SUPPLEMENT 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

Issued: 19 June 2003

Approved by: ____________________

ABSTRACT

The National Marine Fisheries Service (NOAA Fisheries) has prepared a supplement 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). NOAA Fisheries 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 supplement is a focused response to issues outlined by the Court and the memorandum by Dr. James Balsiger.

Section I provides an introduction to the document, an update on the current status of the Steller sea lion, and a summary of the Steller sea lion conservation measures implemented by NOAA Fisheries (i.e., description of the action).

Section II explores the available satellite telemetry data and how that scientific information was interpreted by NOAA Fisheries with relation to the foraging needs of Steller sea lions. In this section we review the published literature for satellite telemetry and provide further unpublished data on the locations of juvenile Steller sea lions less than two years of age. The data suggests that the areas of highest use are within 0-10 nm of rookeries and haulouts. However, both older juveniles and adult females may utilize the 10-20 nm zone of critical habitat to a greater extent in the winter. NOAA Fisheries concluded (based on the satellite telemetry data) that the 0-10 nm zone was of "high" concern from potential overlap with fisheries, the 10-20 nm zone was "low to moderate", and beyond 20 nm was of "low" concern.

Section III explores the changes to the spatial and temporal distribution of the fishery between 1999 to 2002 and the possible effects of groundfish fisheries on the prey field for sea lions. The expectation was that the conservation measures would restrict harvest amounts in the 0-10 nm zone, less so in the 10-20 nm zone, and would distribute the fishery throughout the year to minimize potential for localized depletions of prey. Results were mixed with closures generally effective inside the 0-10 nm zone, and less so further offshore with catch in some cases increasing in critical habitat overall. NOAA Fisheries also explored the effects of fisheries on the amount of prey remaining and available to Steller sea lions inside critical habitat. Here again results were mixed, with catch rates generally low in the winter and in the 0-10 nm zone, while higher in the summer/fall and in the 10-20 nm zone.

Section IV describes the expected effects of the action on Steller sea lions and how the action avoids jeopardy and adverse modification of critical habitat. The evidence available for this assessment was limited to the timing and location of fisheries removals, expected effects on the prey field for Steller sea lions inside critical habitat, and the foraging characteristics of Steller sea lions. Based on published and unpublished studies, prey depletions associated with fishery removals may result in decreased foraging success for Steller sea lions. Any behavioral response causing adverse effects to individuals, feeding, or reproduction and increased susceptibility to predation may result in negative impacts to the population. Of particular concern may be the disruption of foraging trips by juvenile Steller sea lions (ages 2-4) and lactating females. Until more conclusive results on the effects of fisheries on these age classes of the population, NOAA Fisheries believes that precautionary measures to prevent harm to Steller sea lions should be taken to reduce the likelihood of any adverse effects to individuals or populations. NOAA Fisheries concludes that the action is not likely to jeopardize Steller sea lions or adversely modify its critical habitat.

TABLE OF CONTENTS

I. Introduction

This document is a supplement to the 2001 BiOp on the pollock, Pacific cod, and Atka mackerel fisheries off Alaska in response to a remand order by the Court. NOAA Fisheries 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 supplement 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 NOAA Fisheries continually, and will be responded to in future consultations as appropriate. This focused approach is discussed further below.

A. Purpose of this supplement

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 NOAA Fisheries 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 NOAA Fisheries and stated 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 NOAA Fisheries 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 NOAA Fisheries 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 NOAA Fisheries failed to articulate a rational connection between the facts found and the choice made for this item in the biological opinion.

NOAA Fisheries is therefore revisiting its analysis, its rational, and its underlying basis in these areas and is re-rendering its determination based upon this new analysis.

B. Issues that will be considered in this supplement

This remand response document addresses the following issues noted on pages 27 and 30-32 of the December 18 Order which formed the basis for the remand (described in the memo from Dr. 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. Comments on the draft supplement

NOAA Fisheries requested comments on the draft supplement from March 31, 2003 through April 18. NOAA Fisheries received six comments which are found in the administrative record. Those comments were considered in this final supplement and incorporated where they were appropriate. In general, comments were constructive and provided additional information about specific fishery issues.

D. Current status of the species

Since the 2001 BiOp, NOAA Fisheries 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 an increase, the first increase seen in the population since the decline began in the late 1970s. Although this is certainly a positive event, it must be considered with caution. This is discussed further below.

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 (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 an estimated 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 estimated to be 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 (NOAA Fisheries 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).

E. Summary of Steller sea lion conservation measures

This alternative was developed by the Council's Reasonable and Prudent Alternative (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 Figure I-4. 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:

<u>Applicable to all fisheries</u>:

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

<u>Applicable to all pollock, cod, and mackerel fisheries</u>:

- 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 female spawning 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.

<u>Applicable to AI pollock fisheries</u>:

- 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%).

<u>Applicable to BSAI cod fisheries</u>:

- 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:

  <u>In the Aleutian Islands</u>

  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 NOAA Fisheries 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 Sea Lion Conservation Area (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)

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

- 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.

F. Closed areas under the proposed action and the RPA from the FMP BiOp

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 (for closure areas) by looking at each individual fishery and area to determine what is actually closed and open inside Steller sea lion critical habitat. We'll examine the combined effects in sections III and IV.

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-5 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. The amount of area that would have been closed under the FMP BiOp is displayed in Table I-12. Gear types are not listed separately because the closure areas are identical for all gear types. Overall, 63% of critical habitat was closed, but only 65% of the 0-10 nm area was closed. One important difference in the closure areas was that under the FMP BiOp any area that was closed was closed to all three species which would insure no competition for any of the three, whereas under the 2001 conservation measures this is not the case. An area closed to pollock fishing may be open to Pacific cod fishing, or Atka mackerel. Thus, closure areas are not exactly equal.

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 NOAA Fisheries.

A. Overview of telemetry information

There have been numerous publications describing foraging behavior and ontogeny of Steller sea lions using telemetry. NOAA Fisheries has reviewed these in both the FMP BiOp and the 2001 BiOp (pages 136-139). NOAA Fisheries 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 satellite telemetry data available to NOAA Fisheries.

Table II-1 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 Holmes and York (in press) indicates a drop in fecundity and juvenile survivorship from 1993-1998. In summary they state:

> "We found that the severe declines in the early 1980s were associated with severely low juvenile survivorship, declines in the late 1980s with low adult survival, while declines in the 1990s were associated with disproportionately low fecundity."

Nutritional stress is one possible cause for lower fecundity rates, but is not the only possible cause. Predation is not a likely cause as the scientific basis for the lower fecundity rates are based on pup counts on rookeries before the pups take to the water, and therefore are not yet subject to predation by killer whales. However, there is no positive scientific link in this paper between the lower fecundity rates and nutritional stress.

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, Symposium 2003). 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. NOAA Fisheries 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 Holmes and York (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-2). 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-3 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-2).

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.

B. Background on the use of telemetry data in biological opinions

In previous biological opinions, NOAA Fisheries has used telemetry data as a tool to define important Steller sea lion foraging areas; and then has used that information to minimize the spatial and temporal overlap with commercial fisheries. Below is a brief description of the type of data used, and the evolution in the analyses over the past few years. Given the huge influx of Federal funding for research on Steller sea lion foraging behavior; the type of telemetry instrumentation, amount of data, and ability to analyze that data is changing almost daily such that NOAA Fisheries has been required to repeatedly re-evaluate its methods in these documents.

Telemetry data used in the FMP BiOp

In the FMP BiOp (their Table 4.3, presented here as Table II-4) 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). NOAA Fisheries concluded from this information that sea lions relied heavily on critical habitat and the foraging areas for survival. At that point, NOAA Fisheries determined that the smallest scale appropriate for splitting up the telemetry data was all of critical habitat (e.g., 0-20 nm plus the foraging areas).

Telemetry data used in the 2001 BiOp - and the "filtered database"

For the 2001 BiOp NOAA Fisheries utilized a variety of new telemetry information in order to determine whether the action was likely to adversely affect Steller sea lions or their critical habitat. That information is presented in section 5.2 of that document on pages 134-145. For that opinion, NOAA Fisheries 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). NOAA Fisheries was able to compare complex management measures with Steller sea lion foraging habitat by zones, or distances from land within critical habitat in a way which hadn't been possible just a year before during the preparation of the FMP BiOp.

