catch Amounts in PERCENT expanded from the Blend estimates							
Year	Fishery	Gear	Quarter	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1991	Pollock	Trawl	1	272	37,506	258,788	296,566	492,185	161,884	222,575	526,999	553,705	0.0	6.8	46.7	53.6	88.9	29.2	40.2	95.2
1991	Pollock	Trawl	2	127	10,298	27,255	37,679	64,305	4,620	15,452	78,305	216,558	0.1	4.8	12.6	17.4	29.7	2.1	7.1	36.2
1991	Pollock	Trawl	3	55	3,421	55,805	59,281	108,309	37,688	22,644	114,473	554,276	0.0	0.6	10.1	10.7	19.5	6.8	4.1	20.7
1991	Pollock	Trawl	4	0	3	5	8	11	5	5	11	1,888	0.0	0.2	0.3	0.4	0.6	0.2	0.3	0.6
1991	Pollock	Trawl	ALL	454	51,228	341,853	393,534	664,809	204,197	260,675	719,788	1,326,427	0.0	3.9	25.8	29.7	50.1	15.4	19.7	54.3
1991	Pollock	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Pollock	Pot	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Pollock	Pot	3	0	0	0	1	1	0	0	1	1	1.5	24.4	28.9	54.8	56.0	39.2	37.4	65.1
1991	Pollock	Pot	4	0	0	0	0	1	0	0	1	1	0.0	10.1	42.0	52.1	77.6	27.4	27.4	77.6
1991	Pollock	Pot	ALL	0	0	1	1	1	1	1	1	2	0.8	17.4	35.3	53.5	66.6	33.4	32.5	71.2
1991	Pollock	Longline	1	0	1	15	16	3	0	16	19	230	0.1	0.4	6.3	6.9	1.5	0.1	6.7	8.2
1991	Pollock	Longline	2	0	1	4	4	0	0	4	4	516	0.0	0.1	0.7	0.9	0.0	0.0	0.7	0.7
1991	Pollock	Longline	3	0	4	6	10	43	4	8	47	757	0.0	0.5	0.7	1.3	5.7	0.6	1.0	6.1
1991	Pollock	Longline	4	0	4	20	24	70	5	9	82	906	0.0	0.4	2.2	2.6	7.7	0.6	1.0	9.1
1991	Pollock	Longline	ALL	0	9	44	54	117	10	35	152	2,409	0.0	0.4	1.8	2.2	4.8	0.4	1.5	6.3
1991	Pollock	ALL	ALL	454	51,238	341,897	393,589	664,927	204,208	260,711	719,941	1,328,838	0.0	3.9	25.7	29.6	50.0	15.4	19.6	54.2
1991	P. Cod	Trawl	1	59	5,197	15,747	21,003	31,890	7,126	7,964	34,003	43,528	0.1	11.9	36.2	48.3	73.3	16.4	18.3	78.1
1991	P. Cod	Trawl	2	55	3,976	5,264	9,295	15,027	3,415	4,892	16,591	40,212	0.1	9.9	13.1	23.1	37.4	8.5	12.2	41.3
1991	P. Cod	Trawl	3	37	124	710	870	1,461	528	484	1,803	19,559	0.2	0.6	3.6	4.5	7.5	2.7	2.5	9.2
1991	P. Cod	Trawl	4	0	0	10	10	10	10	0	10	1,022	0.0	0.0	0.9	1.0	1.0	0.9	0.0	1.0
1991	P. Cod	Trawl	ALL	151	9,298	21,730	31,179	48,388	11,079	13,340	52,407	104,320	0.1	8.9	20.8	29.9	46.4	10.6	12.8	50.2
1991	P. Cod	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	P. Cod	Pot	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	P. Cod	Pot	3	33	651	577	1,261	1,420	1,036	903	1,432	3,182	1.0	20.5	18.1	39.6	44.6	32.6	28.4	45.0
1991	P. Cod	Pot	4	0	359	492	851	973	658	631	973	1,933	0.0	18.6	25.4	44.0	50.3	34.0	32.6	50.3
1991	P. Cod	Pot	ALL	33	1,010	1,069	2,112	2,392	1,694	1,534	2,405	5,115	0.6	19.8	20.9	41.3	46.8	33.1	30.0	47.0
1991	P. Cod	Longline	1	26	230	1,220	1,476	398	226	1,379	1,779	12,304	0.2	1.9	9.9	12.0	3.2	1.8	11.2	14.5
1991	P. Cod	Longline	2	0	144	361	504	106	62	494	537	17,338	0.0	0.8	2.1	2.9	0.6	0.4	2.9	3.1
1991	P. Cod	Longline	3	26	229	280	535	537	230	472	788	18,113	0.1	1.3	1.5	3.0	3.0	1.3	2.6	4.4
1991	P. Cod	Longline	4	40	384	1,041	1,466	2,982	393	922	4,006	15,103	0.3	2.5	6.9	9.7	19.7	2.6	6.1	26.5
1991	P. Cod	Longline	ALL	93	987	2,903	3,982	4,022	911	3,267	7,110	62,858	0.1	1.6	4.6	6.3	6.4	1.4	5.2	11.3
1991	P. Cod	ALL	ALL	276	11,295	25,702	37,273	54,803	13,684	18,140	61,922	172,293	0.2	6.6	14.9	21.6	31.8	7.9	10.5	35.9
1991	Atka mackerel	Trawl	1	229	19,575	2,064	21,867	15,238	21,551	21,678	21,881	23,497	1.0	83.3	8.8	93.1	64.9	91.7	92.3	93.1
1991	Atka mackerel	Trawl	2	36	290	88	413	291	404	400	426	669	5.4	43.3	13.1	61.8	43.5	60.4	59.8	63.7
1991	Atka mackerel	Trawl	3	0	0	1	2	1	1	1	2	2	3.7	0.8	69.2	73.7	69.1	52.4	40.3	77.8
1991	Atka mackerel	Trawl	4	0	0	2	2	2	2	0	2	4	0.0	0.0	51.0	51.0	51.0	51.0	0.0	51.0
1991	Atka mackerel	Trawl	ALL	265	19,864	2,155	22,283	15,531	21,958	22,078	22,310	24,171	1.1	82.2	8.9	92.2	64.3	90.8	91.3	92.3
1991	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	0.0	34.2	52.6	86.8	99.2	71.9	67.8	99.2
1991	Atka mackerel	Pot	4	0	0	1	1	1	1	1	1	1	0.0	33.2	65.9	99.1	99.1	96.1	92.4	99.1
1991	Atka mackerel	Pot	ALL	0	0	1	1	1	1	1	1	1	0.0	33.4	63.1	96.6	99.1	91.0	87.2	99.1
1991	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Longline	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Longline	3	0	0	2	2	0	0	2	2	2	0.0	0.6	75.5	76.2	3.4	2.4	75.2	76.2
1991	Atka mackerel	Longline	4	0	0	0	0	0	0	0	0	1	0.0	29.6	4.6	34.2	31.8	31.8	31.2	34.2
1991	Atka mackerel	Longline	ALL	0	0	2	2	0	0	2	2	3	0.0	7.4	51.1	58.5	9.8	9.1	57.1	58.5
1991	Atka mackerel	ALL	ALL	265	19,865	2,157	22,286	15,533	21,959	22,081	22,313	24,175	1.1	82.2	8.9	92.2	64.3	90.8	91.3	92.3
1992	Pollock	Trawl	1	159	19	84	261	232,590	1	99	288,710	562,521	0.0	0.0	0.0	0.0	41.3	0.0	0.0	51.3
1992	Pollock	Trawl	2	3	4	12	19	15,029	5	10	29,793	249,309	0.0	0.0	0.0	0.0	6.0	0.0	0.0	12.0
1992	Pollock	Trawl	3	0	17	31	47	202,647	34	44	207,848	504,648	0.0	0.0	0.0	0.0	40.2	0.0	0.0	41.2
1992	Pollock	Trawl	4	0	0	0	0	102,991	0	0	111,647	123,136	0.0	0.0	0.0	0.0	83.6	0.0	0.0	90.7
1992	Pollock	Trawl	ALL	161	39	127	327	553,256	40	153	637,998	1,439,615	0.0	0.0	0.0	0.0	38.4	0.0	0.0	44.3