As discussed in the Council's RPA committee reports (see http://www.fakr.noaa.gov/npfmc/Committees/ssl/ssl.htm), and described in the 2001 BiOp (page 137), NOAA Fisheries was concerned about a potential nearshore bias in the raw data set. Several important caveats with the database were noted in the 2001 BiOp:

1. Due to a larger proportion of time spent at the surface when animals are nearshore, there is a higher probability of obtaining at-sea locations near haulouts and rookeries than when animals are farther at-sea and are likely to be diving to greater depths;

2. At-sea locations only describe where an animal was at a given time, it does not necessarily indicate whether the animal was foraging;

3. The large majority of pups instrumented, and perhaps most juveniles, were likely to still be nursing, and thus not were not foraging independently from their mom; and

4. Telemetry data are lacking for subadults and females without pups.

Of these, numbers 1-3 relate most directly to a potential nearshore bias that NOAA Fisheries was concerned with. In an attempt to further understand how that bias might affect the relative weighting of critical habitat areas, NOAA Fisheries prepared an additional analysis referred to as the "filtered data set" (FMP BiOp, their Table 5.1b). In this analysis, NOAA Fisheries removed 90% of the locations which occurred between 0 and 2 nm from shore. The 90% value was offered as a proxy by sea lion biologists on the RPA committee, unfortunately no scientific data was available to make any more precise estimates of what the actual value might be.

The 90-percent filter used in the 2001 BiOp was adopted by NOAA Fisheries as a precautionary method to minimize the possibility that we would overestimate the dependence of juveniles and adult females on the inner 10 nm of critical habitat. The 90% value chosen was far from arbitrary. In fact, the higher the number of observations excluded from the 0-2 nm area (i.e., higher the filter percentage), the lower the chance that the nearshore zones would falsely be determined to be of high dependence. Eliminating all locations in the 0-2 nm zone would have the effect of completely eliminating any chance that the area's importance for foraging was overestimated. As such, a large number of observations were specified to be excluded to achieve a low probability of overestimating forage dependence in the zone.

In essence, the argument presented for dismissing hits in the 0-2 nm area was that sea lions might be passing through this zone to more offshore areas and might not be foraging, and that they might be milling around for various gregarious social activities. Therefore, they would be more frequently sighted at the surface and the probability of having a location transmitted would increase. While further out at sea, it was thought that sea lions would be either transiting or diving, in which cases they would be less likely to transmit a location. For example, for the summer data, the 90% filter deleted about 5,521 observations out of 9,131 total observations from all areas and all population segments (ADF&G and NMFS 2001); which equates to 60% of total observations in this season.

Analysis of juvenile foraging behavior to replace the "filtered database"

For this supplement, NOAA Fisheries has developed a new telemetry analysis integrating dive depth with locations which NOAA Fisheries has determined is more responsive to the questions raised above regarding some of the bias in the telemetry data. The new dive-related telemetry data identifies more specifically the mechanism that sea lions use to forage (i.e., diving). Thus, if we make the assumption that dives below a certain depth are indicative of foraging activity (foraging success or failure is unknown) then we have a tool to then remove locations from the database which aren't associated with diving, and presumably represent some other activity (e.g., resting or social behavior) and might not reflect important foraging habitat locations. This is the most scientifically robust method that NOAA Fisheries has available at the current time to discriminate between possible foraging behavior and other activities which might bias the telemetry data (when using that data to analyze important foraging habitat and usage). This analysis is described in detail below in section II(C). Although this analysis is far superior to the 90% filter method of the 2001 BiOp, certain biases still exist in the data, such as the age of the animals instrumented, the time of year, the longevity of the transmitters, and their limited data storage and transmittal abilities. These issues are the subject of continued research, which is expected to provide further insight over the next 5-10 years with continued research programs and advancement in technology pending continued support by Congress.

Revised zones of importance to sea lions

Previously NOAA Fisheries 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. For this supplement, NOAA Fisheries is modifying this approach by combining these two zones (see Table II-5). In the 2001 BiOp, NOAA Fisheries rated both the 0-3 nm zone and the 3-10 nm zone as a "high" concern based on the use by Steller sea lions and the potential for the area to act as a buffer against any fishing effects on the prey field for sea lions. NOAA Fisheries' rationale for combining these zones is twofold: first, the accuracy of the telemetry data is really insufficient to use such a small area as the 0-3 nm zone which reflects only a fraction of the total area of the 3-10 nm zone; and second, the use of the 0-10 nm area is higher closer to shore and then trails off the farther from shore (i.e., there is no natural break at 3 nm)(2001 BiOp; see ADF&G and NMFS white paper on telemetry).

The accuracy of the telemetry data is discussed further below (section II(C)). Positions that pass the test for "accuracy" can be up to a kilometer or more from the actual location which calls into question using an area as small as 0-3 nm, continuing the use of such small zones would imply an accuracy in the data which does not exist at the current time.

In an analysis provided by Karl Haflinger (see Sea State, May 13, 2002), the telemetry data was binned in 0-3 and 3-10 in order to determine how the 0-10 nm zone was being used by sea lions. It further supports NOAA Fisheries' approach where most of the locations were within 10 nm with the number of locations trailing off out to 10 nm with a natural break appearing to be at 10 nm.

C. Juvenile foraging behavior

In an effort to better understand the characteristics of juvenile foraging behavior, NMML scientists prepared a series of analyses in January and February of 2003 using the most recent telemetry data. These analyses were based on juvenile dive locations derived from satellite transmitters during the three-year period from 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 which was not available for the 2001 BiOp. The supplemental information contains the locations recorded during periods for which dive data were received with 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 purpose for this additional analysis was to present only those locations associated with dive data (presumably foraging behavior) and therefore improve on the analysis presented in the 2001 BiOp using the "filtered database" (their Table 5.1b).

Methods

The transmitters that NOAA Fisheries 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 instrument detects that the saltwater switch, and hence the antenna, is out of the water), while 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, NOAA Fisheries 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, juvenile 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. Use inside the 0-10 nm zone is greatest near shore, and trails off quickly as distance increases (Figure II-7). 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 pups and juvenile sea lions from 1990-2000. In many ways this new analysis on juveniles is more focused on their foraging behavior as it removes locations from the database that are not associated with dives to more than 4 m (presumably foraging). In summary, we can conclude that there remains some dependence on the 10-20 nm zone, though not to the level as in the 0-10 nm zone; which was also the conclusion in the 2001 BiOp.

Knowing that some of the sea lion locations presented in Table II-6, are from pups older than 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 (using the dive filtered and age filtered database):

	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 rookery or haulout sites (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 NOAA Fisheries 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 table is provided because it represents the most important subset of the sea lion population that NOAA Fisheries 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; Figure II-7; see Haflinger, 2003). 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 et. al., 2003 Symposium.).

Given the relatively 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), NOAA Fisheries 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, NOAA Fisheries 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, NOAA Fisheries 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, NOAA Fisheries 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. NOAA Fisheries 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 (NOAA Fisheries 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. NOAA Fisheries then needed to explore the critical question of how much overlap occurred. Therefore, NOAA Fisheries examined the extent to which Steller sea lions rely on the various species of prey in their diet. Next, NOAA Fisheries investigated whether those important prey items were consumed coincident with the location, timing or pattern of fishery removals.

The following represents the process which NOAA Fisheries 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 NOAA Fisheries (1998) and other NOAA Fisheries 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. Since this analysis was completed, food habits data have been published in Sinclair and Zeppelin (2002).

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.

NOAA Fisheries 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, NOAA Fisheries' 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 could reasonably be changed through management actions; 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, NOAA Fisheries in turn was concerned about impacts of these fisheries on the foraging success of Steller sea lions. In the FMP BiOp, NOAA Fisheries' 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, NOAA Fisheries 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, NOAA Fisheries 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 NOAA Fisheries; it appeared from the data that animals predominately used the 0-10 nm zone. Utilizing this new information, NOAA Fisheries 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.

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, NOAA Fisheries 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." NOAA Fisheries can make predictions on where the fishery will occur, yet given the complex suite of decisions which go into choosing a location to fish, these predictions can only be general. In this case, our expectation that when the fishery was displaced from nearshore areas that it would operate primarily in areas as close to that as possible (i.e., in the 10-20 nm zone inside critical habitat). At this point, we have actual data on fishery performance under these conservation measures which allows us to accurately describe the results of the suite of conservation measures.

To answer questions about the location and timing of catch, NOAA Fisheries 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 both a level annual catch amount as well as critical habitat catch amount (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.

NOAA Fisheries 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 NOAA Fisheries 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 (Table III-4 and Figure III-3), pollock trawl harvest was virtually eliminated from the 0-3 nm zone, was down about 24% from 1999 in the 3-10 nm zone, reduced 20% in 10-20 nm, and was down overall by 34% in critical habitat. These reductions in catch correlate with what would be expected 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 NOAA Fisheries 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 (Table III-9). 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% (41,556 mt to 222,584 mt which represented 15% of the total catch in 2002) in the 10-20 nm zone in the EBS, which again was expected given the conservation strategy of closing only the 0-10 nm area, which would thereby allow harvest in the 10-20 nm zone for vessels which prefer to fish closer to shore. Overall, the catch in critical habitat (including the foraging area) was up by 49% in 2002 compared to 1999 (329,095 mt to 738,383 mt). 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 NOAA Fisheries 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 NOAA Fisheries 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.

The effects of fishing under cooperatives in the Bering Sea for pollock can be seen in Figure III-7. It includes averages of the percentage of catch by week for 1996-1998, and 2000-2002. The year 1999 is plotted separately since only half of the Bering Sea fishery was operating in cooperatives that year (catcher processors only). During the A season in the three years prior to the cooperatives under the American Fisheries Act (AFA), average removals peaked at more than 100,000 mt per week, corresponding to almost 11% of the annual TAC. In 1999, these absolute removals were lower due to the formation of offshore cooperatives, but shoreside harvesters had not yet formed cooperatives. The FMP BiOp notes at page 160:

> "In 1999, the fishery was dispersed into March (reducing the percent taken in February) and into August. Little pollock was taken in April-July. Thus, the 1999 fishery was dispersed only slightly better than the 1998 fishery (Figs. 5.1 and 5.2). In 1998, daily catch rates averaged over 8.1000 mt/day, and peaked at over 21,300 mt/day (Fig. 5.3). In 1999 and 2000, average daily catch rates for January-March declined about 22% to 6,200 mt/day and 6,400 mt/day, respectively; daily maximums were 15,400 mt/day and 12,500 mt/day, respectively. These changes resulted from a combination of the RPAs and the implementation of cooperatives under the AFA (see below)."

The entire Bering Sea pollock fishery was managed under cooperatives in 2000 and subsequent years. The highest removal rates now average (2000-2002) about 60,000 mt per week compared to 100,000 mt per week before cooperatives. TACs in recent years have been trending higher, so that a peak week of 60,000 mt is, on average, slightly less than 5% of the TAC.

One of the more effective 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, NOAA Fisheries 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, NOAA Fisheries 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.

The pollock trawl fishery has an extensive history of Steller sea lion protection closures beginning in 1992 with the first rookery closures. In 1999, NOAA Fisheries 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, NOAA Fisheries 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. For 2002, the stock was estimated to be at 28% of the theoretical unfished biomass (i.e., female spawning biomass; Dorn et al. 2002).

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 NOAA Fisheries 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 NOAA Fisheries 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, NOAA Fisheries 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 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.

Barbeaux and Dorn (2003) investigated the EBS winter pollock fishery to determine whether localized depletions are occurring and could be detected through existing data from the trawl fishery and the winter acoustic survey. Their analysis largely investigates analytical methods, and results are mixed. They consistently found dense aggregations of pollock in the eastern half of the foraging area (Amak Island area), yet found no significant correlations between fisheries and depletions of prey, also stating that "the EIT survey biomass estimates for 0.9x14.8 km resolution could be inaccurate in less than a day." calling into question the usefulness of the approach in determining small scale localized depletions. In general, no firm conclusions can be drawn from this initial analysis yet it may have potential in the future.

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, NOAA Fisheries, 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 NOAA Fisheries 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 inside the closure areas. However, the experiments show that Atka mackerel outside the closure areas that are exposed to trawling would be susceptible to localized depletions. In Seguam where this experiment occurred, the habitat is dis-continuous near the trawl exclusion boundaries which may affect movement across the boundary. In other areas where the habitat is continuous there may be more of a flow of fish across the boundary, further experiments are necessary to determine if the results from this experiment can be extrapolated to other areas. Also, 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, NOAA Fisheries 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, NOAA Fisheries 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, NOAA Fisheries explored the issue of the edge effect in section 5.3.1.7. NOAA Fisheries 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 NOAA Fisheries 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 NOAA Fisheries 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 (Elizabeth Conners pers. comm.). In summary, NOAA Fisheries 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

A description of the ESA standards, pertinent definitions, and a description of this analysis was presented in Section 1.9 of the 2001 BiOp. Section 7(a)(2) of the ESA (16 U.S.C. section 1536(a)(2)) provides that each federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat designated for the species.

> ***Jeopardize the continued existence of*** [a listed species] means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both survival and recovery of a listed species in the wild by reducing the reproduction, numbers of distribution of that species.
>
> ***Destruction or 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. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.

The ESA clearly establishes two separate standards by which agency actions must be judged. The jeopardy standard focuses on the continued existence of the listed species itself, requiring examination of the effects of agency action on the species' reproduction, population and range. Adverse modification, in contrast, addresses the effects of agency action on the species' habitat, focusing on impacts to the particular qualities that make the habitat critical to the survival and recovery of the listed species. Although there is considerable overlap between these two standards in our evaluation of the groundfish fisheries, our assessment of the likelihood of jeopardy examines *the population's response* while our assessment of adverse modification examines the effects on *the availability of an adequate prey field inside critical habitat*. The adequacy of the conservation measures will be evaluated in terms of these two standards.

In this section we focus on question number 2, part 3, from the Balsiger memo (2003) which states that NOAA Fisheries shall respond with:

> *an explanation of why the revised Steller sea lion protection measures relieve the impacts that caused jeopardy and adverse modification of critical habitat.*

In this section we further explore the relationship between the conservation measures implemented by NOAA Fisheries (evaluated under the 2001 BiOp) and jeopardy and adverse modification of critical habitat. The issues discussed here will specifically relate to those raised by the Court in its December 18, 2002 Order under section 2 starting on page 28.

A. FMP BiOp - finding of jeopardy and adverse modification of critical habitat

The analysis in the FMP BiOp supported a determination that certain groundfish fisheries authorized by the FMP were likely to jeopardize the continued existence of endangered Steller sea lions and adversely modify their critical habitat. These determinations resulted from available evidence of competitive interactions between the fisheries for pollock, Atka mackerel and Pacific cod and Steller sea lions. This competitive interaction, occurring at the global, regional and local scales was shown to jeopardize the continued existence of Steller sea lions by interfering with their foraging opportunities for the three major prey species resulting in reduced reproduction and survival. The reduction in survival and reproduction has enhanced the decline in the numbers of sea lions relative to an unfished action area. Scientific evidence suggested that the same competitive interaction had also adversely modified critical habitat designated for Steller sea lions by reducing the availability of the prey field at temporal and spatial scales relevant to foraging sea lions. Because the competitive interaction was the basis for both the determinations of jeopardy and adverse modification of critical habitat, the RPA in the FMP BiOp avoided jeopardy and adverse modification by requiring FMP amendments that protected both the population from the adverse competitive effects of the fisheries but also protect the availability of an adequate prey field inside critical habitat.

B. The "zonal approach" - reducing overlap in the 2001 BiOp and the seven questions

In the FMP BiOp (section 6.4.2.6), a series of seven questions were used to identify the areas of overlap between the foraging habits of Steller sea lions and the harvesting patterns of individual groundfish fisheries (see review in section III(A)). The greater the degree of overlap, reflected by affirmative answers to the seven questions, the greater the concern that competitive interaction occurred. The procedure identified the pollock, Pacific cod and Atka mackerel fisheries as having such competitive interactions with Steller sea lions (for each fishery, affirmative answers were given to all seven questions). This procedure was also used in this remand in section III(A) to highlight the areas of concern with the pollock, Pacific cod, and Atka mackerel fisheries.

While the most extreme approach to eliminating competition would suggest implementing actions that address every point of overlap; that approach is not necessary to avoid jeopardy and adverse modification, nor is it possible without the complete elimination of fisheries. The interactions with Steller sea lions arise not only from the actions of the groundfish fisheries themselves, but also from the behavior, foraging habits and life history patterns of Steller sea lions (see section III(A)). However, a number of means of avoiding the competitive interaction are available. Questions 1 and 2 in section III(A) address the extent to which Steller sea lions forage on target fish species. Given the answer to questions 1 and 2 are positive (and cannot be changed), consideration of the overlap underlying questions 3 - 7 would identify those opportunities to avoid jeopardy and adverse modification by constraining, rather than eliminating fisheries for pollock, Pacific cod and Atka mackerel. However, as discussed in section III(A) questions three and six apply to the physical characteristics of the fishery, size of fish harvested and the depth of the fishery, and again neither of these factors could be easily changed. This leaves questions four, five, and seven as the types of interactions between fisheries and sea lions which have opportunities for mitigation. They are also the critical aspects of the competitive interaction between sea lions and fisheries.