				BSAI Catch Amounts in mt expanded from the Blend estimates									BSAI Catch Amounts in PERCENT expanded from the Blend estimates							
Year	Fishery	Gear	Quarter	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1992	Pollock	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Pollock	Pot	2	0	0	2	2	2	0	1	2	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Pollock	Pot	3	0	1	1	3	4	0	0	4	4	0.0	33.5	28.1	61.6	89.0	6.4	11.7	96.1
1992	Pollock	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Pollock	Pot	ALL	0	2	3	5	6	0	1	6	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Pollock	Longline	1	0	19	84	103	6	1	99	105	1,121	0.0	1.7	7.5	9.1	0.5	0.1	8.9	9.3
1992	Pollock	Longline	2	0	4	12	16	51	5	10	58	1,268	0.0	0.3	1.0	1.3	4.0	0.4	0.8	4.6
1992	Pollock	Longline	3	0	17	31	47	197	34	44	215	911	0.0	1.9	3.4	5.2	21.7	3.7	4.8	23.6
1992	Pollock	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Pollock	Longline	ALL	0	39	127	166	254	40	153	378	3,301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Pollock	ALL	ALL	161	80	257	498	553,516	80	308	638,383	1,442,923	0.0	0.0	0.0	0.0	38.4	0.0	0.0	44.2
1992	P. Cod	Trawl	1	135	3,138	9,676	12,949	18,341	522	5,590	23,497	45,804	0.3	6.9	21.1	28.3	40.0	1.1	12.2	51.3
1992	P. Cod	Trawl	2	18	3,167	7,850	11,035	7,638	1,960	5,794	11,988	29,950	0.1	10.6	26.2	36.8	25.5	6.5	19.3	40.0
1992	P. Cod	Trawl	3	0	15	541	556	534	493	256	830	12,574	0.0	0.1	4.3	4.4	4.2	3.9	2.0	6.6
1992	P. Cod	Trawl	4	0	12	381	393	601	49	235	818	3,490	0.0	0.3	10.9	11.3	17.2	1.4	6.7	23.4
1992	P. Cod	Trawl	ALL	152	6,333	18,448	24,934	27,114	3,024	11,874	37,133	91,818	0.2	6.9	20.1	27.2	29.5	3.3	12.9	40.4
1992	P. Cod	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	P. Cod	Pot	2	120	1,944	1,656	3,720	3,766	2,088	2,273	4,105	7,073	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	P. Cod	Pot	3	203	1,133	877	2,213	2,075	1,371	1,783	3,510	6,218	3.3	18.2	14.1	35.6	33.4	22.0	28.7	56.4
1992	P. Cod	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	P. Cod	Pot	ALL	323	3,077	2,533	5,932	5,840	3,458	4,055	7,614	13,291	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	P. Cod	Longline	1	0	1,153	3,885	5,038	1,705	1,038	4,577	5,266	32,059	0.0	3.6	12.1	15.7	5.3	3.2	14.3	16.4
1992	P. Cod	Longline	2	130	990	1,480	2,600	2,444	1,005	2,168	4,255	38,830	0.3	2.5	3.8	6.7	6.3	2.6	5.6	11.0
1992	P. Cod	Longline	3	17	812	1,014	1,843	4,048	1,172	1,378	4,980	31,374	0.1	2.6	3.2	5.9	12.9	3.7	4.4	15.9
1992	P. Cod	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	P. Cod	Longline	ALL	147	2,955	6,379	9,481	8,197	3,215	8,123	14,501	102,263	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	P. Cod	ALL	ALL	622	12,364	27,361	40,347	41,151	9,698	24,052	59,249	207,372	0.3	6.0	13.2	19.5	19.8	4.7	11.6	28.6
1992	Atka mackerel	Trawl	1	0	4,442	3,795	8,237	805	4,870	7,685	8,323	28,617	0.0	15.5	13.3	28.8	2.8	17.0	26.9	29.1
1992	Atka mackerel	Trawl	2	378	326	4,323	5,027	1,148	1,879	4,590	5,058	18,936	2.0	1.7	22.8	26.5	6.1	9.9	24.2	26.7
1992	Atka mackerel	Trawl	3	0	0	93	93	94	80	45	98	515	0.0	0.0	18.1	18.1	18.2	15.5	8.7	19.0
1992	Atka mackerel	Trawl	4	0	0	353	353	364	353	140	364	386	0.0	0.0	91.4	91.4	94.3	91.4	36.3	94.3
1992	Atka mackerel	Trawl	ALL	378	4,768	8,564	13,710	2,411	7,182	12,460	13,843	48,454	0.8	9.8	17.7	28.3	5.0	14.8	25.7	28.6
1992	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	Pot	3	0	0	2	2	2	0	0	2	9	0.0	0.0	21.3	21.3	21.3	0.0	0.0	21.3
1992	Atka mackerel	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	Pot	ALL	0	0	2	2	2	0	0	2	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	Longline	2	0	0	0	0	0	0	0	0	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	Longline	3	0	0	0	0	0	0	0	0	46	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	Longline	ALL	0	0	0	0	0	0	0	0	58	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	ALL	ALL	378	4,768	8,566	13,712	2,413	7,182	12,460	13,845	48,523	0.8	9.8	17.7	28.3	5.0	14.8	25.7	28.5
1993	Pollock	Trawl	1	277	17,956	66,209	84,442	259,872	6,712	52,220	318,084	585,906	0.0	3.1	11.3	14.4	44.4	1.1	8.9	54.3
1993	Pollock	Trawl	2	86	1,178	2,432	3,696	9,192	1,043	2,028	11,179	26,471	0.3	4.5	9.2	14.0	34.7	3.9	7.7	42.2
1993	Pollock	Trawl	3	31	3,095	68,797	71,924	314,250	44,700	24,257	328,114	680,959	0.0	0.5	10.1	10.6	46.1	6.6	3.6	48.2
1993	Pollock	Trawl	4	0	3,315	17,885	21,199	51,629	10,761	12,595	64,457	89,011	0.0	3.7	20.1	23.8	58.0	12.1	14.1	72.4
1993	Pollock	Trawl	ALL	393	25,544	155,323	181,261	634,943	63,215	91,101	721,835	1,382,347	0.0	1.8	11.2	13.1	45.9	4.6	6.6	52.2
1993	Pollock	Pot	1	0	0	0	0	0	0	0	0	0	0.0	20.1	39.4	59.6	100.0	0.0	0.0	100.0
1993	Pollock	Pot	2	0	1	0	2	2	0	0	2	2	0.0	86.1	7.6	93.7	99.3	20.4	16.2	99.6
1993	Pollock	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Pollock	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Pollock	Pot	ALL	0	1	0	2	2	0	0	2	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Year	Fishery	Gear	Quarter	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1993	Pollock	Longline	1	0	17	74	91	78	5	84	158	1,715	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Pollock	Longline	2	0	3	24	27	29	20	20	55	448	0.0	0.7	5.4	6.1	6.5	4.4	4.5	12.2
1993	Pollock	Longline	3	0	0	0	0	0	0	0	0	0	0.0	10.6	89.4	100.0	89.4	70.4	89.4	100.0
1993	Pollock	Longline	4	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	0.0	100.0	100.0
1993	Pollock	Longline	ALL	0	20	98	119	108	25	104	213	2,163	0.0	0.9	4.5	5.5	5.0	1.1	4.8	9.8
1993	Pollock	ALL	ALL	394	25,566	155,421	181,381	635,052	63,240	91,205	722,049	1,384,512	0.0	1.8	11.2	13.1	45.9	4.6	6.6	52.2
1993	P. Cod	Trawl	1	117	2,836	16,283	19,236	25,091	827	8,609	33,741	54,773	0.2	5.2	29.7	35.1	45.8	1.5	15.7	61.6
1993	P. Cod	Trawl	2	4	993	4,238	5,234	15,525	1,290	2,194	17,197	27,183	0.0	3.7	15.6	19.3	57.1	4.7	8.1	63.3
1993	P. Cod	Trawl	3	39	509	1,329	1,877	1,975	1,015	1,381	3,112	11,289	0.3	4.5	11.8	16.6	17.5	9.0	12.2	27.6
1993	P. Cod	Trawl	4	0	10	260	271	666	183	47	706	5,830	0.0	0.2	4.5	4.6	11.4	3.1	0.8	12.1
1993	P. Cod	Trawl	ALL	159	4,348	22,110	26,617	43,257	3,315	12,231	54,756	99,074	0.2	4.4	22.3	26.9	43.7	3.3	12.3	55.3
1993	P. Cod	Pot	1	0	15	17	33	42	25	23	42	42	0.0	36.7	41.7	78.4	100.0	59.6	54.7	100.0
1993	P. Cod	Pot	2	0	1,268	520	1,788	2,045	1,270	1,260	2,047	2,056	0.0	61.7	25.3	87.0	99.5	61.8	61.3	99.5
1993	P. Cod	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	P. Cod	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	P. Cod	Pot	ALL	0	1,284	537	1,821	2,087	1,295	1,283	2,088	2,098	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	P. Cod	Longline	1	42	2,889	5,120	8,050	5,798	3,390	7,353	10,504	44,586	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	P. Cod	Longline	2	24	934	1,218	2,177	2,058	1,705	1,846	3,819	21,560	0.1	4.3	5.7	10.1	9.5	7.9	8.6	17.7
1993	P. Cod	Longline	3	0	2	4	7	4	4	6	7	7	2.4	34.2	60.6	97.2	58.0	65.4	84.5	97.2
1993	P. Cod	Longline	4	0	0	0	0	0	0	0	0	0	0.0	44.5	30.2	74.7	0.0	38.9	68.0	74.7
1993	P. Cod	Longline	ALL	66	3,825	6,342	10,234	7,860	5,099	9,205	14,329	66,153	0.1	5.8	9.6	15.5	11.9	7.7	13.9	21.7
1993	P. Cod	ALL	ALL	225	9,457	28,990	38,672	53,204	9,708	22,720	71,173	167,325	0.1	5.7	17.3	23.1	31.8	5.8	13.6	42.5
1993	Atka mackerel	Trawl	1	1	286	20,066	20,353	41	619	20,152	20,404	33,810	0.0	0.8	59.3	60.2	0.1	1.8	59.6	60.3
1993	Atka mackerel	Trawl	2	0	276	4,146	4,422	338	928	3,779	4,422	5,090	0.0	5.4	81.5	86.9	6.6	18.2	74.2	86.9
1993	Atka mackerel	Trawl	3	191	270	1,367	1,828	29	1,379	1,459	1,828	17,525	1.1	1.5	7.8	10.4	0.2	7.9	8.3	10.4
1993	Atka mackerel	Trawl	4	0	3	1,585	1,588	10	23	13	1,588	8,672	0.0	0.0	18.3	18.3	0.1	0.3	0.1	18.3
1993	Atka mackerel	Trawl	ALL	192	835	27,164	28,191	418	2,949	25,403	28,242	65,097	0.3	1.3	41.7	43.3	0.6	4.5	39.0	43.4
1993	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	Pot	ALL	0	0	0	0	0	0	0	0	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	Longline	2	0	0	0	0	0	0	0	0	14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	Longline	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	Longline	ALL	0	0	0	0	0	0	0	0	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	ALL	ALL	192	835	27,164	28,191	418	2,949	25,403	28,242	65,121	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Pollock	Trawl	1	1,042	19,911	41,722	62,675	458,336	3,731	16,869	477,142	594,697	0.2	3.3	7.0	10.5	77.1	0.6	2.8	80.2
1994	Pollock	Trawl	2	4	1,456	14,733	16,193	24,470	10,246	3,763	24,852	30,762	0.0	4.7	47.9	52.6	79.5	33.3	12.2	80.8
1994	Pollock	Trawl	3	0	13,444	127,226	140,670	286,368	79,146	58,991	317,256	696,817	0.0	1.9	18.3	20.2	41.1	11.4	8.5	45.5
1994	Pollock	Trawl	4	601	1,259	12,766	14,626	20,220	12,281	5,185	22,618	62,545	1.0	2.0	20.4	23.4	32.3	19.6	8.3	36.2
1994	Pollock	Trawl	ALL	1,647	36,070	196,447	234,164	789,394	105,405	84,808	841,868	1,384,821	0.1	2.6	14.2	16.9	57.0	7.6	6.1	60.8
1994	Pollock	Pot	1	0	0	0	1	1	0	0	1	1	18.9	80.7	0.4	100.0	100.0	77.4	34.2	100.0
1994	Pollock	Pot	2	0	0	0	1	1	0	0	1	1	0.0	40.8	40.3	81.1	77.1	31.0	31.7	84.3
1994	Pollock	Pot	3	0	0	0	0	0	0	0	0	0	0.0	46.3	51.1	97.4	100.0	97.4	95.9	100.0
1994	Pollock	Pot	4	0	2	0	2	2	2	2	2	2	0.0	95.6	2.3	97.9	98.9	96.8	97.8	100.0
1994	Pollock	Pot	ALL	0	3	1	3	3	3	2	3	4	2.8	76.1	14.6	93.5	93.0	75.5	69.7	95.6
1994	Pollock	Longline	1	0	9	86	95	35	8	89	120	2,006	0.0	0.4	4.3	4.7	1.7	0.4	4.5	6.0
1994	Pollock	Longline	2	0	7	71	78	16	12	74	92	907	0.0	0.7	7.8	8.6	1.8	1.3	8.2	10.2
1994	Pollock	Longline	3	0	1	6	7	45	3	5	51	485	0.0	0.2	1.2	1.5	9.2	0.7	0.9	10.5
1994	Pollock	Longline	4	0	2	20	22	44	4	20	62	280	0.0	0.8	7.0	7.8	15.7	1.6	7.1	22.0
1994	Pollock	Longline	ALL	0	19	182	201	140	28	188	325	3,678	0.0	0.5	5.0	5.5	3.8	0.8	5.1	8.8

Year	Fishery	Gear	Quarter	BSAI Catch Amounts in mt expanded from the Blend estimates									BSAI Catch Amounts in PERCENT expanded from the Blend estimates							
				0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1994	Pollock	ALL	ALL	1,647	36,092	196,630	234,369	789,537	105,436	84,998	842,196	1,388,502	0.1	2.6	14.2	16.9	56.9	7.6	6.1	60.7
1994	P. Cod	Trawl	1	143	4,069	11,416	15,628	28,821	1,965	6,788	35,662	44,753	0.3	9.1	25.5	34.9	64.4	4.4	15.2	79.7
1994	P. Cod	Trawl	2	77	2,165	7,653	9,895	16,758	5,023	4,240	21,067	25,595	0.3	8.5	29.9	38.7	65.5	19.6	16.6	82.3
1994	P. Cod	Trawl	3	4	184	1,985	2,173	1,682	1,540	1,498	2,862	12,323	0.0	1.5	16.1	17.6	13.6	12.5	12.2	23.2
1994	P. Cod	Trawl	4	0	5	62	67	64	53	30	81	6,832	0.0	0.1	0.9	1.0	0.9	0.8	0.4	1.2
1994	P. Cod	Trawl	ALL	224	6,423	21,116	27,763	47,325	8,581	12,556	59,672	89,503	0.3	7.2	23.6	31.0	52.9	9.6	14.0	66.7
1994	P. Cod	Pot	1	38	603	123	764	764	697	542	766	766	5.0	78.7	16.1	99.7	99.7	91.0	70.8	100.0
1994	P. Cod	Pot	2	3	2,335	1,337	3,675	3,744	2,298	2,400	3,919	4,042	0.1	57.8	33.1	90.9	92.6	56.9	59.4	97.0
1994	P. Cod	Pot	3	0	303	404	707	722	670	705	722	722	0.0	42.0	56.0	97.9	100.0	92.8	97.6	100.0
1994	P. Cod	Pot	4	0	1,191	300	1,491	1,775	1,439	1,424	1,799	1,845	0.0	64.6	16.3	80.8	96.2	78.0	77.2	97.5
1994	P. Cod	Pot	ALL	41	4,432	2,164	6,637	7,005	5,104	5,071	7,206	7,375	0.6	60.1	29.3	90.0	95.0	69.2	68.8	97.7
1994	P. Cod	Longline	1	32	2,072	3,766	5,870	4,930	2,540	4,803	8,410	38,553	0.1	5.4	9.8	15.2	12.8	6.6	12.5	21.8
1994	P. Cod	Longline	2	58	2,265	2,649	4,972	1,967	3,469	3,601	6,068	24,608	0.2	9.2	10.8	20.2	8.0	14.1	14.6	24.7
1994	P. Cod	Longline	3	6	477	523	1,006	1,781	711	753	2,725	11,856	0.1	4.0	4.4	8.5	15.0	6.0	6.4	23.0
1994	P. Cod	Longline	4	1	351	723	1,075	2,425	683	868	2,876	6,586	0.0	5.3	11.0	16.3	36.8	10.4	13.2	43.7
1994	P. Cod	Longline	ALL	97	5,165	7,661	12,923	11,103	7,403	10,025	20,079	81,603	0.1	6.3	9.4	15.8	13.6	9.1	12.3	24.6
1994	P. Cod	ALL	ALL	362	16,020	30,941	47,323	65,433	21,088	27,652	86,957	178,481	0.2	9.0	17.3	26.5	36.7	11.8	15.5	48.7
1994	Atka mackerel	Trawl	1	0	118	8,365	8,483	46	1,086	7,674	8529	25,457	0.0	0.5	32.9	33.3	0.2	4.3	30.1	33.5
1994	Atka mackerel	Trawl	2	549	3,506	20,355	24,410	8	24,316	18,931	24410	27,818	2.0	12.6	73.2	87.7	0.0	87.4	68.1	87.7
1994	Atka mackerel	Trawl	3	0	334	10,908	11,242	21	11,227	11,206	11246	11,251	0.0	3.0	97.0	99.9	0.2	99.8	99.6	100.0
1994	Atka mackerel	Trawl	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Atka mackerel	Trawl	ALL	549	3,958	39,628	44,135	75	36,629	37,811	44,185	64,526	0.9	6.1	61.4	68.4	0.1	56.8	58.6	68.5
1994	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Atka mackerel	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Atka mackerel	Pot	ALL	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Atka mackerel	Longline	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Atka mackerel	Longline	3	0	1	0	1	1	1	1	1	1	0.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0
1994	Atka mackerel	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	Atka mackerel	Longline	ALL	0	1	0	1	1	1	1	1	1	0.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0
1994	Atka mackerel	ALL	ALL	549	3,959	39,628	44,136	76	36,630	37,812	44,186	64,527	0.9	6.1	61.4	68.4	0.1	56.8	58.6	68.5
1995	Pollock	Trawl	1	5,080	67,974	64,813	137,867	493,664	26,039	56,660	555,879	633,454	0.8	10.7	10.2	21.8	77.9	4.1	8.9	87.8
1995	Pollock	Trawl	2	0	724	4,623	5,347	8,400	1,909	81	8,538	12,397	0.0	5.8	37.3	43.1	67.8	15.4	0.7	68.9
1995	Pollock	Trawl	3	125	11,457	132,288	143,870	283,239	123,323	51,856	284,621	614,621	0.0	1.9	21.5	23.4	46.1	20.1	8.4	46.3
1995	Pollock	Trawl	4	0	222	17,583	17,805	39,834	15,604	902	39,834	54,367	0.0	0.4	32.3	32.7	73.3	28.7	1.7	73.3
1995	Pollock	Trawl	ALL	5,205	80,377	219,307	304,889	825,137	166,875	109,499	888,872	1,314,839	0.4	6.1	16.7	23.2	62.8	12.7	8.3	67.6
1995	Pollock	Pot	1	0	4	0	4	4	4	4	4	4	0.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0
1995	Pollock	Pot	2	0	0	2	2	2	1	1	2	3	0.0	0.0	66.7	66.7	66.7	33.3	33.3	66.7
1995	Pollock	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	Pollock	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	Pollock	Pot	ALL	0	4	2	6	6	5	5	6	7	0.0	55.7	27.8	83.5	83.5	69.6	69.6	83.5
1995	Pollock	Longline	1	0	1	117	118	45	46	111	153	1,012	0.0	0.1	11.6	11.7	4.4	4.5	11.0	15.1
1995	Pollock	Longline	2	0	0	5	5	49	0	0	49	154	0.0	0.0	3.2	3.2	31.8	0.0	0.0	31.8
1995	Pollock	Longline	3	0	11	3	14	17	13	13	18	149	0.0	7.4	2.0	9.4	11.4	8.7	8.7	12.1
1995	Pollock	Longline	4	0	1	3	4	6	1	4	9	192	0.0	0.5	1.6	2.1	3.1	0.5	2.1	4.7
1995	Pollock	Longline	ALL	0	13	128	141	117	60	128	229	1,507	0.0	0.9	8.5	9.4	7.8	4.0	8.5	15.2
1995	Pollock	ALL	ALL	5,205	80,394	219,437	305,036	825,260	166,940	109,632	889,107	1,316,353	0.4	6.1	16.7	23.2	62.7	12.7	8.3	67.5
1995	P. Cod	Trawl	1	1,014	4,153	17,930	23,097	46,598	3,201	6,794	53,899	69,047	1.5	6.0	26.0	33.5	67.5	4.6	9.8	78.1
1995	P. Cod	Trawl	2	14	4,487	14,188	18,688	21,768	1,943	727	23,900	29,235	0.0	15.3	48.5	63.9	74.5	6.6	2.5	81.8
1995	P. Cod	Trawl	3	2	243	1,363	1,608	2,532	1,430	1,016	3,060	20,967	0.0	1.2	6.5	7.7	12.1	6.8	4.8	14.6
1995	P. Cod	Trawl	4	0	26	329	354	607	63	2	607	2,281	0.0	1.1	14.4	15.5	26.6	2.8	0.1	26.6