The logic used in the Steller sea lion conservation measures (section I(D)) to avoid jeopardy and adverse modification was to implement actions for individual forms of overlap, which when combined, reduce the competitive interaction sufficiently to avoid jeopardy and adverse modification. 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:

Question 4. Fisheries which overlap spatially with the area used by Steller sea lions to forage on pollock, Pacific cod, and Atka mackerel,

Questions 5. Fisheries which overlap temporally with Steller sea lions foraging for pollock, Pacific cod, and Atka mackerel, and

Questions 7. Fisheries which operate in a spatially or temporally compressed manner in Steller sea lion foraging habitat.

In an attempt to summarize the vast quantity of information about the fisheries presented in sections II and III, Table IV-1 was developed which combines much of this data in one table which makes it easier to compare fisheries and management measures. The types of management measures are listed (regulatory and performance), the general description of the action, the specific action, and the general rules used to evaluate that management measure. Each cell was then color coded with green, yellow, or red. Green indicates that the management goal was reached, or that there is little concern for this component. Yellow indicates an area of some concern; either the goal was not reached, or some synergistic event occurred which may have increased adverse effects. Red indicates an area which might be perceived as either a reduction in protection for sea lions, or an area where the goals for protection were not reached. Red does not indicate jeopardy; NOAA Fisheries is evaluating the entire package, balancing all the various impacts to determine if they reach the level of jeopardy and adverse modification of critical habitat as a whole. This table provides a qualitative and digestible view of the complex suite of management measures. The table provides a column which indicates the scientific data used for the summaries. This table is helpful to flag areas that need more discussion. We will spend more time discussing those fisheries in red and yellow. In this section we will only be examining the individual fisheries and the relative possible effects of each measure. In the jeopardy and adverse modification analyses below we will synthesize this all together to come up with one conclusion based on the entire suite of measures.

Based on information in the FMP BiOp and the 2001 BiOp (section 5.3.1.6), NOAA Fisheries will continue to use a hierarchy of concern by gear type in the evaluation of jeopardy and adverse modification. That hierarchy is: Trawl, hook-&-line and pot, and jig in order of those most likely to cause localized depletions due to their removal rates and other effects described in previous opinions.

Question 4 - spatial overlap

Reducing competitive interactions between groundfish fisheries and Steller sea lions by spatial partitioning is a viable approach, and was the core aspect of the conservation measures adopted by NOAA Fisheries in 2001. The extent to which partitioning would be useful, however, varies with both the use of the area by sea lions and the extent to which harvesting occurs in that area. For instance, complete spatial partitioning could only be accomplished by prohibiting groundfish fisheries from operating in all places where Steller sea lions forage on pollock, Pacific cod, and Atka mackerel. This would include all designated critical habitat plus adjoining areas of the continental shelf and slope in the Gulf of Alaska, Bering Sea and Aleutian Islands. However, this approach fails to account for the concept that infrequent instances of overlap should not be treated the same as instances of intense overlap. Instead, the action employs partitioning rules that reflect differing use of critical habitat by Steller sea lions.

In the 2001 BiOp, NOAA Fisheries used the zonal approach to qualitatively describe the level of concern for the various areas of critical habitat and evaluate the probably effects of fishing on these zones (2001 BiOp, Table 5.2). The first 4 zones described there relate to the spatial overlap issue. In this remand, NOAA Fisheries has combined the 0-3 and the 3-10 nm zones into one zone from 0-10 nm (see section II(B) for further discussion on the rationale for the change in zones). The primary rating of each zone (see Table II-9) is based on the occurrence of sea lions, their likelihood of foraging in those areas, and the component of the population (i.e., pup, juvenile, pregnant female, etc.; see Table 5.2 of 2001 BiOp). Page 27 of the Court Order (lines 7-11) state that "[n]onetheless, this sum does not support the differing ranking of importance of the 3-10 nm and 10-20 nm zones ..., because the relevant filtered data shows that Steller sea lions use the 3-10 nm and 10-20 nm zones almost equally. ... Thus NOAA Fisheries 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." In this supplement, section II was devoted to resolving this issue raised by the Court, resulting in the conclusions expressed in Table II-9 after consideration of the entire body of telemetry research as well as new specific analyses on juvenile foraging patterns.

The following discussion is a review of the regulatory and performance measures associated with the spatial overlap and the conservation objectives.

Regulatory measures:

In Table IV-1, under regulatory measures, the first conservation measure is spatial overlap followed by the various zones of critical habitat that it applies to. Here we provide more information than those specific zones used for the jeopardy analysis (Table II-9). The guidelines relate directly back to the zones of concern and the amount of critical habitat necessary for closure. In the 0-10 nm zone, 75% closures were used as a guideline reflecting a high amount of concern for this area and the telemetry data (Tables II-7,8,9). This closure represents 77,417 km^2 of foraging habitat out of a total of 103,223 km^2. In the 10-20 nm zone, the guideline is 50%, again a substantial closure related to the amount of concern (or likelihood) that competition occurs in this zone. We took more of a qualitative look at the foraging areas since each one was so different in its geographic location and relationship to sea lion foraging requirements.

The pollock and Atka mackerel fisheries are in green with substantial closures in all areas, meeting the guidelines provided. Yellow and red areas show up in the Pacific cod fisheries with yellow in the AI and red in the GOA. For the AI, yellow levels were found for all gear types in the 10-20 nm zone and for critical habitat overall. Given the very narrow shelf in the AI, closures out to 20 nm would completely close the fishery. Additionally, sea lion telemetry data specific to the AI indicates that they stay closer to shore than other areas and when they make trips beyond 10 nm they are usually long trips far off-shore into deep water where the fishery does not occur (ADF&G and NOAA Fisheries 2001). In the GOA for Pacific cod trawl all areas were green - which was reflective of NOAA Fisheries hierarchy of concerns by gear type. Generally, all areas were red for fixed gear fisheries. However, the effect of this is expected to be relatively small (but not zero) given the nature of the gear type and the amount of area closed (32% of 0-10nm). Another mitigation factor is that Pacific cod is most important in sea lion diet in the winter time, therefore other management measures such as temporal dispersion is a key component in this program and will be discussed further below.

Performance measures:

In Table IV-1, under performance measures , two conservation measures are listed that relate to closures areas; the observed change in fishing spatial patterns from 1999, and displaced fishing effort. In the Court Order, Judge Zilly stated on page 31:

> "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 had not been developed. 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. 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 central question under performance measures speaks directly to the Court's statement above - that in order to remove jeopardy and adverse modification fishing patterns must change. Unfortunately, our inability to accurate predict where fishermen will exercise their choice to fish left some unanswered questions in the 2001 BiOp. Certainly, they will not be fishing inside closed areas, but areas that are open might be fished heavily or lightly depending upon the availability of the resource, the proximity to good ports, and of course the weather. For this supplement, we have the luxury of quality fishing data to review and provide a precise description of how the fishery was prosecuted. In this way we can review the success of the conservation measures and their ability to make meaningful changes to the fishery in order to avoid jeopardy and adverse modification.

Looking first at the observed fishing spatial patterns in relation to 1999 (Table IV-1), we see that there are mixed results. For pollock fisheries, all were green except for the EBS trawl fishery which was red. In that fishery, catch in critical habitat increased in all areas with a 49% increase in the 10-20 nm zone. This was not unexpected given the regulatory mechanisms which were implemented - largely reducing previous 20 nm closures to 10 nm. Again, 10-20 nm is an area of less concern than 0-10 nm, but such a large decrease in the protection zones may have some adverse effects. The AI pollock fishery was closed completely (green). The Atka mackerel fishery was green as catch was down by 77% in the 3-10 nm area and down 12% overall in critical habitat.

For Pacific cod, Trawl was yellow in the BSAI due to increases in the 10-20 nm zone (up 25%), but was down by 50% in the 3-10 area of critical habitat. We didn't look at 0-3 nm as these areas were almost entirely closed and counted for such little historical fishing. Fixed gear cod fisheries in the BSAI were green (substantial reductions in catch) as well as gear types less likely to compete with sea lions (compared to trawl). For GOA cod fisheries, both trawl and pot were yellow due to decreases in 0-10 which was less than 25% and increases in the 10-20 nm zone. Both also had increases overall in critical habitat. Here again, some of the concern with these fisheries were mitigated with the addition of seasonal restrictions. The cumulative catch for all species was yellow, with catch down 49% in 3-10, up 46% in 10-20, and up 22% in critical habitat overall (Table III-7f).

Looking at the amount of displaced fishing effort in Table IV-1 (bottom line), again we see mixed results. For pollock, all are green except for the EBS trawl fishery which is red. For EBS trawl only 1% of the fishing effort in 1999 was prohibited (or changed) when compared to current closure measures. In other words, when we overlay the current circles of closed areas with the historic fishing locations in 1999, only 1% of the fishery was required to move, presumably, further offshore. One explanation is that the nearshore areas (e.g., 0-10 nm) were already closed to a great extent by the measures required by the RPA in the 1998 BiOp.

Atka mackerel fisheries were also green, with 18% of the 1999 fishing areas being closed. For Pacific cod, changes in displaced fishery amounts were less dramatic. Here, the gear types were evaluated with different guidelines as listed in the table. Cod trawl in the BSAI was colored red due to only 4% of the fishery being displaced (compared to 1999 patterns). Both the fixed gear fisheries in the BSAI were yellow due to fishery displacement amounts between 2-5%. In the GOA, trawl and pot cod was green while hook-&-line was yellow due to a displacement value of 4%.

Question 5 - temporal overlap

Reducing competitive interactions between groundfish fisheries and Steller sea lions by temporal partitioning is a viable approach, and was a component of the conservation measures adopted by NOAA Fisheries in 2001. As in the case of spatial partitioning, it must be applied when the competitive interactions are most likely to occur. There are seasonal differences in the frequency of occurrence of pollock, Pacific cod and Atka mackerel in sea lion diets that suggest a targeted application of temporal conservation measures primarily aimed at limiting harvest amounts in the winter. NOAA Fisheries has concluded that the winter, in particular, requires catch limitations as it is a particularly sensitive period for Steller sea lions. Not only are juveniles learning to forage and find resources as this time, but their energy demands are very high due to their large growth rate over the first few years of life. For females with pups, their energy demands are about double their requirements without a pup (Winship et al., 2002; Winship and Trites, 2003) which makes them potentially susceptible to a reduction in available prey. Under these conditions, a pregnant and nursing female may be more likely to abort the growing fetus which was implanted the previous summer. A recent report by Holmes and York (in press) also implicates reduced fecundity in the 1990s as a possible cause of the continuing decline of the western DPS of Steller sea lions.

Regulatory measures:

In Table IV-1, under regulatory measures and temporal overlap (conservation measure) seasonal closures is listed as a specific action. The guidelines were not specific in this case, only that there be a winter closure specifically for trawl fisheries to provide a substantial time period in which case there would be no chance for competitive interactions across the sea lion's range in Alaska (i.e., western DPS). Substantial closures exist for trawl fisheries (green) while non-trawl fisheries are listed as yellow because there are no closures. Again, the impacts from non-trawl fisheries are likely to be less while fishing effort from November to the end of December has traditionally been light (Figs. III-4,5,6; see fourth quarter catch).

Under regulatory measures and localized depletions, seasonal distribution is listed as a specific action which directly relates to temporal overlap. The guideline was based on fisheries with a 50/50 seasonal dispersion by each half of the year. Pollock and Atka mackerel were all colored green in the BSAI and GOA while Pacific cod was mixed. Both trawl cod in the BSAI and GOA were colored yellow due to higher catch apportionments in the winter (i.e., first) season. In the BSAI, up to 80% can be harvested in the first half of the year, while in the GOA catch is capped at 60% before September 1 of each year. GOA trawl cod is also colored yellow due to regulatory problems which allowed substantial amounts of bycatch to be taken in the fishery in the first half of the year which undermines the regulations limiting Pacific cod removals in the first half of the year (NOAA Fisheries, unpublished data). Non-trawl fisheries were also capped at 60% in the first half of the year, but were rated as green due to the nature of the gear used (i.e., non-trawl).

Additionally, as described in section III(B) of this biological opinion, the pollock cooperatives established under the AFA have resulted in substantial changes to the fishing pattern of the EBS pollock fishery since 1998, and have been a required component of the conservation measures in the BSAI. It was not listed as a separate category as it was a very specific action taken for one fishery, yet, the results are indisputable and positive for sea lion conservation efforts. Currently, fishery rationalization is underway in the GOA which might result in similar slowing of the fishery as well as dispersement of the fleet.

Performance measures:

In Table IV-1, under performance measures , the observed change in fishing temporal patterns from 1999 is considered. The guidelines for this factor were listed as green for fisheries with a catch of less than 40% in the first quarter, yellow for 40-50 %, and red for greater than 50%. The Atka mackerel fishery was evaluated qualitatively based on maximum daily harvest rates. Also factored in qualitatively was the relative change in the temporal patterns from 1999. For pollock and Atka mackerel in the BSAI and GOA the cells were colored green with good seasonal distribution. However, the Pacific cod fisheries did not perform as well. BSAI trawl cod was red due to about 60-70% of their catch coming from the first quarter (i.e., about the same as previous years including 1999). BSAI hook-&-line cod fisheries were colored yellow, and were unchanged from 1999 as well with about 40-50% of the catch coming from the first quarter. BSAI pot cod was more variable with between 60-95% of the catch occurring in the first quarter, with the majority of the remaining catch in the second quarter.

In the GOA, trawl cod was listed as yellow due to 40-70% of the catch occurring in the first quarter with about 55% in 2002 compared to 70% in 1999 (i.e., there was a reduction from 1999). Hook-&-line gear was listed as yellow with 70-90% over the last three years with 75% in the first quarter in 2002 and 30% in 1999. GOA pot cod was listed as green due to about 40% of the catch being taken in the first quarter.

Question 7 - overlap with temporally/spatially concentrated fisheries

Reducing competitive interactions between groundfish fisheries and Steller sea lions that result from the temporal and spatial concentration of prey removals is also a viable approach and was a component of the conservation measures adopted by NOAA Fisheries in 2001. The intention of these measures was to disperse the fishery removals in time and space, thereby reducing the likelihood that fisheries would reduce the availably of prey for Steller sea lions (i.e., cause localized depletions). The conservation measures use a variety of tools to temporally, and in some cases spatially, allocate groundfish TAC in order to reduce the intensity of fishing effort in a particular season.

Regulatory measures:

In Table IV-1, under regulatory measures, localized depletions is listed with two action items: seasonal distribution and "CH catch limits". Seasonal distribution was discussed above under temporal measures. Under critical habitat catch limits, all Pacific cod fisheries are listed as yellow because no limits exist. Catch limits were a core component of previous RPAs and conservation measures for pollock and Atka mackerel (i.e., 1998 BiOp and 2000 BiOp), but were largely left out of the 2001 conservation measures. This change in approach was due, in part, to new telemetry information from juveniles which indicated greater usage of the 0-10 nm area than beyond 10 nm from shore. This provided opportunity for the fishery to trade extensive near shore closures for unlimited catch (within TAC limits) in critical habitat beyond 10 nm. Previously the area considered to be of core importance to sea lions was within 20 nm. If this area were closed (such as under the injunction in 2000) the fishery would be so severely restricted that much of the

TAC would go unharvested as very little fishable biomass exists beyond 20 nm from shore in the GOA and Aleutian Islands (to a lesser extent in the EBS). Therefore, under the 2000 BiOp for example, to allow fisheries to occur inside critical habitat, in an area considered at the time to be of core importance to foraging juvenile and lactating females, harvest limits were required to insure that the habitat was not adversely modified. Therefore, the lack of harvest limits in critical habitat is now considered to be yellow such that the existence of limits would likely be more protective. The lack of critical habitat catch limits is likely to have some adverse effects on the portion of the population foraging in 10-20 nm and critical habitat beyond 20 nm.

For EBS trawl pollock, a catch limit was implemented for the A season, with 28% of the annual TAC available until April, with the remaining 12% available in the A season after April 1. This measure is not effective in limiting catch in the SCA and is according to our review of the catch data, a superfluous regulation. This limit allows up to 70% of the A season catch to be removed from the SCA (critical habitat) in the EBS before April 1. This is about the amount that the fishery removed from this area before conservation measures were implemented in 1999, essentially regulating status-quo before 1999. For this reason, this fishery was colored yellow and not green. The regulation is not adverse to sea lions, but it doesn't provide any added protection either.