Year	Fishery	Gear	Quarter	BSAI Catch Amounts in mt expanded from the Blend estimates									BSAI Catch Amounts in PERCENT expanded from the Blend estimates							
				0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1995	P. Cod	Trawl	ALL	1,029	8,909	33,809	43,747	71,505	6,637	8,539	81,466	121,530	0.8	7.3	27.8	36.0	58.8	5.5	7.0	67.0
1995	P. Cod	Pot	1	13	1,538	674	2,226	2,432	1,933	1,791	2,461	2,537	0.5	60.6	26.6	87.7	95.9	76.2	70.6	97.0
1995	P. Cod	Pot	2	238	4,986	4,360	9,584	10,208	7,098	5,658	10,656	11,697	2.0	42.6	37.3	81.9	87.3	60.7	48.4	91.1
1995	P. Cod	Pot	3	10	836	897	1,744	1,767	1,358	1,331	2,089	2,780	0.4	30.1	32.3	62.7	63.6	48.8	47.9	75.1
1995	P. Cod	Pot	4	1	814	1,162	1,978	2,215	1,838	1,548	2,316	2,393	0.1	34.0	48.6	82.6	92.6	76.8	64.7	96.8
1995	P. Cod	Pot	ALL	263	8,175	7,093	15,531	16,623	12,227	10,328	17,521	19,407	1.4	42.1	36.5	80.0	85.7	63.0	53.2	90.3
1995	P. Cod	Longline	1	0	1,059	6,268	7,327	5,038	3,217	6,553	10,700	50,452	0.0	2.1	12.4	14.5	10.0	6.4	13.0	21.2
1995	P. Cod	Longline	2	0	1,324	1,483	2,807	6,654	1,993	2,323	7,683	22,649	0.0	5.8	6.5	12.4	29.4	8.8	10.3	33.9
1995	P. Cod	Longline	3	65	1,395	869	2,329	3,239	1,655	2,023	3,934	13,596	0.5	10.3	6.4	17.1	23.8	12.2	14.9	28.9
1995	P. Cod	Longline	4	321	598	2,206	3,125	2,169	816	2,750	4,327	15,899	2.0	3.8	13.9	19.7	13.6	5.1	17.3	27.2
1995	P. Cod	Longline	ALL	387	4,376	10,826	15,589	17,101	7,681	13,648	26,644	102,597	0.4	4.3	10.6	15.2	16.7	7.5	13.3	26.0
1995	P. Cod	ALL	ALL	1,679	21,459	51,728	74,867	105,230	26,545	32,515	125,631	243,534	0.7	8.8	21.2	30.7	43.2	10.9	13.4	51.6
1995	Atka mackerel	Trawl	1	94	4,230	38,902	43,226	23	38,365	32,099	43,249	51,995	0.2	8.1	74.8	83.1	0.0	73.8	61.7	83.2
1995	Atka mackerel	Trawl	2	103	1,768	17,584	19,455	23	18,760	4,602	19,474	23,353	0.4	7.6	75.3	83.3	0.1	80.3	19.7	83.4
1995	Atka mackerel	Trawl	3	0	172	5,033	5,205	159	5,205	4,681	5,206	5,295	0.0	3.2	95.1	98.3	3.0	98.3	88.4	98.3
1995	Atka mackerel	Trawl	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	Atka mackerel	Trawl	ALL	197	6,170	61,519	67,886	205	62,330	41,382	67,929	80,643	0.2	7.7	76.3	84.2	0.3	77.3	51.3	84.2
1995	Atka mackerel	Pot	1	0	2	2	4	4	4	4	4	4	0.0	50.0	50.0	100.0	100.0	100.0	100.0	100.0
1995	Atka mackerel	Pot	2	0	1	0	1	1	1	1	1	1	0.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0
1995	Atka mackerel	Pot	3	0	7	2	9	9	9	9	9	9	0.0	77.8	22.2	100.0	100.0	100.0	100.0	100.0
1995	Atka mackerel	Pot	4	0	2	0	2	2	2	2	2	2	0.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0
1995	Atka mackerel	Pot	ALL	0	12	4	16	16	16	16	16	16	0.0	75.0	25.0	100.0	100.0	100.0	100.0	100.0
1995	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	Atka mackerel	Longline	2	0	1	1	2	2	2	2	2	2	0.0	50.0	50.0	100.0	100.0	100.0	100.0	100.0
1995	Atka mackerel	Longline	3	0	10	1	11	11	11	11	11	11	0.0	90.9	9.1	100.0	100.0	100.0	100.0	100.0
1995	Atka mackerel	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	Atka mackerel	Longline	ALL	0	11	2	13	13	13	13	13	13	0.0	84.6	15.4	100.0	100.0	100.0	100.0	100.0
1995	Atka mackerel	ALL	ALL	197	6,193	61,525	67,915	234	62,359	41,411	67,958	80,672	0.2	7.7	76.3	84.2	0.3	77.3	51.3	84.2
1996	Pollock	Trawl	1	2,217	29,941	63,017	95,175	241,352	10,907	30,618	271,386	498,347	0.4	6.0	12.6	19.1	48.4	2.2	6.1	54.5
1996	Pollock	Trawl	2	0	724	7,956	8,680	12,691	4,195	283	12,969	18,749	0.0	3.9	42.4	46.3	67.7	22.4	1.5	69.2
1996	Pollock	Trawl	3	0	5,183	81,190	86,373	195,970	66,540	27,628	196,695	381,085	0.0	1.4	21.3	22.7	51.4	17.5	7.2	51.6
1996	Pollock	Trawl	4	58	1,183	24,495	25,737	102,263	17,194	6,992	102,441	200,639	0.0	0.6	12.2	12.8	51.0	8.6	3.5	51.1
1996	Pollock	Trawl	ALL	2,276	37,031	176,658	215,965	552,276	98,836	65,521	583,492	1,098,820	0.2	3.4	16.1	19.7	50.3	9.0	6.0	53.1
1996	Pollock	Pot	1	0	7	1	7	7	7	7	8	9	0.6	76.9	5.8	83.3	82.6	81.4	80.4	86.6
1996	Pollock	Pot	2	0	6	3	9	8	8	8	9	12	0.4	46.7	23.8	70.9	70.1	65.6	64.4	72.5
1996	Pollock	Pot	3	0	0	1	1	2	1	1	2	4	0.0	3.7	34.0	37.6	44.6	36.3	33.8	61.2
1996	Pollock	Pot	4	0	0	0	0	0	0	0	0	1	0.0	12.2	17.0	29.2	43.8	22.9	25.5	47.1
1996	Pollock	Pot	ALL	0	13	5	17	18	17	16	19	25	0.4	49.8	18.9	69.2	70.0	65.6	64.4	75.1
1996	Pollock	Longline	1	0	33	100	133	104	56	119	231	1,473	0.0	2.2	6.8	9.0	7.1	3.8	8.1	15.7
1996	Pollock	Longline	2	0	4	56	61	12	35	54	69	389	0.0	1.2	14.5	15.6	3.2	9.0	13.8	17.7
1996	Pollock	Longline	3	0	6	19	25	61	6	25	82	429	0.0	1.4	4.3	5.7	14.2	1.4	5.7	19.1
1996	Pollock	Longline	4	0	3	6	9	144	1	8	161	602	0.0	0.5	1.0	1.5	23.9	0.2	1.4	26.7
1996	Pollock	Longline	ALL	0	46	181	228	322	98	206	543	2,893	0.0	1.6	6.3	7.9	11.1	3.4	7.1	18.8
1996	Pollock	ALL	ALL	2,276	37,090	176,845	216,210	552,615	98,951	65,743	584,054	1,101,738	0.2	3.4	16.1	19.6	50.2	9.0	6.0	53.0
1996	P. Cod	Trawl	1	67	5,487	15,100	20,654	30,602	3,461	8,986	40,677	59,397	0.1	9.2	25.4	34.8	51.5	5.8	15.1	68.5
1996	P. Cod	Trawl	2	5	2,453	5,689	8,147	14,991	2,627	1,285	17,504	29,105	0.0	8.4	19.5	28.0	51.5	9.0	4.4	60.1
1996	P. Cod	Trawl	3	0	122	3,840	3,962	2,691	2,924	2,519	5,813	12,690	0.0	1.0	30.3	31.2	21.2	23.0	19.9	45.8
1996	P. Cod	Trawl	4	10	182	1,513	1,705	3,394	1,053	756	3,639	5,613	0.2	3.2	27.0	30.4	60.5	18.8	13.5	64.8
1996	P. Cod	Trawl	ALL	82	8,245	26,142	34,468	51,677	10,065	13,547	67,632	106,805	0.1	7.7	24.5	32.3	48.4	9.4	12.7	63.3
1996	P. Cod	Pot	1	107	3,769	1,064	4,940	4,303	4,102	3,599	5,181	5,590	1.9	67.4	19.0	88.4	77.0	73.4	64.4	92.7
1996	P. Cod	Pot	2	293	7,774	3,859	11,926	10,120	9,015	8,146	12,608	16,139	1.8	48.2	23.9	73.9	62.7	55.9	50.5	78.1
1996	P. Cod	Pot	3	128	891	1,168	2,188	1,624	1,805	1,856	2,727	3,837	3.3	23.2	30.4	57.0	42.3	47.0	48.4	71.1
1996	P. Cod	Pot	4	13	1,510	480	2,004	1,967	1,770	1,903	2,085	2,698	0.5	56.0	17.8	74.3	72.9	65.6	70.5	76.5