The Atka mackerel fishery is the only one with legitimate catch limits which increased protection for Steller sea lions beyond what was in place in 1998. For Atka mackerel, only 60% of the annual TAC can be harvested from critical habitat; the limit was actually 70% under the 2000 BiOp based on estimates of the amount of biomass in critical habitat due to the narrow shelf in the Aleutian Islands. Therefore, NOAA Fisheries does consider this to be a conservative measure and has colored this cell green.

Performance measures:

In Table IV-1, under performance measures, harvest rates in critical habitat are listed under conservation measures. This analysis was based on Tables III-7(a-f), which was an attempt to look at the relative catch amounts in various areas of critical habitat, by season, as well as the amount of fish biomass left behind for Steller sea lions to forage on. The guidelines are listed in the table based on qualitative assessments of the relative change in harvest rates in important areas of critical habitat from 1999 as well as the comparison to the annual harvest rate.

For Pacific cod in the BSAI, the 0-10 nm area was colored green due to substantial reductions in the harvest rate. All other areas were colored yellow due to harvest rates similar between 1999 and 2002, with rates in the winter roughly double the annual harvest rate. GOA cod fisheries were colored green in all areas due to decreases in catch rates in all areas in winter with some increases in the summer which was the goal in order to disperse harvest throughout the year.

For pollock in the GOA, there were substantial reductions in the catch rate in the winter inside critical habitat, and in critical habitat overall which resulted in a green rating in all areas. The AI pollock fishery was completely closed. For the EBS pollock fishery, all areas were colored either yellow or red. For the 0-10 nm area, colored yellow, catch rates increased from 1999-2002 (i.e., primarily due to harvest off St. George Island) but were still well below the annual catch rate. All other areas were colored red due to increases in catch and catch rates in the 10-20 nm, foraging areas, and critical habitat overall.

For Atka mackerel, all areas were rated green except for the 10-20 nm which was rated yellow due to increases in the catch rate of about 2-3% over 1999, with rates overall slightly above the annual rate.

C. Jeopardy Analysis

In the 2001 BiOp, NOAA Fisheries walked through a jeopardy analysis (section 7.1.1, pages 178-182) which included a three step process. After review, the Court did not find fault with this approach, or the underlying logic:

> "The Court notes that NOAA Fisheries'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."

However, the Court did find fault in NOAA Fisheries's interpretation of the data, and found that it was arbitrary and capricious. In this analysis we will be focusing on the specific areas which the Court found weak in the 2001 BiOp and provide further explanation of NOAA Fisheries's understanding of Steller sea lion requirements, effects of fishing, and whether the current approach is reasonable and avoids jeopardy.

Discussion of telemetry data and the zones of importance to Steller sea lions

The crux of the Court's decision that NOAA Fisheries was arbitrary and capricious flows from the weighting of the telemetry data and the rating of the zones of importance to Steller sea lions. In this supplement we reviewed all the known data on sea lion foraging using satellite telemetry and have concluded the following. First, near shore habitat (i.e., 0-10 nm) is used by sea lions to a much greater degree than other areas of the ocean, especially for pups and juveniles and females with pups. This is described by NOAA Fisheries in Table II-9 (and supported by data in Tables II-3,4,5,6,7, and 8 and discussion in section II). Second, NOAA Fisheries made a decision to combine the 0-3 nm and 3-10 nm zones for this analysis based on the accuracy of the telemetry data and the understanding of sea lion biology by NOAA Fisheries' experts. Although this might appear to be a change in approach to avoid dealing directly with the Court's decisions, it is the responsibility of NOAA Fisheries to use the best available scientific information, and that information led NOAA Fisheries to the decision that a 3 nm circle was too small of an area based on the accuracy of the Argos system of determining locations (see discussion in sections II(B,C)). Third, there was a fundamental change in the amount of telemetry data and the level of analysis of that data between the time the FMP BiOp was written and the decision made in the 2001 BiOp which revealed that sea lions used areas inside 10 nm much differently than those areas beyond 10 nm (see section II(B); also Haflinger, 2003). Although NOAA Fisheries determined that jeopardy resulted from fisheries operating within 20 nm in the FMP BiOp, that should not prejudice NOAA Fisheries's ability to refine that reasoning based on new data or new analyses on sea lion foraging characteristics. Fourth, information is lacking for juveniles in the winter, for older juveniles ages 2-4 years of age, and for lactating females during the winter. These animals may range farther offshore and be vulnerable to nutritional stress due to the energetic demands placed on them by rapid growth rates for juveniles and for females which are nursing a pup while carrying a growing fetus (i.e., their energetic demands may be double that of a non-lactating adult female).

Nutritional stress in the western DPS of Steller sea lions

For fisheries to have an effect on sea lions, it would either have to be direct (e.g., incidental catch in fishing nets, shooting, disturbance) or indirect (e.g., nutritional stress). The direct mechanisms are not considered to be a significant contribution to the current decline and are discussed thoroughly in both the FMP and 2001 BiOps. The effects considered here in this supplement are those which would be indirect through nutritional stress.

Considerable evidence suggests that nutritional stress significantly reduced Steller sea lion reproductive performance in the 1970s and 1980s, as summarized by Pitcher et al.(1998). Pitcher and Calkins (1981) found evidence of low birth rates (55-63%) for Gulf of Alaska females sampled in the 1970s and 1980s, indicating a shortage of food or disease. Indications of disease are not supported by the data, but food shortage is. Observed birth rates in Gulf of Alaska Steller sea lions support the hypothesis that nutritional stress affected the reproductive performance of Gulf sea lions during the 1970s and 1980s, when "substantial embryonic and fetal mortality" occurred between late fall (when the embryo implants in the womb) and late gestation in the spring (Pitcher and Calkins, 1981; Calkins and Goodwin, 1988; Pitcher et al., 1998; NOAA Fisheries, 1998, 2000). These findings are consistent with research on Antarctic fur seals, whose pregnancy status and birth rates in the summer months appeared strongly related to food resources in the previous fall and winter seasons (Lunn and Boyd, 1993; Boyd et al., 1995; Boyd 1996), and with the findings of research on fur seals and sea lions more generally (e.g., Pitcher and Calkins, 1981; Calkins and Goodwin, 1988; Costa et al., 1989; Trillmich and Ono, 1991; Costa et. al., 1993; Pitcher et al., 1998; NOAA Fisheries, 1998, 2000). Pitcher et al. (1998) concluded on the basis of the available information on sea lion body condition and failure of pregnancy during late gestation that under-nutrition in the 1980s was the likely major cause of reproductive failures in Steller sea lions from the Gulf of Alaska.

While much attention has recently focused on juvenile sea lion survival, lower reproductive success is almost certainly a factor in the decline of the western population (NOAA Fisheries 1998, 2000). Steller sea lion females that have reached breeding age face considerable energetic demands to sustain reproduction for the remainder of their lives (Riedman, 1990; Winship and Trites, 2002). The combined effects of reduced reproductive success (i.e., low birth rates) and reduced juvenile survival can be expected to appreciably reduce their likelihood of survival and recovery (Holmes and York, in press; NOAA Fisheries, 2001). Thus increased juvenile survival and improved female reproductive success are important to the recovery of the species.

As with other sea lions and fur seals in the otariid family, Steller sea lion reproductive biology has been characterized as energetically expensive and is therefore highly sensitive to the effects of food shortage and nutritional stress (Costa, 1993; Pitcher et al., 1998; NOAA Fisheries, 1998, 2000). Nursing and pregnant Steller sea lion females have exceptionally high metabolic demands and may need nearly twice as much food as non-nursing animals to maintain themselves and a pup over the course of a fall and winter while simultaneously carrying a fetus to term and delivering a healthy newborn in the following summer (NOAA Fisheries, 1998, 2000; Winship, 2000; Winship and Trites 2002). Unlike phocid seals, which largely meet energetic demands of lactation through stored blubber resources, fur seal and sea lions are dependent on continuous food supplies throughout an extended lactation period - as long as 1-3 years in Steller sea lions (Thorsteinson and Lensink, 1962; Pitcher and Calkins, 1981; Porter, 1997; NOAA Fisheries, 2000). Studies of fur seals indicate that food shortages in one season may affect the pregnancy status of females in subsequent seasons, blocking estrus, terminating pregnancy, and preventing lactation (Lunn and Boyd, 1993; Costa, 1993). Studies of sea lions are more difficult to conduct, but it is generally agreed that Steller sea lion reproductive biology is optimal for prey that is concentrated and predictable (Pitcher et al., 1998; Sinclair and Zeppelin, 2002). Extended lactation periods, reliance on food supplies adjacent to the rookery or haulout site where dependent pups are located, and a need to make continuous foraging trips are all keys to understanding sea lion reproductive fitness and success (Pitcher et al., 1998).