Year	Fishery	Gear	Quarter	BSAI Catch Amounts in mt expanded from the Blend estimates 0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	BSAI Catch Amounts in PERCENT expanded from the Blend estimates 0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1996	P. Cod	Pot	ALL	541	13,944	6,572	21,057	18,016	16,692	15,505	22,581	28,264	1.9	49.3	23.3	74.5	63.7	59.1	54.9	79.9
1996	P. Cod	Longline	1	0	1,589	5,534	7,123	4,716	3,361	6,260	9,996	44,945	0.0	3.5	12.3	15.8	10.5	7.5	13.9	22.2
1996	P. Cod	Longline	2	63	1,439	2,289	3,791	1,868	2,195	3,447	4,781	16,904	0.4	8.5	13.5	22.4	11.1	13.0	20.4	28.3
1996	P. Cod	Longline	3	8	227	662	897	1,698	166	866	2,439	11,519	0.1	2.0	5.7	7.8	14.7	1.4	7.5	21.2
1996	P. Cod	Longline	4	4	511	472	986	3,122	600	582	3,853	13,489	0.0	3.8	3.5	7.3	23.1	4.4	4.3	28.6
1996	P. Cod	Longline	ALL	75	3,765	8,956	12,796	11,404	6,323	11,155	21,069	86,857	0.1	4.3	10.3	14.7	13.1	7.3	12.8	24.3
1997	P. Cod	ALL	ALL	698	25,955	41,669	68,322	81,097	33,080	40,206	111,281	221,926	0.3	11.7	18.8	30.8	36.5	14.9	18.1	50.1
1996	Atka mackerel	Trawl	1	103	7,244	20,538	27,885	54	17,455	20,077	27,914	41,587	0.2	17.4	49.4	67.1	0.1	42.0	48.3	67.1
1996	Atka mackerel	Trawl	2	40	1,630	18,503	20,172	23	19,743	5,014	20,172	27,067	0.1	6.0	68.4	74.5	0.1	72.9	18.5	74.5
1996	Atka mackerel	Trawl	3	0	512	20,819	21,331	532	17,129	14,420	21,340	24,615	0.0	2.1	84.6	86.7	2.2	69.6	58.6	86.7
1996	Atka mackerel	Trawl	4	5	7	271	283	88	54	263	334	563	0.9	1.2	48.2	50.2	15.6	9.6	46.7	59.4
1996	Atka mackerel	Trawl	ALL	147	9,392	60,131	69,671	696	54,381	39,774	69,760	93,831	0.2	10.0	64.1	74.3	0.7	58.0	42.4	74.3
1996	Atka mackerel	Pot	1	0	4	1	6	6	5	5	6	6	0.2	78.5	21.3	100.0	100.0	99.8	99.3	100.0
1996	Atka mackerel	Pot	2	0	16	12	28	28	26	24	28	28	0.7	55.6	43.6	99.9	99.1	93.4	87.6	99.9
1996	Atka mackerel	Pot	3	0	3	6	9	8	8	8	9	9	1.2	37.0	61.2	99.4	90.9	87.2	83.2	99.4
1996	Atka mackerel	Pot	4	0	7	3	10	10	9	9	10	10	0.1	69.6	30.3	100.0	99.2	90.6	93.2	100.0
1996	Atka mackerel	Pot	ALL	0	30	22	53	52	49	47	53	53	0.7	57.4	41.8	99.9	97.7	92.4	89.1	99.9
1996	Atka mackerel	Longline	1	0	1	2	3	1	2	3	3	4	0.0	23.3	66.2	89.5	19.9	50.0	83.5	94.4
1996	Atka mackerel	Longline	2	2	11	2	15	2	12	14	15	18	11.2	63.4	9.6	84.2	13.2	69.5	78.8	84.2
1996	Atka mackerel	Longline	3	0	7	0	7	6	6	7	7	7	2.5	94.7	1.9	99.0	83.9	91.0	99.0	99.0
1996	Atka mackerel	Longline	4	0	3	4	7	1	7	2	7	8	0.0	43.2	51.8	94.9	17.6	92.2	20.3	94.9
1996	Atka mackerel	Longline	ALL	2	22	8	32	10	27	25	32	36	6.0	61.1	22.8	89.9	28.4	76.7	70.5	90.4
1996	Atka mackerel	ALL	ALL	150	9,445	60,161	69,756	758	54,457	39,846	69,845	93,919	0.2	10.1	64.1	74.3	0.8	58.0	42.4	74.4
1997	Pollock	Trawl	1	2,430	29,531	58,323	90,284	333,078	9,659	30,176	358,731	492,477	0.5	6.0	11.8	18.3	67.6	2.0	6.1	72.8
1997	Pollock	Trawl	2	0	652	1,231	1,883	3,894	427	354	4,304	9,192	0.0	7.1	13.4	20.5	42.4	4.6	3.8	46.8
1997	Pollock	Trawl	3	0	4,355	59,318	63,673	146,332	39,910	21,065	146,602	434,686	0.0	1.0	13.6	14.6	33.7	9.2	4.8	33.7
1997	Pollock	Trawl	4	0	1,917	13,803	15,720	61,080	13,272	6,187	60,992	97,403	0.0	2.0	14.2	16.1	62.7	13.6	6.4	62.6
1997	Pollock	Trawl	ALL	2,430	36,455	132,675	171,560	544,385	63,268	57,781	570,628	1,033,757	0.2	3.5	12.8	16.6	52.7	6.1	5.6	55.2
1997	Pollock	Pot	1	0	0	0	1	0	1	1	1	1	0.0	29.4	70.6	100.0	30.2	100.0	92.8	100.0
1997	Pollock	Pot	2	0	6	19	25	27	18	15	28	29	0.2	19.6	67.6	87.3	93.9	63.4	52.6	96.7
1997	Pollock	Pot	3	0	2	0	2	2	2	2	2	29	0.0	6.3	1.5	7.8	7.8	7.2	7.0	7.8
1997	Pollock	Pot	4	0	0	0	1	1	1	1	1	5	0.0	9.8	5.3	15.0	15.0	14.5	13.8	15.0
1997	Pollock	Pot	ALL	0	8	21	29	30	22	18	31	63	0.1	12.8	32.6	45.5	47.8	34.3	29.2	49.8
1997	Pollock	Longline	1	0	25	406	431	122	197	407	552	1,688	0.0	1.5	24.0	25.5	7.2	11.6	24.1	32.7
1997	Pollock	Longline	2	0	46	32	78	164	59	61	231	637	0.0	7.2	5.0	12.3	25.7	9.2	9.6	36.2
1997	Pollock	Longline	3	0	5	17	22	49	0	22	71	382	0.0	1.4	4.4	5.8	12.8	0.0	5.8	18.5
1997	Pollock	Longline	4	0	21	92	113	251	29	87	337	1,727	0.0	1.2	5.3	6.5	14.5	1.7	5.1	19.5
1997	Pollock	Longline	ALL	0	97	546	644	585	284	578	1,190	4,433	0.0	2.2	12.3	14.5	13.2	6.4	13.0	26.8
1997	Pollock	ALL	ALL	2,430	36,561	133,241	172,232	545,000	63,574	58,378	571,850	1,038,254	0.2	3.5	12.8	16.6	52.5	6.1	5.6	55.1
1997	P. Cod	Trawl	1	328	5,002	17,298	22,628	38,498	3,597	9,454	48,885	68,783	0.5	7.3	25.1	32.9	56.0	5.2	13.7	71.1
1997	P. Cod	Trawl	2	0	2,143	4,930	7,073	11,206	1,301	947	12,551	20,754	0.0	10.3	23.8	34.1	54.0	6.3	4.6	60.5
1997	P. Cod	Trawl	3	0	23	272	295	1,306	155	78	1,325	9,186	0.0	0.2	3.0	3.2	14.2	1.7	0.8	14.4
1997	P. Cod	Trawl	4	0	16	81	97	783	68	39	783	4,406	0.0	0.4	1.8	2.2	17.8	1.5	0.9	17.8
1997	P. Cod	Trawl	ALL	328	7,183	22,581	30,093	51,792	5,122	10,518	63,544	103,129	0.3	7.0	21.9	29.2	50.2	5.0	10.2	61.6
1997	P. Cod	Pot	1	0	263	147	410	417	410	366	477	477	0.0	55.1	30.9	86.0	87.4	86.0	76.6	100.0
1997	P. Cod	Pot	2	52	7,418	3,800	11,270	11,672	8,585	7,584	12,480	13,572	0.4	54.7	28.0	83.0	86.0	63.3	55.9	92.0
1997	P. Cod	Pot	3	0	537	256	793	752	673	677	798	2,100	0.0	25.6	12.2	37.8	35.8	32.1	32.2	38.0
1997	P. Cod	Pot	4	9	1,117	663	1,789	1,808	1,688	1,646	1,814	2,561	0.4	43.6	25.9	69.9	70.6	65.9	64.3	70.8
1997	P. Cod	Pot	ALL	62	9,335	4,867	14,263	14,649	11,357	10,272	15,569	18,710	0.3	49.9	26.0	76.2	78.3	60.7	54.9	83.2
1997	P. Cod	Longline	1	0	2,091	8,109	10,201	4,358	4,898	9,630	13,418	50,396	0.0	4.2	16.1	20.2	8.6	9.7	19.1	26.6
1997	P. Cod	Longline	2	58	2,457	2,050	4,564	4,160	3,758	3,829	7,540	21,665	0.3	11.3	9.5	21.1	19.2	17.3	17.7	34.8
1997	P. Cod	Longline	3	0	112	405	517	870	18	511	1,370	7,908	0.0	1.4	5.1	6.5	11.0	0.2	6.5	17.3
1997	P. Cod	Longline	4	20	523	2,118	2,661	4,459	961	2,067	6,246	33,079	0.1	1.6	6.4	8.0	13.5	2.9	6.2	18.9

				BSAI Catch Amounts in mt expanded from the Blend estimates									BSAI Catch Amounts in PERCENT expanded from the Blend estimates							
Year	Fishery	Gear	Quarter	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1997	P. Cod	Longline	ALL	78	5,183	12,682	17,943	13,848	9,636	16,038	28,575	113,049	0.1	4.6	11.2	15.9	12.2	8.5	14.2	25.3
1997	P. Cod	ALL	ALL	467	21,702	40,130	62,298	80,288	26,115	36,827	107,688	234,888	0.2	9.2	17.1	26.5	34.2	11.1	15.7	45.8
1997	Atka mackerel	Trawl	1	1,524	4,010	29,198	34,732	4	24,939	22,077	34,736	42,426	3.6	9.5	68.8	81.9	0.0	58.8	52.0	81.9
1997	Atka mackerel	Trawl	2	0	8	12,629	12,637	0	12,636	7,553	12,637	16,174	0.0	0.1	78.1	78.1	0.0	78.1	46.7	78.1
1997	Atka mackerel	Trawl	3	0	1	60	61	71	54	40	71	75	0.0	1.5	79.7	81.1	93.9	71.5	52.6	93.9
1997	Atka mackerel	Trawl	4	0	16	6	22	23	21	20	23	23	0.0	69.4	25.6	95.0	100.0	93.5	89.4	100.0
1997	Atka mackerel	Trawl	ALL	1,524	4,035	41,892	47,451	97	37,650	29,690	47,466	58,697	2.6	6.9	71.4	80.8	0.2	64.1	50.6	80.9
1997	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	Atka mackerel	Pot	2	0	12	9	20	20	20	14	20	21	0.2	57.1	42.2	99.6	96.9	96.8	70.3	99.6
1997	Atka mackerel	Pot	3	0	7	3	10	10	9	9	10	10	0.0	65.3	34.6	99.9	99.1	93.3	90.2	100.0
1997	Atka mackerel	Pot	4	0	8	10	18	18	17	15	18	18	0.0	43.3	56.7	100.0	100.0	94.1	83.4	100.0
1997	Atka mackerel	Pot	ALL	0	26	22	48	47	46	38	48	48	0.1	53.8	45.9	99.8	98.5	95.1	79.2	99.8
1997	Atka mackerel	Longline	1	0	1	0	1	0	0	1	1	1	0.0	64.6	15.0	79.6	21.3	38.1	78.5	79.6
1997	Atka mackerel	Longline	2	1	25	12	38	16	38	37	38	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	Atka mackerel	Longline	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	Atka mackerel	Longline	4	0	0	0	0	0	0	0	0	0	0.0	24.7	55.6	80.3	0.0	80.3	69.6	80.3
1997	Atka mackerel	Longline	ALL	1	25	12	39	16	38	37	39	40	3.7	63.7	29.8	97.3	41.2	95.5	93.7	97.8
1997	Atka mackerel	ALL	ALL	1,525	4,087	41,926	47,538	161	37,734	29,765	47,553	58,785	2.6	7.0	71.3	80.9	0.3	64.2	50.6	80.9
1998	Pollock	Trawl	1	1,311	35,697	75,844	112,852	402,464	4,055	49,438	420,169	541,773	0.2	6.6	14.0	20.8	74.3	0.7	9.1	77.6
1998	Pollock	Trawl	2	0	411	432	844	688	230	520	1,236	3,748	0.0	11.0	11.5	22.5	18.4	6.1	13.9	33.0
1998	Pollock	Trawl	3	1,559	10,162	58,175	69,896	122,748	52,896	30,007	123,214	345,862	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Pollock	Trawl	4	543	3,361	27,319	31,223	99,252	18,568	7,529	99,363	230,371	0.2	1.5	11.9	13.6	43.1	8.1	3.3	43.1
1998	Pollock	Trawl	ALL	3,414	49,632	161,770	214,816	625,152	75,750	87,494	643,984	1,121,753	0.3	4.4	14.4	19.1	55.7	6.8	7.8	57.4
1998	Pollock	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Pollock	Pot	2	1	22	6	29	31	22	19	31	34	2.9	64.5	17.7	85.1	92.2	65.8	57.0	90.9
1998	Pollock	Pot	3	0	1	0	2	2	2	2	2	8	0.0	17.4	4.0	21.3	18.8	18.8	21.3	21.3
1998	Pollock	Pot	4	0	0	0	0	0	0	0	0	1	0.0	0.0	27.8	27.8	31.9	27.8	2.1	31.9
1998	Pollock	Pot	ALL	1	23	7	31	33	24	21	33	43	2.3	54.1	15.2	71.6	76.8	55.9	49.1	76.2
1998	Pollock	Longline	1	0	79	395	474	115	108	437	566	1,519	0.0	5.2	26.0	31.2	7.6	7.1	28.7	37.3
1998	Pollock	Longline	2	0	24	85	110	26	40	102	133	563	0.1	4.3	15.1	19.5	4.7	7.0	18.2	23.5
1998	Pollock	Longline	3	0	4	11	15	34	2	14	48	219	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Pollock	Longline	4	0	25	56	81	111	21	58	177	999	0.0	2.5	5.6	8.1	11.1	2.1	5.8	17.7
1998	Pollock	Longline	ALL	1	132	547	680	286	170	612	923	3,301	0.0	4.0	16.6	20.6	8.7	5.1	18.5	28.0
1998	Pollock	ALL	ALL	3,416	49,787	162,323	215,526	625,472	75,944	88,127	644,940	1,125,098	0.3	4.4	14.4	19.2	55.6	6.7	7.8	57.3
1998	P. Cod	Trawl	1	315	4,885	19,058	24,258	23,035	5,341	11,102	35,420	47,747	0.7	10.2	39.9	50.8	48.2	11.2	23.3	74.2
1998	P. Cod	Trawl	2	2	1,784	3,549	5,335	5,824	1,181	728	7,010	10,368	0.0	17.2	34.2	51.5	56.2	11.4	7.0	67.6
1998	P. Cod	Trawl	3	0	57	1,019	1,076	1,340	1,036	640	1,622	8,946	0.0	0.6	11.4	12.0	15.0	11.6	7.2	18.1
1998	P. Cod	Trawl	4	1	743	1,522	2,266	1,757	1,835	1,829	3,020	7,650	0.0	9.7	19.9	29.6	23.0	24.0	23.9	39.5
1998	P. Cod	Trawl	ALL	318	7,469	25,148	32,935	31,956	9,393	14,299	47,072	74,711	0.4	10.0	33.7	44.1	42.8	12.6	19.1	63.0
1998	P. Cod	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	P. Cod	Pot	2	317	5,625	2,242	8,184	8,611	6,923	6,638	8,963	10,097	3.1	55.7	22.2	81.1	85.3	68.6	65.7	88.8
1998	P. Cod	Pot	3	0	127	505	632	229	193	601	653	2,616	0.0	4.9	19.3	24.2	8.8	7.4	23.0	25.0
1998	P. Cod	Pot	4	8	92	158	258	247	219	222	376	538	1.5	17.1	29.4	48.0	45.9	40.7	41.3	69.9
1998	P. Cod	Pot	ALL	325	5,844	2,905	9,074	9,087	7,335	7,461	9,992	13,251	2.5	44.1	21.9	68.5	68.6	55.4	56.3	75.4
1998	P. Cod	Longline	1	82	3,135	7,974	11,191	23,035	4,007	10,011	13,426	46,075	0.2	6.8	17.3	24.3	50.0	8.7	21.7	29.1
1998	P. Cod	Longline	2	335	2,853	2,210	5,398	5,824	3,941	3,884	5,948	15,330	2.2	18.6	14.4	35.2	38.0	25.7	25.3	38.8
1998	P. Cod	Longline	3	0	375	451	826	1,340	356	655	1,635	5,664	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	P. Cod	Longline	4	81	2,069	2,851	5,001	1,757	2,481	3,728	8,139	28,296	0.3	7.3	10.1	17.7	6.2	8.8	13.2	28.8
1998	P. Cod	Longline	ALL	498	8,432	13,486	22,416	31,956	10,785	18,278	29,148	95,365	0.5	8.8	14.1	23.5	33.5	11.3	19.2	30.6
1998	P. Cod	ALL	ALL	1,141	21,745	41,539	64,425	72,999	27,513	40,038	86,212	183,327	0.6	11.9	22.7	35.1	39.8	15.0	21.8	47.0
1998	Atka mackerel	Trawl	1	66	2,478	25,657	28,201	0	22,686	13,944	28,201	35,488	0.2	7.0	72.3	79.5	0.0	63.9	39.3	79.5
1998	Atka mackerel	Trawl	2	0	0	6,660	6,660	96	6,616	2,516	6,697	8,567	0.0	0.0	77.7	77.7	1.1	77.2	29.4	78.2
1998	Atka mackerel	Trawl	3	1	105	3,535	3,641	715	3,627	2,489	3,642	4,202	0.0	2.5	84.1	86.6	17.0	86.3	59.2	86.7

				BSAI Catch Amounts in mt expanded from the Blend estimates									BSAI Catch Amounts in PERCENT expanded from the Blend estimates							
Year	Fishery	Gear	Quarter	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1998	Atka mackerel	Trawl	4	0	391	6,773	7,164	281	6,759	5,301	7,164	8,112	0.0	4.8	83.5	88.3	3.5	83.3	65.3	88.3
1998	Atka mackerel	Trawl	ALL	67	2,974	42,625	45,666	1,092	39,688	24,250	45,704	56,369	0.1	5.3	75.6	81.0	1.9	70.4	43.0	81.1
1998	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Atka mackerel	Pot	2	0	2	0	2	1	2	2	2	2	0.0	100.0	0.0	100.0	50.0	100.0	100.0	100.0
1998	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Atka mackerel	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Atka mackerel	Pot	ALL	0	2	0	2	1	2	2	2	2	0.0	100.0	0.0	100.0	50.0	100.0	100.0	100.0
1998	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Atka mackerel	Longline	2	1	2	1	4	0	3	3	3	3	33.3	66.7	33.3	133.3	0.0	100.0	100.0	100.0
1998	Atka mackerel	Longline	3	0	0	0	0	0	0	0	0	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Atka mackerel	Longline	4	0	9	1	10	1	10	6	10	10	0.0	90.0	10.0	100.0	10.0	100.0	60.0	100.0
1998	Atka mackerel	Longline	ALL	1	11	2	14	1	13	9	13	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Atka mackerel	ALL	ALL	68	2,987	42,627	45,682	1,094	39,703	24,261	45,719	56,387	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Pollock	Trawl	1	7	421	15,644	16,072	191,604	262	1,215	193,230	404,165	0.0	0.1	3.9	4.0	47.4	0.1	0.3	47.8
1999	Pollock	Trawl	2	17	59	446	522	1,359	370	280	1,696	6,407	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Pollock	Trawl	3	0	631	24,017	24,648	122,228	1,398	3,714	125,603	452,602	0.0	0.1	5.3	5.4	27.0	0.3	0.8	27.8
1999	Pollock	Trawl	4	0	2	1,352	1,354	8,351	262	101	8,368	115,195	0.0	0.0	1.2	1.2	7.2	0.2	0.1	7.3
1999	Pollock	Trawl	ALL	24	1,113	41,459	42,596	323,542	2,292	5,310	328,897	978,369	0.0	0.1	4.2	4.4	33.1	0.2	0.5	33.6
1999	Pollock	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Pollock	Pot	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Pollock	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Pollock	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Pollock	Pot	ALL	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Pollock	Longline	1	0	9	78	87	28	42	77	117	1,014	0.0	0.9	7.7	8.6	2.8	4.1	7.6	11.5
1999	Pollock	Longline	2	0	2	28	30	14	4	29	43	265	0.0	0.8	10.6	11.3	5.3	1.5	10.9	16.2
1999	Pollock	Longline	3	0	1	0	1	29	1	1	30	313	0.0	0.3	0.0	0.3	9.3	0.3	0.3	9.6
1999	Pollock	Longline	4	0	0	1	1	6	0	1	8	163	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Pollock	Longline	ALL	0	12	107	119	77	47	108	198	1,755	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Pollock	ALL	ALL	24	1,125	41,566	42,715	323,619	2,339	5,418	329,095	980,124	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	P. Cod	Trawl	1	135	5,286	17,141	22,563	24,431	3,840	12,133	36,614	47,240	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	P. Cod	Trawl	2	57	766	2,514	3,337	4,093	694	1,282	5,381	11,368	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	P. Cod	Trawl	3	0	154	693	846	755	682	453	1,371	7,192	0.0	2.1	9.6	11.8	10.5	9.5	6.3	19.1
1999	P. Cod	Trawl	4	0	6	396	401	356	312	143	620	2,489	0.0	0.2	15.9	16.1	14.3	12.5	5.7	24.9
1999	P. Cod	Trawl	ALL	192	6,212	20,744	27,147	29,635	5,527	14,011	43,986	68,290	0.3	9.1	30.4	39.8	43.4	8.1	20.5	64.4
1999	P. Cod	Pot	1	0	114	39	153	114	114	153	153	153	0.0	74.7	25.3	100.0	74.7	74.7	100.0	100.0
1999	P. Cod	Pot	2	266	5,103	4,862	10,232	7,235	6,606	6,205	11,029	13,491	2.0	37.8	36.0	75.8	53.6	49.0	46.0	81.8
1999	P. Cod	Pot	3	63	685	584	1,332	415	1,129	819	1,333	1,580	4.0	43.4	36.9	84.3	26.2	71.5	51.8	84.3
1999	P. Cod	Pot	4	0	414	163	578	699	526	511	698	912	0.0	45.4	17.9	63.3	76.6	57.7	56.0	76.5
1999	P. Cod	Pot	ALL	329	6,317	5,648	12,294	8,463	8,375	7,688	13,212	16,136	2.0	39.1	35.0	76.2	52.4	51.9	47.6	81.9
1999	P. Cod	Longline	1	30	2,104	7,518	9,653	4,240	5,103	8,000	12,240	45,172	0.1	4.7	16.6	21.4	9.4	11.3	17.7	27.1
1999	P. Cod	Longline	2	89	2,263	1,906	4,258	2,742	2,483	3,074	5,873	15,301	0.6	14.8	12.5	27.8	17.9	16.2	20.1	38.4
1999	P. Cod	Longline	3	20	492	208	720	1,139	555	543	1,814	13,767	0.1	3.6	1.5	5.2	8.3	4.0	3.9	13.2
1999	P. Cod	Longline	4	30	1,153	1,503	2,686	1,156	1,386	2,310	3,505	15,042	0.2	7.7	10.0	17.9	7.7	9.2	15.4	23.3
1999	P. Cod	Longline	ALL	169	6,011	11,136	17,317	9,277	9,527	13,927	23,432	89,282	0.2	6.7	12.5	19.4	10.4	10.7	15.6	26.2
1999	P. Cod	ALL	ALL	690	18,540	37,528	56,758	47,375	23,429	35,626	80,630	173,708	0.4	10.7	21.6	32.7	27.3	13.5	20.5	46.4
1999	Atka mackerel	Trawl	1	51	4,553	10,560	15,164	1	12,620	11,637	15,164	23,576	0.2	19.3	44.8	64.3	0.0	53.5	49.4	64.3
1999	Atka mackerel	Trawl	2	232	601	1,178	2,010	287	1,331	1,756	2,014	3,506	6.6	17.1	33.6	57.3	8.2	38.0	50.1	57.4
1999	Atka mackerel	Trawl	3	0	2,242	5,833	8,075	1,989	6,466	5,377	8,082	21,351	0.0	10.5	27.3	37.8	9.3	30.3	25.2	37.9
1999	Atka mackerel	Trawl	4	0	111	4,974	5,086	27	4,848	254	5,086	7,721	0.0	1.4	64.4	65.9	0.4	62.8	3.3	65.9
1999	Atka mackerel	Trawl	ALL	283	7,507	22,545	30,335	2,305	25,264	19,024	30,346	56,155	0.5	13:4	40.1	54.0	4.1	45.0	33.9	54.0
1999	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Atka mackerel	Pot	2	0	0	0	1	1	1	0	2	2	3.5	10.8	19.7	34.0	79.6	29.4	24.7	99.3
1999	Atka mackerel	Pot	3	0	2	1	4	3	3	2	4	4	2.0	57.1	37.9	96.9	74.3	91.1	63.6	97.4