Comparisons of adult female body measurements and masses from three time periods, 1958, 1975-1978, and 1985-1986, showed reduced growth and an increased level of abortions in the 1980s (Calkins et al., 1998). Analyses of samples collected from 1975-1978 and 1985-1986 showed that in 1985 animals were smaller, maturity was later, there were fewer adult females with offspring, adult females that did have pups were older, and there were Steller sea lions with reported signs of anemia (York 1994, and Calkins and Goodwin 1998). Calkins *et al.* (1998) also noted that the harbor seal, which feeds on similar prey as Steller sea lions, declined rapidly at a major rookery in the Gulf of Alaska during the late 1970s (Pitcher, 1990) indicating that changes to the prey base may have caused this sympatric species to suffer from nutritional stress. Factors such as disease and predation may have had an influence on the population during the rapid decline, but there is not sufficient information to evaluate their possible impact (NOAA Fisheries 1992).

While direct evidence for nutritional stress in the second phase of the decline (1990s-present) is largely lacking (DeMaster et al., 2001), there is indirect support that it may still be one of the primary factors threatening the population. For instance, modeling studies based on sea lions in the central Gulf of Alaska indicate that declines in fecundity accounted for almost half of the decline observed in the 1990s (Holmes and York, in press). Declines in fecundity are generally associated with nutritional stress, or the effects of certain diseases or contaminants, and since there is little evidence that diseases or contaminants have been a problem, nutritional stress in indirectly implicated. Reductions in sea lion carrying capacity of the environment have also been shown through analyses of the rates of decline at individual rookeries in relation to their initial population sizes. Larger rookeries and haulouts tended to decline faster than smaller ones. This density-dependent response is suggestive of a bottom-up process acting on the population, such as reduced prey availability resulting in nutritional stress (Hennen, 2003 Symposium). Other modeling studies (conducted using data from sea lions in Oregon) suggest that sea lions are quite sensitive to local reductions in prey abundance. Reductions of as little as 20% were predicted to delay sexual maturity (which would decrease fecundity), while those greater than 25% were predicted to reduce juvenile survival such that there would be significant population level responses (Malavear, 2003 Symposium).

Nutritional stress could result from decreased foraging success due to competitive interactions with fisheries or through environmental changes causing decreased prey availability or prey quality (Trites and Donnelly, 2003). If sea lions are now eating more prey of lower energy density (e.g., gadids) than they did previously, then they would have to consume more fish biomass to obtain the same amount of energy (as much as 56% more pollock than herring, for instance; Rosen and Trites 2000). However, review of the pinniped diet literature and ongoing work reveals that gadids constitute a significant part of the diet of Steller sea lions in southeast Alaska where sea lions are increasing (Trites, 2003 Symposium), are a large part of the diet of northern fur seals while they are on their breeding rookeries on the Pribilof Islands in the summer (Kajimura, 1984; Sinclair et al., 1994), and may have been a significant component of the Steller sea lion diet decades ago when the population was considerably larger (Imler and Sarber, 1947; Perlov, 1975). Therefore, there remains considerable uncertainty about the role that differences in energy density among various species of prey has played in causing nutritional stress in Steller sea lions.

The lack of information on the nutritional stress of juveniles (suspected to be a key population segment in the decline) is problematic (Loughlin and York, 2000). NOAA Fisheries is required to insure that the groundfish fisheries do not jeopardize Steller sea lions or adversely modify their critical habitat - but this does not mean going to the extreme of having to prove all negatives in order to do so. The question remains is whether nutritional stress is likely to be contributing to the continued decline of the western stock? Clearly, there is scientific uncertainty over the issue, yet it is likely that nutritional stress is playing a role as a part of the decline (DeMaster and Atkinson, 2001; NOAA Fisheries, 2000, 2001; NRC, 2003).

As noted above, juvenile Steller sea lions are particularly vulnerable to reductions in prey availability because of their inexperience at foraging (compared to adults reduced ability to store fat), have relatively greater metabolic demands (high growth rates), are more susceptible to the rigors of seasonal climatic changes, and are more vulnerable to the risks associated with additional foraging effort (e.g., predation by killer whales). That is, juveniles experiencing reduced foraging success would have to increase their foraging time and energy expended, and by doing so would be at greater risk of predation. As the energy costs of foraging increased, they would be less likely to meet their energetic needs. If they are unable to do so, then their physical condition will deteriorate. As their condition deteriorates, their ability to forage and avoid predators would be compromised, resulting in a self-reinforcing downward spiral. The consequence would be a reduced likelihood of survival due to starvation, predation, or disease or an increased age of sexual maturity (thus reducing the average fecundity of females in the population). As indicated by York (1994) the portion of juveniles lost to the population need not be large (10% to 20%) to result in a population decline (Loughlin and York, 2000).

Adult, female sea lions are also vulnerable to reductions in prey availability because they are required to forage not only for themselves, but also for their offspring with high energetic demands through the winter. Mature adult females may be pregnant and therefore facing the demands of a growing fetus, and at the same time may be nursing offspring already born. The females that are most successful are those that contribute most to the future gene pool; i.e., produce and rear pups that survive and eventually produce pups of their own. Whereas the challenge for juvenile sea lions is survival, the challenge for adult females is to maximize their reproductive contribution to the population. As the overall reproductive contribution of adult females is a function of their survival and reproduction, and as their survival and reproduction may be affected by their nutritional condition, adult females are likely vulnerable to reductions in prey availability. With reductions in local prey availability, females may be required to commit more energy to foraging (i.e, greater energy expenditure) or may be required to conserve their energy by decreasing their contribution to their offspring, or by compromising their own condition. If they compromise their contribution to their offspring, then those offspring may be less likely to survive. If they compromise their own condition, then they may reduce the likelihood of their own survival or future reproduction. At present, we are unable to measure adult survival to determine to what extent it may be compromised by existing conditions, but as described above and in section 3 of the 2001 BiOp (the Status of the Species), we have seen evidence that the reproductive effort and success of adult females has been compromised based on data from the 1990s (Holmes and York, in press).

Reductions in localized prey availability for prey-limited species must, then, affect the two primary determinants of population growth for a closed population, birth and survival (or mortality). In the absence of emigration or immigration, these two life table parameters determine the growth rate of the population which, for the western population of Steller sea lions, with the exception of the last two years, has been negative for over two decades. As a consequence, the mean number of animals at rookeries and haulouts also continues to decline. The recent increase in the non-pup count is intriguing. Although we must be cautious in interpreting this, it is suggestive that something has changed in the population to increase juvenile or adult survival. However, the pup counts continue to decline which suggest a continued decline in fecundity and recruitment (Sease and Gudmondson, 2002; Holmes and York, in press).

The response of sea lions to an increase in prey may also not be apparent for some years, although an abatement of the decline of sea lions should show up sooner in the annual pup counts (contrary to the latest survey). Counts of non-pups on the rookeries may not increase until juvenile survival improves and those animals reach reproductive age (see Berkson and DeMaster, 1995). More immediate changes in number of pups born may be observed if conditions improve significantly for adult females, but the recovery of the population will require improved juvenile survival as well as increased pup production.

In addition to a decrease in the number of animals at local sites, secondary or compounding factors may come into play that hasten the local populations to complete abandonment or extinction. Steller sea lions are gregarious animals and may, at some point, simply abandon a site if the number of animals using the site reaches some unacceptable low number or density. Similarly, as local rookery populations dwindle, the potential for deleterious genetic consequences may increase, as the population consists of fewer and fewer numbers of successful breeding age animals. Smaller local populations may also be more susceptible to rare and random events (e.g., oil spills, landslides) that could drive a local population to extinction. Such phenomenon are not merely hypothetical, but have already begun to occur. Certain haulout sites in the GOA, for example, have been partially abandoned. The proposed closure at Cape Barnabas was strongly contested in 1998 and 1999 because few animals continue to use the site and they appear to do so only seasonally.

The western population of Steller sea lions has declined for the past 20 years due to a combination of environmental and fisheries-related factors. Under the current FMPs and resulting fisheries, we can expect this population to continue its decline due to a variety of causal factors (Loughlin and York, 2000). Even if fishery related impacts to Steller sea lions were eliminated completely, we would expect the decline to continue as a result of environmental pressures that are also acting upon, and reducing, the survivability of this population. We can continue to expect reduced reproductive success in adult female Steller sea lions and reduced survival of juvenile sea lions, although as noted earlier, an increase in non-pup counts between 2000 and 2002 was recently reported by Sease et al. (2003). However, we are still required under the ESA to remove the likelihood that commercial fisheries will jeopardize Steller sea lions or adversely modify their critical habitat. Between 1990 and 2002 the western population of Steller sea lions declined an average rate of 4% per year (Table I-2). Avoidance of any fishery contribution to this decline will enhance the recovery of the species, but may not, necessarily reverse the decline.