Year	Fishery	Gear	Quarter	BSAI Catch Amounts in mt expanded from the Blend estimates 0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	BSAI Catch Amounts in PERCENT expanded from the Blend estimates 0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1999	Atka mackerel	Pot	4	0	4	2	5	6	5	5	6	5	0.0	80.8	34.3	115.1	122.4	115.1	106.9	122.4
1999	Atka mackerel	Pot	ALL	0	6	3	9	10	9	8	11	10	1.3	60.0	33.1	94.4	97.6	91.5	76.9	109.3
1999	Atka mackerel	Longline	1	0	4	2	6	0	6	3	6	6	0.5	69.8	32.0	102.3	3.9	94.2	42.7	95.8
1999	Atka mackerel	Longline	2	1	16	3	20	0	17	12	19	20	5.5	78.1	14.9	98.5	1.2	86.1	60.9	96.4
1999	Atka mackerel	Longline	3	0	12	3	15	0	15	12	16	16	0.4	78.3	19.3	97.9	0.0	99.0	76.1	99.9
1999	Atka mackerel	Longline	4	0	23	7	30	1	30	9	30	30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Atka mackerel	Longline	ALL	1	55	15	71	1	68	36	71	72	1.7	76.5	20.9	99.1	1.5	95.3	49.7	98.6
1999	Atka mackerel	ALL	ALL	285	7,568	22,563	30,416	2,316	25,342	19,067	30,427	56,236	0.5	13.5	40.1	54.1	4.1	45.1	33.9	54.1
2000	Pollock	Trawl	1	0	2,125	17,650	19,775	141,590	615	18,233	160,209	437,569	0.0	0.5	4.0	4.5	32.4	0.1	4.2	36.6
2000	Pollock	Trawl	2	87	255	1,060	1,402	3,197	331	427	3,604	13,969	0.6	1.8	7.6	10.0	22.9	2.4	3.1	25.8
2000	Pollock	Trawl	3	58	327	9,987	10,371	16,544	910	9,942	27,278	558,628	0.0	0.1	1.8	1.9	3.0	0.2	1.8	4.9
2000	Pollock	Trawl	4	0	0	0	0	40	0	0	40	118,363	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	Pollock	Trawl	ALL	146	2,706	28,696	31,548	161,371	1,856	28,601	191,131	1,128,529	0.0	0.2	2.5	2.8	14.3	0.2	2.5	16.9
2000	Pollock	Pot	1	0	12	28	41	20	24	28	47	57	0.0	21.3	49.4	70.7	35.3	41.1	49.0	81.1
2000	Pollock	Pot	2	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0
2000	Pollock	Pot	3	0	0	1	1	2	1	1	2	2	0.5	0.1	40.1	40.7	99.9	39.6	39.7	100.0
2000	Pollock	Pot	4	0	0	1	1	1	1	1	1	1	0.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0
2000	Pollock	Pot	ALL	0	12	30	42	23	25	30	49	60	0.0	20.3	49.9	70.2	38.4	42.0	49.5	82.0
2000	Pollock	Longline	1	1	58	242	302	264	141	242	530	2,116	0.0	2.8	11.5	14.2	12.5	6.7	11.4	25.0
2000	Pollock	Longline	2	0	2	14	16	25	8	11	40	139	0.0	1.1	10.2	11.3	18.1	5.9	8.2	28.4
2000	Pollock	Longline	3	0	29	65	94	132	50	77	176	918	0.0	3.1	7.0	10.2	14.4	5.5	8.4	19.2
2000	Pollock	Longline	4	1	42	140	183	341	83	120	424	1,950	0.0	2.2	7.2	9.4	17.5	4.3	6.2	21.7
2000	Pollock	Longline	ALL	2	131	461	594	762	283	451	1,170	5,124	0.0	2.6	9.0	11.6	14.9	5.5	8.8	22.8
2000	Pollock	ALL	ALL	147	2,849	29,188	32,184	162,156	2,164	29,082	192,350	1,133,713	0.0	0.3	2.6	2.8	14.3	0.2	2.6	17.0
2000	P. Cod	Trawl	1	264	3,064	17,145	20,474	18,455	3,453	11,381	31,125	46,385	0.6	6.6	37.0	44.1	39.8	7.4	24.5	67.1
2000	P. Cod	Trawl	2	18	1,224	3,498	4,739	8,377	902	954	9,309	15,706	0.1	7.8	22.3	30.2	53.3	5.7	6.1	59.3
2000	P. Cod	Trawl	3	0	8	201	210	228	162	124	390	9,079	0.0	0.1	2.2	2.3	2.5	1.8	1.4	4.3
2000	P. Cod	Trawl	4	0	0	0	0	0	0	0	0	3,005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	P. Cod	Trawl	ALL	282	4,296	20,844	25,422	27,060	4,517	12,458	40,823	74,174	0.4	5.8	28.1	34.3	36.5	6.1	16.8	55.0
2000	P. Cod	Pot	1	17	5,768	8,821	14,606	9,830	10,064	8,304	15,921	18,839	0.1	30.6	46.8	77.5	52.2	53.4	44.1	84.5
2000	P. Cod	Pot	2	0	0	0	0	0	0	0	0	0	0.0	27.8	56.1	83.9	97.3	29.9	82.3	97.3
2000	P. Cod	Pot	3	31	39	45	115	107	63	61	115	116	27.0	33.3	38.8	99.1	92.3	54.3	52.7	99.1
2000	P. Cod	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	100.0	100.0	51.2	51.2	100.0	100.0
2000	P. Cod	Pot	ALL	49	5,806	8,866	14,721	9,938	10,127	8,366	16,037	18,956	0.3	30.6	46.8	77.7	52.4	53.4	44.1	84.6
2000	P. Cod	Longline	1	213	5,251	8,372	13,837	9,416	5,907	10,934	19,888	44,405	0.5	11.8	18.9	31.2	21.2	13.3	24.6	44.8
2000	P. Cod	Longline	2	21	487	1,399	1,908	536	986	1,269	2,343	4,959	0.4	9.8	28.2	38.5	10.8	19.9	25.6	47.2
2000	P. Cod	Longline	3	72	1,756	2,154	3,982	3,731	2,504	3,094	6,356	18,659	0.4	9.4	11.5	21.3	20.0	13.4	16.6	34.1
2000	P. Cod	Longline	4	138	2,151	2,938	5,227	5,162	3,224	3,979	8,961	29,699	0.5	7.2	9.9	17.6	17.4	10.9	13.4	30.2
2000	P. Cod	Longline	ALL	444	9,645	14,864	24,953	18,845	12,622	19,276	37,548	97,721	0.5	9.9	15.2	25.5	19.3	12.9	19.7	38.4
2000	P. Cod	ALL	ALL	775	19,748	44,573	65,096	55,843	27,266	40,100	94,408	190,851	0.4	10.3	23.4	34.1	29.3	14.3	21.0	49.5
2000	Atka mackerel	Trawl	1	273	2,422	14,358	17,053	0	15,602	5,088	17,083	27,946	1.0	8.7	51.4	61.0	0.0	55.8	18.2	61.1
2000	Atka mackerel	Trawl	2	90	208	1,642	1,941	104	1,047	1,196	1,941	5,401	1.7	3.9	30.4	35.9	1.9	19.4	22.2	35.9
2000	Atka mackerel	Trawl	3	0	3	615	618	15	386	387	618	12,534	0.0	0.0	4.9	4.9	0.1	3.1	3.1	4.9
2000	Atka mackerel	Trawl	4	0	0	0	0	0	0	0	0	1,183	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	Atka mackerel	Trawl	ALL	364	2,634	16,615	19,613	119	17,036	6,672	19,642	47,064	0.8	5.6	35.3	41.7	0.3	36.2	14.2	41.7
2000	Atka mackerel	Pot	1	0	7	1	8	9	8	7	9	9	0.0	72.2	10.7	82.9	93.1	81.4	78.6	99.2
2000	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	0.0	30.8	67.0	97.7	2.7	68.3	39.6	97.7
2000	Atka mackerel	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	Atka mackerel	Pot	ALL	0	7	1	8	9	8	8	10	10	0.0	71.4	11.8	83.2	91.3	81.2	77.8	99.2
2000	Atka mackerel	Longline	1	0	29	6	36	1	32	25	36	36	1.0	81.9	16.4	99.3	1.7	89.6	68.2	99.4
2000	Atka mackerel	Longline	2	1	3	4	7	0	3	6	7	8	9.0	36.2	48.3	93.5	0.0	33.1	82.4	93.2
2000	Atka mackerel	Longline	3	2	23	20	45	0	44	34	45	45	3.8	50.2	44.4	98.4	0.1	98.0	74.0	98.4

Year	Fishery	Gear	Quarter	BSAI Catch Amounts in mt expanded from the Blend estimates									BSAI Catch Amounts in PERCENT expanded from the Blend estimates							
				0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
2000	Atka mackerel	Longline	4	6	31	22	60	1	55	44	60	63	9.8	49.6	35.6	95.0	2.2	87.6	70.7	96.0
2000	Atka mackerel	Longline	ALL	9	86	52	147	2	134	109	148	152	5.9	56.8	34.3	97.0	1.4	88.4	71.7	97.4
2000	Atka mackerel	ALL	ALL	373	2,727	16,668	19,768	130	17,178	6,788	19,800	47,226	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	Pollock	Trawl	1	0	3,176	37,582	40,758	122,108	786	39,714	161,358	512,175	0.0	0.6	7.3	8.0	23.8	0.2	7.8	31.5
2001	Pollock	Trawl	2	62	612	9,340	10,014	10,131	102	9,863	19,990	68,986	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	Pollock	Trawl	3	141	4,532	155,185	159,859	302,901	123,917	62,839	313,230	688,337	0.0	0.7	22.5	23.2	44.0	18.0	9.1	45.5
2001	Pollock	Trawl	4	0	388	26,228	26,617	59,370	21,397	6,793	60,737	110,727	0.0	0.4	23.7	24.0	53.6	19.3	6.1	54.9
2001	Pollock	Trawl	ALL	203	8,709	228,335	237,247	494,510	146,202	119,209	555,314	1,380,205	0.0	0.6	16.5	17.2	35.8	10.6	8.6	40.2
2001	Pollock	Pot	1	0	3	2	6	5	2	3	6	11	0.0	31.0	20.7	51.7	44.1	19.3	24.5	52.3
2001	Pollock	Pot	2	0	0	0	0	0	0	0	0	0	0.0	27.4	72.6	100.0	100.0	88.3	84.7	100.0
2001	Pollock	Pot	3	0	0	0	0	0	0	0	0	0	0.0	6.8	93.2	100.0	88.5	50.1	57.7	100.0
2001	Pollock	Pot	4	0	1	1	2	2	2	2	2	2	0.0	26.5	73.5	100.0	91.4	88.6	95.4	100.0
2001	Pollock	Pot	ALL	0	4	4	8	7	4	5	8	13	0.0	29.4	31.9	61.4	53.5	31.7	37.1	61.8
2001	Pollock	Longline	1	1	76	370	447	105	151	373	491	2,070	0.0	3.7	17.9	21.6	5.1	7.3	18.0	23.7
2001	Pollock	Longline	2	0	5	13	18	40	5	12	48	346	0.0	1.3	3.7	5.1	11.6	1.6	3.5	14.0
2001	Pollock	Longline	3	0	25	46	72	117	18	54	175	1,292	0.0	2.0	3.6	5.5	9.0	1.4	4.2	13.6
2001	Pollock	Longline	4	0	16	84	100	239	19	81	328	2,253	0.0	0.7	3.7	4.4	10.6	0.9	3.6	14.6
2001	Pollock	Longline	ALL	1	123	513	637	501	194	521	1,042	5,961	0.0	2.1	8.6	10.7	8.4	3.3	8.7	17.5
2001	Pollock	ALL	ALL	204	8,835	228,852	237,892	495,018	146,400	119,735	556,365	1,386,179	0.0	0.6	16.5	17.2	35.7	10.6	8.6	40.1
2001	P. Cod	Trawl	1	15	2,335	9,025	11,375	7,962	4,577	9,160	17,771	27,403	0.1	8.5	32.9	41.5	29.1	16.7	33.4	64.9
2001	P. Cod	Trawl	2	13	288	868	1,169	4,145	182	312	4,401	7,295	0.2	3.9	11.9	16.0	56.8	2.5	4.3	60.3
2001	P. Cod	Trawl	3	1	105	1,930	2,037	2,295	1,550	1,406	3,219	9,265	0.0	1.1	20.8	22.0	24.8	16.7	15.2	34.7
2001	P. Cod	Trawl	4	0	3	208	210	364	146	69	402	3,325	0.0	0.1	6.2	6.3	10.9	4.4	2.1	12.1
2001	P. Cod	Trawl	ALL	29	2,731	12,031	14,791	14,767	6,456	10,947	25,794	47,289	0.1	5.8	25.4	31.3	31.2	13.7	23.1	54.5
2001	P. Cod	Pot	1	80	1,161	5,876	7,116	6,110	3,741	4,972	7,851	9,914	0.8	11.7	59.3	71.8	61.6	37.7	50.1	79.2
2001	P. Cod	Pot	2	0	270	199	469	469	423	402	469	469	0.0	57.7	42.3	100.0	100.0	90.3	85.8	100.0
2001	P. Cod	Pot	3	1	167	981	1,148	1,009	964	1,004	1,155	3,945	0.0	4.2	24.9	29.1	25.6	24.4	25.5	29.3
2001	P. Cod	Pot	4	0	121	851	972	430	385	944	1,015	2,601	0.0	4.6	32.7	37.4	16.5	14.8	36.3	39.0
2001	P. Cod	Pot	ALL	80	1,719	7,906	9,705	8,018	5,514	7,322	10,490	16,929	0.5	10.2	46.7	57.3	47.4	32.6	43.3	62.0
2001	P. Cod	Longline	1	139	4,068	14,015	18,221	4,681	10,030	12,464	20,040	43,609	0.3	9.3	32.1	41.8	10.7	23.0	28.6	46.0
2001	P. Cod	Longline	2	4	206	587	797	1,049	211	603	1,612	7,468	0.1	2.8	7.9	10.7	14.0	2.8	8.1	21.6
2001	P. Cod	Longline	3	23	1,414	2,501	3,938	1,971	2,832	2,288	5,768	24,074	0.1	5.9	10.4	16.4	8.2	11.8	9.5	24.0
2001	P. Cod	Longline	4	11	567	2,799	3,377	4,098	1,162	2,399	7,005	32,624	0.0	1.7	8.6	10.4	12.6	3.6	7.4	21.5
2001	P. Cod	Longline	ALL	178	6,255	19,900	26,333	11,798	14,235	17,754	34,425	107,775	0.2	5.8	18.5	24.4	10.9	13.2	16.5	31.9
2001	P. Cod	ALL	ALL	287	10,705	39,837	50,829	34,583	26,205	36,023	70,708	171,992	0.2	6.2	23.2	29.6	20.1	15.2	20.9	41.1
2001	Atka mackerel	Trawl	1	161	2,368	10,298	12,827	2	12,572	5,260	13,083	28,262	0.6	8.4	36.4	45.4	0.0	44.5	18.6	46.3
2001	Atka mackerel	Trawl	2	120	415	1,080	1,616	28	1,279	1,401	1,616	3,013	4.0	13.8	35.9	53.6	0.9	42.4	46.5	53.6
2001	Atka mackerel	Trawl	3	4	1,292	10,474	11,771	293	9,144	7,789	11,771	28,496	0.0	4.5	36.8	41.3	1.0	32.1	27.3	41.3
2001	Atka mackerel	Trawl	4	0	0	459	459	6	423	283	459	1,418	0.0	0.0	32.4	32.4	0.4	29.8	19.9	32.4
2001	Atka mackerel	Trawl	ALL	286	4,075	22,312	26,672	329	23,418	14,732	26,929	61,189	0.5	6.7	36.5	43.6	0.5	38.3	24.1	44.0
2001	Atka mackerel	Pot	1	0	1	1	2	1	1	2	2	2	0.0	48.3	47.6	95.9	51.3	60.0	86.1	95.9
2001	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	0.0	47.1	52.9	100.0	100.0	100.0	100.0	100.0
2001	Atka mackerel	Pot	3	0	3	4	8	8	8	7	8	8	0.0	43.9	56.0	99.9	99.4	99.5	89.9	99.9
2001	Atka mackerel	Pot	4	0	1	3	5	5	4	4	5	5	0.0	26.5	73.5	100.0	100.0	83.8	98.9	100.0
2001	Atka mackerel	Pot	ALL	0	6	9	14	13	13	13	14	14	0.0	39.0	60.4	99.4	93.0	89.2	92.3	99.4
2001	Atka mackerel	Longline	1	0	48	21	69	2	65	16	69	70	0.1	69.5	30.1	99.7	2.2	93.5	22.3	99.4
2001	Atka mackerel	Longline	2	0	0	0	0	0	0	0	0	1	0.0	9.0	26.3	35.2	0.3	6.4	26.3	32.4
2001	Atka mackerel	Longline	3	0	118	29	147	7	134	72	147	164	0.0	71.5	17.9	89.4	4.3	81.5	43.7	89.4
2001	Atka mackerel	Longline	4	0	21	14	35	0	28	21	35	38	0.6	54.7	36.0	91.3	0.4	74.4	54.2	91.4
2001	Atka mackerel	Longline	ALL	0	187	64	252	9	227	108	252	273	0.1	68.3	23.6	92.0	3.2	83.2	39.6	92.2
2001	Atka mackerel	ALL	ALL	286	4,268	22,385	26,939	351	23,658	14,854	27,195	61,477	0.5	6.9	36.4	43.8	0.6	38.5	24.2	44.2
2002	Pollock	Trawl	1	106	1,799	71,715	73,619	29,135	37,202	66,337	305,614	594,112	0.0	0.3	12.1	12.4	4.9	6.3	11.2	51.4
2002	Pollock	Trawl	2	0	848	12,542	13,391	10,766	8,346	19,111	16,712	71,952	0.0	1.2	17.4	18.6	15.0	11.6	26.6	23.2

Year	Fishery	Gear	Quarter	BSAI Catch Amounts in mt expanded from the Blend estimates 0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	BSAI Catch Amounts in PERCENT expanded from the Blend estimates 0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
2002	Pollock	Trawl	3	0	6,919	122,836	129,755	73,422	50,959	124,381	359,200	743,382	0.0	0.9	16.5	17.5	9.9	6.9	16.7	48.3
2002	Pollock	Trawl	4	0	1,507	15,141	16,648	12,144	7,553	19,697	55,984	66,336	0.0	2.3	22.8	25.1	18.3	11.4	29.7	84.4
2002	Pollock	Trawl	ALL	106	11,073	222,234	233,412	125,467	104,060	229,527	737,509	1,475,783	0.0	0.8	15.1	15.8	8.5	7.1	15.6	50.0
2002	Pollock	Pot	1	0	6	7	13	4	4	8	13	22	0.0	28.0	30.2	58.2	16.9	19.4	36.3	60.4
2002	Pollock	Pot	2	0	0	0	0	0	0	0	0	0	0.0	0.0	100.0	100.0	71.3	100.0	171.3	100.0
2002	Pollock	Pot	3	0	1	0	2	2	2	3	2	6	0.0	22.9	5.8	28.8	27.1	27.1	54.2	32.3
2002	Pollock	Pot	4	0	0	0	0	0	0	1	0	1	0.0	27.4	8.5	35.9	33.6	35.9	69.5	35.9
2002	Pollock	Pot	ALL	0	8	7	15	6	6	12	15	28	0.0	26.9	24.7	51.7	19.5	21.5	41.0	54.1
2002	Pollock	Longline	1	0	27	198	225	115	161	236	426	2,618	0.0	1.0	7.6	8.6	4.4	6.1	9.0	16.3
2002	Pollock	Longline	2	0	0	5	6	6	5	7	13	86	0.4	0.4	6.3	7.1	7.0	6.0	8.0	15.1
2002	Pollock	Longline	3	0	8	25	34	2	32	99	137	1,894	0.0	0.4	1.3	1.8	0.1	1.7	5.2	7.2
2002	Pollock	Longline	4	0	25	115	140	23	85	199	283	1,887	0.0	1.3	6.1	7.4	1.2	4.5	10.5	15.0
2002	Pollock	Longline	ALL	0	60	343	404	146	283	541	859	6,486	0.0	0.9	5.3	6.2	2.3	4.4	8.3	13.2
2002	Pollock	ALL	ALL	106	11,141	222,584	233,831	125,619	104,349	230,079	738,383	1,482,297	0.0	0.8	15.0	15.8	8.5	7.0	15.5	49.8
2002	P. Cod	Trawl	1	7	3,619	24,941	28,568	7,334	19,642	17,098	37,613	53,652	0.0	6.7	46.5	53.2	13.7	36.6	31.9	70.1
2002	P. Cod	Trawl	2	14	150	2,837	3,001	596	591	6,847	7,321	11,780	0.1	1.3	24.1	25.5	5.1	5.0	58.1	62.1
2002	P. Cod	Trawl	3	0	101	1,646	1,747	783	642	3,724	4,208	10,531	0.0	1.0	15.6	16.6	7.4	6.1	35.4	40.0
2002	P. Cod	Trawl	4	0	0	309	309	175	49	1,295	1,306	2,396	0.0	0.0	12.9	12.9	7.3	2.0	54.0	54.5
2002	P. Cod	Trawl	ALL	22	3,871	29,732	33,625	8,889	20,924	28,964	50,448	78,359	0.0	4.9	37.9	42.9	11.3	26.7	37.0	64.4
2002	P. Cod	Pot	1	0	3,978	3,346	7,325	3,350	3,629	7,106	7,704	9,909	0.0	40.1	33.8	73.9	33.8	36.6	71.7	77.7
2002	P. Cod	Pot	2	0	0	0	0	0	0	0	0	0	0.0	1.1	98.9	100.0	73.0	100.0	100.0	100.0
2002	P. Cod	Pot	3	0	1,102	155	1,257	1,053	1,049	1,388	1,398	3,062	0.0	36.0	5.1	41.0	34.4	34.3	45.3	45.7
2002	P. Cod	Pot	4	0	491	361	852	832	845	833	852	1,775	0.0	27.6	20.4	48.0	46.9	47.6	46.9	48.0
2002	P. Cod	Pot	ALL	0	5,570	3,863	9,433	5,236	5,523	9,328	9,955	14,746	0.0	37.8	26.2	64.0	35.5	37.5	63.3	67.5
2002	P. Cod	Longline	1	0	880	4,891	5,772	2,769	4,159	4,932	9,892	50,134	0.0	1.8	9.8	11.5	5.5	8.3	9.8	19.7
2002	P. Cod	Longline	2	0	47	107	154	113	113	125	279	2,937	0.0	1.6	3.6	5.2	3.8	3.9	4.3	9.5
2002	P. Cod	Longline	3	12	409	714	1,135	397	914	1,765	2,926	24,362	0.0	1.7	2.9	4.7	1.6	3.8	7.2	12.0
2002	P. Cod	Longline	4	1	384	1,872	2,256	642	1,399	3,474	4,667	25,173	0.0	1.5	7.4	9.0	2.5	5.6	13.8	18.5
2002	P. Cod	Longline	ALL	13	1,720	7,584	9,317	3,921	6,586	10,297	17,764	102,605	0.0	1.7	7.4	9.1	3.8	6.4	10.0	17.3
2002	P. Cod	ALL	ALL	35	11,161	41,180	52,375	18,046	33,033	48,589	78,167	195,710	0.0	5.7	21.0	26.8	9.2	16.9	24.8	39.9
2002	Atka mackerel	Trawl	1	41	1,000	8,433	9,475	8,477	2,589	112	9,475	18,485	0.2	5.4	45.6	51.3	45.9	14.0	0.6	51.3
2002	Atka mackerel	Trawl	2	0	113	1,185	1,298	1,168	523	69	1,298	1,650	0.0	6.9	71.8	78.7	70.8	31.7	4.2	78.7
2002	Atka mackerel	Trawl	3	0	251	10,082	10,333	8,286	3,070	400	10,337	24,452	0.0	1.0	41.2	42.3	33.9	12.6	1.6	42.3
2002	Atka mackerel	Trawl	4	0	2	373	375	369	64	143	392	576	0.0	0.3	64.8	65.1	64.1	11.1	24.8	68.1
2002	Atka mackerel	Trawl	ALL	0	1,367	20,072	21,480	18,300	6,245	723	21,503	45,162	0.0	3.0	44.4	47.6	40.5	13.8	1.6	47.6
2002	Atka mackerel	Pot	1	0	2	3	5	5	5	5	5	5	0.0	42.2	57.8	100.0	100.0	100.0	100.0	100.0
2002	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	0.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0
2002	Atka mackerel	Pot	3	0	16	8	24	24	24	26	26	26	0.0	62.2	31.7	93.9	93.4	93.4	100.0	100.0
2002	Atka mackerel	Pot	4	0	17	4	21	21	21	21	21	21	0.0	81.9	18.1	100.0	100.0	98.9	100.0	100.0
2002	Atka mackerel	Pot	ALL	0	35	15	50	50	50	52	52	52	0.0	68.3	28.7	97.0	96.8	96.3	100.0	100.0
2002	Atka mackerel	Longline	1	0	2	2	5	3	4	0	5	5	0.0	46.6	46.2	92.8	70.2	84.4	0.0	92.8
2002	Atka mackerel	Longline	2	0	0	0	0	0	0	0	0	0	0.0	85.7	7.5	93.2	50.5	86.4	0.0	93.2
2002	Atka mackerel	Longline	3	0	19	11	31	20	20	0	31	36	0.8	53.4	29.4	83.7	53.9	53.5	0.0	83.7
2002	Atka mackerel	Longline	4	0	1	1	2	2	1	2	2	2	0.0	32.2	65.3	97.6	95.7	91.2	97.9	97.9
2002	Atka mackerel	Longline	ALL	0	23	14	37	25	25	2	37	43	0.7	52.1	32.5	85.3	57.3	58.7	3.7	85.3
2002	Atka mackerel	ALL	ALL	0	1,424	20,101	21,567	18,375	6,321	777	21,591	45,257	0.0	3.1	44.4	47.7	40.6	14.0	1.7	47.7
2002	ALL	ALL	ALL	141	23,726	283,865	307,774	162,039	143,703	279,446	838,141	1,723,264	0.0	1.4	16.5	17.9	9.4	8.3	16.2	48.6

Appendix II Table II-2

				GOA Catch Amounts in mt expanded from the Blend estimates									GOA Catch Amounts in PERCENT expanded from Blend estimates							
Year	Fishery	Gear	Quarter	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH	Total Catch	0-3	3-10	10-20	0-20	Foraging	Rookery	Haulout	Total CH
1991	Pollock	Trawl	1	781	3,882	5,187	9,850	4,070	3,071	8,685	11,058	14,495	5.4	26.8	35.8	68.0	28.1	21.2	59.9	76.3
1991	Pollock	Trawl	2	19	2,007	2,901	4,928	10	405	4,877	4,924	8,832	0.2	22.7	32.9	55.8	0.1	4.6	55.2	55.8
1991	Pollock	Trawl	3	1,746	3,644	8,276	13,666	393	2,591	8,615	13,515	28,705	6.1	12.7	28.8	47.6	1.4	9.0	30.0	47.1
1991	Pollock	Trawl	4	45	3,980	9,776	13,801	1	744	12,276	13,747	27,756	0.2	14.3	35.2	49.7	0.0	2.7	44.2	49.5
1991	Pollock	Trawl	ALL	2,591	13,512	26,140	42,244	4,474	6,811	34,453	43,244	79,788	3.2	16.9	32.8	52.9	5.6	8.5	43.2	54.2
1991	Pollock	Pot	1	2	18	42	62	56	1	61	64	64	3.0	27.5	65.0	95.5	87.1	1.5	95.4	100.0
1991	Pollock	Pot	2	3	1	0	4	3	0	4	4	4	66.9	21.3	11.8	100.0	81.1	4.3	98.6	100.0
1991	Pollock	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Pollock	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Pollock	Pot	ALL	5	19	42	66	59	1	66	69	69	6.9	27.2	61.8	95.8	86.7	1.7	95.6	100.0
1991	Pollock	Longline	1	0	6	8	14	0	13	7	14	15	0.4	37.0	54.1	91.5	0.0	88.2	48.2	91.5
1991	Pollock	Longline	2	0	0	0	0	0	0	0	0	3	0.0	0.0	14.7	14.7	0.0	0.0	14.7	14.7
1991	Pollock	Longline	3	0	0	1	1	0	0	1	1	1	0.0	0.0	84.0	84.0	0.0	0.0	84.0	84.0
1991	Pollock	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Pollock	Longline	ALL	0	6	10	15	0	13	9	15	19	0.3	29.6	50.8	80.8	0.0	70.6	46.1	80.8
1991	Pollock	ALL	ALL	2,596	13,537	26,192	42,325	4,533	6,825	34,527	43,328	79,875	3.3	16.9	32.8	53.0	5.7	8.5	43.2	54.2
1991	P. Cod	Trawl	1	1,711	13,417	26,200	41,328	535	26,101	30,339	41,419	51,752	3.3	25.9	50.6	79.9	1.0	50.4	58.6	80.0
1991	P. Cod	Trawl	2	0	354	1,108	1,463	305	790	640	1,463	2,836	0.0	12.5	39.1	51.6	10.8	27.9	22.6	51.6
1991	P. Cod	Trawl	3	0	104	471	575	0	145	372	576	1,818	0.0	5.7	25.9	31.6	0.0	8.0	20.5	31.7
1991	P. Cod	Trawl	4	8	10	682	700	133	536	136	829	1,686	0.5	0.6	40.5	41.5	7.9	31.8	8.0	49.2
1991	P. Cod	Trawl	ALL	1,719	13,885	28,461	44,066	973	27,573	31,486	44,286	58,093	3.0	23.9	49.0	75.9	1.7	47.5	54.2	76.2
1991	P. Cod	Pot	1	332	1,416	2,775	4,523	2,772	1,154	4,036	5,358	5,620	5.9	25.2	49.4	80.5	49.3	20.5	71.8	95.3
1991	P. Cod	Pot	2	565	1,023	992	2,580	1,529	492	2,328	2,578	3,413	16.6	30.0	29.1	75.6	44.8	14.4	68.2	75.5
1991	P. Cod	Pot	3	0	33	4	36	0	33	33	80	80	0.0	41.1	4.7	45.7	0.0	41.1	41.1	100.0
1991	P. Cod	Pot	4	0	344	918	1,262	0	342	1,005	1,262	1,351	0.0	25.5	67.9	93.4	0.0	25.3	74.4	93.4
1991	P. Cod	Pot	ALL	897	2,816	4,688	8,401	4,301	2,021	7,402	9,277	10,464	8.6	26.9	44.8	80.3	41.1	19.3	70.7	88.7
1991	P. Cod	Longline	1	40	798	3,849	4,711	0	4,464	801	4,691	7,051	0.6	11.3	54.6	66.8	0.0	63.3	11.4	66.5
1991	P. Cod	Longline	2	0	6	51	57	16	0	57	64	295	0.0	2.2	17.1	19.3	5.5	0.0	19.3	21.6
1991	P. Cod	Longline	3	89	0	97	186	0	94	186	186	310	28.6	0.0	31.3	59.8	0.0	30.5	59.8	59.8
1991	P. Cod	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	P. Cod	Longline	ALL	129	805	3,996	4,954	16	4,558	1,044	4,940	7,656	1.7	10.5	52.2	64.7	0.2	59.5	13.6	64.5
1991	P. Cod	ALL	ALL	2,745	17,506	37,146	57,421	5,291	34,152	39,932	58,503	76,213	3.6	23.0	48.7	75.3	6.9	44.8	52.4	76.8
1991	Atka mackerel	Trawl	1	0	95	12	107	0	107	101	108	113	0.4	83.6	10.9	94.9	0.0	94.6	89.6	95.0
1991	Atka mackerel	Trawl	2	0	0	0	0	0	0	0	0	0	0.0	31.3	0.0	31.3	0.0	0.0	0.0	31.3
1991	Atka mackerel	Trawl	3	0	0	60	60	0	60	0	60	64	0.0	0.0	93.8	93.8	0.0	93.6	0.2	93.8
1991	Atka mackerel	Trawl	4	0	10	1,042	1,052	0	1,052	0	1,052	1,052	0.0	1.0	99.0	99.9	0.0	99.9	0.0	99.9
1991	Atka mackerel	Trawl	ALL	0	105	1,114	1,219	0	1,218	101	1,219	1,229	0.0	8.5	90.6	99.2	0.0	99.1	8.3	99.2
1991	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	0.0	10.1	54.5	64.6	0.0	10.1	49.6	0.0
1991	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Pot	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Pot	ALL	0	0	0	0	0	0	0	0	0	0.0	7.8	41.9	49.7	0.0	7.8	38.2	72.8
1991	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Longline	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Longline	3	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	Longline	ALL	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	Atka mackerel	ALL	ALL	0	105	1,114	1,219	0	1,218	101	1,219	1,229	0.0	8.5	90.6	99.2	0.0	99.1	8.3	99.2
1991	ALL	ALL	ALL	5,342	31,147	64,452	100,965	9,824	42,196	74,561	103,050	157,317	3.4	19.8	41.0	64.2	6.2	26.8	47.4	65.5
1992	Pollock	Trawl	1	1,462	8,158	8,496	18,116	14,259	1,822	16,199	19,289	34,023	4.3	24.0	25.0	53.2	41.9	5.4	47.6	56.7
1992	Pollock	Trawl	2	546	2,171	18,247	20,964	1,748	3,180	18,828	22,480	26,435	2.1	8.2	69.0	79.3	6.6	12.0	71.2	85.0
1992	Pollock	Trawl	3	30	1,484	11,139	12,653	3,407	704	12,653	15,400	19,622	0.2	7.6	56.8	64.5	17.4	3.6	64.5	78.5

Appendix III

This is a comparison of "traditional" fishing areas in 1991 and 1998 to the closure zones implemented in 2002 to determine the amount of traditional catch that would be forgone under the Steller sea lion conservation measures. Amounts described are catch in 1991 or 1998 that would now be forgone because of a closure area under the 2002 Steller sea lion conservation measures.

P.Cod		0-3			3-10			10-20			0-20			Foraging Areas		
Area	Gear	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999
GOA	Longline	129	16	16	6	90	1,314	0	1,112	30	135	1,217	1,359	6	0	-
GOA	Pot	655	221	92	1,419	1,605	2,498	1,919	1,488	1,132	3,993	3,315	3,722	680	0	53
GOA	Trawl	1,648	130	190	7,485	2,997	1,812	18,092	4,702	381	27,225	7,829	2,383	0	150	102
EBS	Longline	161	275	8	46	60	102	693	651	686	900	986	796	1,463	900	1,527
EBS	Pot	128	200	110	10	45	95	57	110	229	195	355	434	223	381	605
EBS	Trawl	81	0	47	6,298	0	1,219	1,716	0	20	8,095	0	1,286	8,649	0	1,286
AI	Longline	114	475	161	333	4,572	3,330	116	334	901	563	5,381	4,392	139	1,041	1,287
AI	Pot	240	0	197	355	312	896	0	8	5	595	320	1,098	0	38	46
AI	Trawl	39	286	131	708	708	-	140	219	147	887	1,213	277	782	849	147
TOTAL		3,195	1,603	850	16,660	10,389	11,266	22,733	8,624	3,531	42,588	20,616	15,746	11,944	3,359	5,053

P.Cod		Rookery			Haulout			CH Total Displaced			Total Displaced			Total Catch			Percent CH displaced		
Area	Gear	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999
GOA	Longline	124	279	950	135	816	1,196	135	1,217	1,359	149	1,217	1,359	7,451	9,643	31,956	2	13	4
GOA	Pot	909	2,173	2,784	3,447	3,127	3,387	4,024	3,315	3,722	4,038	3,315	3,722	10,464	10,523	19,015	39	31	20
GOA	Trawl	24,633	4,423	925	16,513	5,287	2,165	27,187	7,780	2,383	27,256	7,829	2,383	51,994	36,073	12,275	52	22	19
EBS	Longline	180	323	45	651	594	517	1,463	1,362	1,645	1,463	1,362	1,645	76,519	82,532	81,396	2	2	2
EBS	Pot	106	43	38	124	69	167	228	385	605	228	385	617	3,336	12,846	12,399	7	3	5
EBS	Trawl	5,112	0	6	6,058	0	25	8,815	0	1,286	8,815	0	1,286	81,297	30,721	28,758	11	0	4
AI	Longline	424	5,334	4,231	298	3,531	3,476	574	5,831	4,392	574	5,831	277	2,486	12,857	7,859	23	45	4
AI	Pot	443	320	1,043	162	320	362	228	320	1,098	595	320	1,098	1,178	406	3,750	51	79	29
AI	Trawl	887	897		887	1,205	277	887	1,213	277	887	1,213	4,392	2,492	15,722	13,901	36	8	32
TOTAL		32,818	13,793	10,022	28,276	14,949	11,574	43,541	21,423	16,767	44,005	21,472	16,779	237,216	211,324	211,307	19	10	8

Pollock		0-3			3-10			10-20			0-20			Foraging Areas		
Area	Gear	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999
GOA	Trawl	3,976	26,950	1,763	7,645	24,699	2,431	14,927	13,297	4,764	26,549	64,946	8,959	1,654	1,845	193
EBS	Trawl	426	341	-	47,045	2,918	721	162,547	1,105	4,045	210,018	4,364	4,766	341,481	5,522	6,440
AI	Trawl	0	0	23	3,275	84	125	48,225	11	14	51,500	95	162	1,398	80	-
TOTAL		4,402	27,291	1,786	57,965	27,701	3,277	225,700	14,413	8,823	288,067	69,405	13,887	344,533	7,447	6,633

Pollock		Rookery			Haulout			CH Total Displaced			Total Displaced			Total Catch			Percent CH displaced		
Area	Gear	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999
GOA	Trawl	11,555	6,386	2,353	13,484	50,450	8,389	26,546	63,075	8,959	35,371	65,058	9,314	94,074	124,281	94,446	38	52	10
EBS	Trawl	129,618	1,939	746	159,918	1,751	541	342,224	5,523	6,440	342,839	7,104	13,583	1,232,813	1,077,970	965,931	28	1	1
AI	Trawl	1,415	82	157	51,492	95	152	51,290	95	162	72,205	105	172	97,745	23,339	172	74	0	100
TOTAL		142,588	8,407	3,256	224,894	52,295	9,082	420,060	68,694	15,561	450,415	72,268	23,069	1,424,632	1,225,589	1,060,549	32	6	2

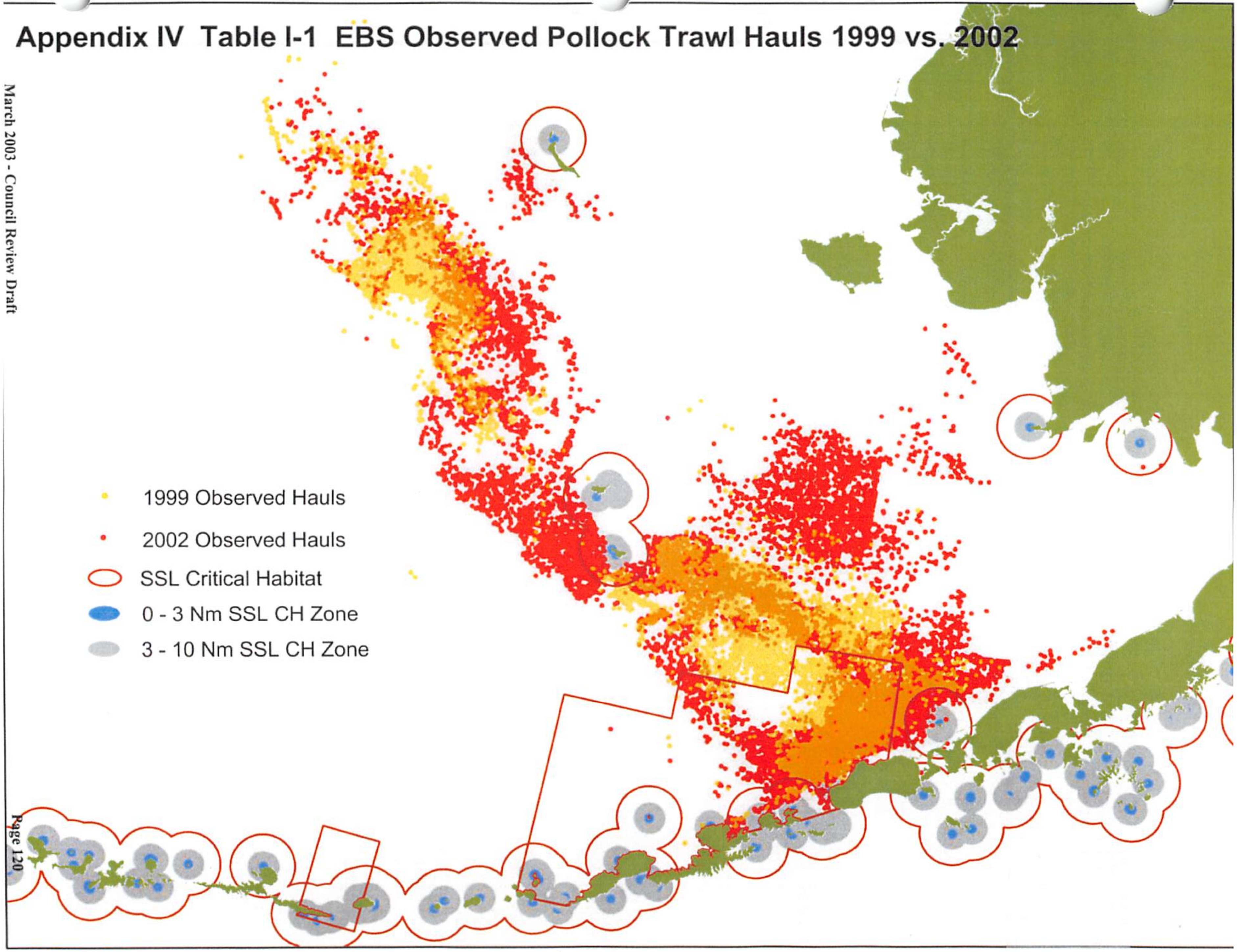
Atka Mackerel		0-3			3-10			10-20			0-20			Foraging Areas		
Area	Gear	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999
EBS	Trawl	0	0	-	918	102	-	1,218	454	1,944	2,136	556	1,944	2,136	592	1,944
AI	Trawl	272	65	280	18,030	342	568	902	7,828	8,656	19,204	8,235	9,505	13,165	188	6
TOTAL		272	65	280	18,948	444	568	2,120	8,282	10,600	21,340	8,791	11,449	15,301	780	1,950

Atka Mackerel		Rookery			Haulout			CH Total Displaced			Total Displaced			Total Catch			Percent CH displaced		
Area	Gear	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999	1991	1998	1999
EBS	Trawl	2,043	556	1,944	1,916	427	1,852	2,136	592	1,944	2,136	592	1,944	2,140	592	1,944	100	100	100
AI	Trawl	19,093	2,706	5,297	19,149	5,927	4,588	19,206	575	9,505	19,206	575	9,505	21,577	54,896	53,114	89	1	18
TOTAL		21,136	3,262	7,241	21,065	6,354	6,439	21,342	1,167	11,449	21,342	1,167	11,449	23,717	55,488	55,058	90	2	21

These values represent estimates of the amount of catch (mT) displaced by area closures implemented in the 2002 Steller Sea Lion Protection Measures EIR. The **observed** fishing distribution for 1991 and 1998 was overlaid with 2002 area closures in a GIS to estimate the amount of fishing that occurred in these areas under previous management regimes. These values were estimated by applying an adjustment factor to the observed catch in order to expand the observed catch to the total catch. Estimates of displaced catch are based on area closures only. No attempt was made to account for changes resulting from protection measures such as seasons, approtionments, critical habitat harvest limits, or platoons. The following temporal measures were accounted for:

- EBS A season pollock closure in the Bering Sea pollock restriction area
- EBS B season pollock closure in the CVOA for trawl catcher processors
- The Chiniak Gully Research Area which is closed to trawling from August 1 - September 20
- GOA area closures for directed Pollock and P. Cod fishing that vary from the first and second half of the year.

Appendix IV Table I-1 EBS Observed Pollock Trawl Hauls 1999 vs. 2002



Appendix IV Table I-2 GOA Observed Pollock Trawl Hauls 1999 vs. 2002