There is general scientific agreement that the decline of the western population of Steller sea lions in the 1990s resulted primarily from declines in the survival of juvenile Steller sea lions and lowered reproductive success in adult females (Holmes and York, in press). There is less scientific agreement that both of these problems have a dietary or nutritional component (Merrick *et al.*, 1987; Pitcher, 1998; Rosen and Trites, 2000; DeMaster and Atkinson, 2001; NRC, 2003). The National Research Council (1996), based on the best scientific and commercial information available, concluded that the groundfish fisheries managed under the two FMPs may adversely affect Steller sea lions by (a) competing for sea lion prey and (b) affecting the structure of the fish community in ways that reduce the availability of alternative prey. The National Academy of Sciences recently implicated both killer whale predation and nutritional stress as probable components of the decline although they expressed greater concern for killer whale predation preventing the recovery of the western DPS of Steller sea lions than for nutritional stress (NRC, 2003).

Under normal circumstances, the life history of Steller sea lions would protect them from short-term declines in the reproductive success of adult females or the survival of juvenile sea lions. Steller sea lions are long-lived species with overlapping generations, a life-history strategy that protects them from short-term, environmental fluctuations. Their life history strategy would protect sea lion populations from variable survival and mortality rates caused by short-term phenomena like ENSO. However, this life-history strategy cannot protect Steller sea lions from changes in birth rates and juvenile survival that continue for two or three decades. The combined effects of reduced reproductive success and juvenile survival would be expected to reduce the size of the Steller sea lion population and continue their current rate of decline until either reproductive success or juvenile survival increase to a level where population stability or recovery is achieved.

Competition between fisheries and Steller sea lions

Competitive interactions between sea lions and fisheries could manifest themselves in similar ways to those resulting from natural environmental changes. Fisheries could affect the gross amount of prey available, either on local (e.g. "localized depletion") or ecosystem-wide scales (NOAA Fisheries, 2000) by removing fish. This is analogous to the potential changes in production of prey populations from natural change. Fisheries could also reduce the density of individual patches (through dispersion) or change the distribution, size, or number of patches in space (e.g., deeper, greater patch separation, smaller, fewer) in ways similar to those resulting from natural change. In addition, fisheries may affect sea lions through interactive competition (Baraff and Loughlin, 2000). Examples of interactive competition include disruption of normal sea lion foraging patterns by the presence and movements of vessels and gear in the water, abandonment of prime foraging areas by sea lions because of fishing activities, and disruption of prey schools in a manner that reduces the effectiveness of sea lion foraging. The composition of the fish community can change as a result of fisheries targeting particular species, and could affect sea lions:

- by reducing the amount, availability, or quality of prey available to sea lions. These effects would flow from changes in the composition of the fish community as a result of the history of fishing on one or more species in the North Pacific Ocean, including whales (e.g. "trophic cascade hypothesis" and "junk food hypothesis"),

- by increasing the rates of predation on sea lions due to prey switching by sea lion predators. This could occur if the population size of a preferred prey of a sea lion predator (e.g., killer whales) were depleted as a result of fisheries and the predator switched to eating more sea lions (Estes et al., 1998),

- by increasing the level of competition between sea lions and other groundfish consumers for a preferred sea lion prey.

It is because of these similarities and the uncertainties in our understanding of how marine ecosystems respond to change that tying the decline in Steller sea lions to a single or suite of causes has been so problematic.

Various approaches have been used to assess the potential for trophic competition between sea lions and fisheries. One involves establishment of direct causal linkages. Another involves the search for correlations between observed changes in sea lion vital rates or population trends and patterns in the fishery or fished stock, which assumes a link exists if a correlation can be demonstrated. A third approach investigates the extent of overlap between fisheries and sea lions using various criteria, which permits reasonable inferences to be made regarding the potential and relative magnitude of fishery competition with sea lions.

The first approach was suggested by Lowry and Frost (1985) who listed four conditions that must be established to conclude that a fishery is impacting a marine mammal population through reduction of its food supply: 1) fishery harvests in combination with other removals must reduce the prey stock(s); 2) changes in abundance of prey species must cause changes in the marine mammal's diet; 3) changes in food intake must result in changes in vital parameters (growth, reproduction, or survival) of individual marine mammals; and 4) changes in vital parameters must have effects on population characteristics such as abundance or productivity. Clearly, one of the effects of commercial fishing in the GOA and BSAI regions is a major reduction in the biomass of target species below that which would otherwise occur (NOAA Fisheries, 2001). There are no data available to assess whether the actual diet of sea lions would be different if fishing was not occurring. There is strong evidence that growth rates of sea lions have declined between the 1970s and 1980s, and that this change is very likely due to nutritional limitation (Calkins et al., 1998). Finally, major declines have occurred in sea lion abundance indicating that vital rate changes have affected the population.

The second approach uses the observation of potential relations (correlations) to evaluate whether or not a fishery may have had a significant impact on Steller sea lions. Most examples of this approach involve correlations between catches of pollock or other groundfish and indices of Steller sea lion populations (Loughlin and Merrick, 1989; Alverson, 1992; Trites and Larkin, 1992; Ferrero and Fritz, 1994; Sampson, 1995). The question being asked is whether the removal of fish biomass by a fishery reduces the availability of prey for Steller sea lions to the extent that the condition and vital rates of sea lions are compromised and population abundance (as measured on nearby sites) is significantly affected. This approach is confounded since the amount of prey available is rarely known in the areas where sea lions forage, and measures of harvest or total biomass for larger areas (i.e., total biomass in the BSAI region) may or may not be good indicators of prey availability(Hennen, 2003 Symposium). Results of these studies have been equivocal.

The third approach, used by NOAA Fisheries in both the FMP BiOp and in the 2001 BiOp involves analysis of the extent of overlap between sea lion food habits and fisheries in the following criteria which stem from the 7 questions discussed in section II(B) of this supplement :

- the species and size of fish targeted,
- the depths utilized by sea lions and fisheries,
- the season of the year that the species is fed upon by sea lions and fished for,
- the areas where sea lions forage eat it and fisheries operate fish for it, and
- the potential for concentrated removals by fisheries that could create localized depletions of sea lion prey.

This is a sequential, or hierarchical analysis, which first requires an analysis of Steller sea lion food habits to see which species are both eaten by sea lions (at greater than some threshold level) and targeted by fisheries. If a 10% frequency of occurrence threshold in scat samples is used (NOAA Fisheries, 2000), then federally-managed groundfish fisheries for walleye pollock, Pacific cod, Atka mackerel, and arrowtooth flounder, and state-managed fisheries for Pacific herring and salmon have the potential to compete with Steller sea lions (Sinclair and Zeppelin, 2002).

Fisheries generally remove intermediate to large-sized individuals of a target species. Available data indicate that sea lions consume fish, including the six species noted above, of a wide range of sizes that overlaps with those taken by commercial fisheries (Pitcher, 1981; Loughlin and Nelson, 1986; Frost and Lowry, 1986; Calkins and Goodwin, 1988; Lowry et al., 1989; Fritz et al., 1995; Merrick and Calkins, 1996). Fritz et al (1995) noted that the distribution of sizes of pollock consumed by sea lions matched the distribution of sizes of pollock in the population when the food-habits studies were conducted, suggesting that little selection for size by sea lions occurred. Merrick and Calkins (1996) found that pollock consumed by juvenile sea lions were smaller than those consumed by adults. In their study, smaller sea lions were feeding heavily on the 1984 cohort of pollock, which was present in far greater abundance than the 1982 or 1983 cohorts. Thus, the selection of pollock as reported in Merrick and Calkins (1996) appears to have been determined largely by the availability of the 1984 cohort, and may not be a reliable indicator of preference by juvenile sea lions. Furthermore, while Merrick and Calkins (1996) reported that 93% of the pollock consumed by seven juvenile sea lions were smaller than 30 cm fork length, they also reported that half of the pollock mass the juveniles consumed came from fish longer than 30 cm. Information on the sizes of cod consumed by sea lions also suggests overlap with fisheries, since most (65-100% depending on the area) were greater than 35 cm in length (E. H. Sinclair, personal communication, unpublished NOAA Fisheries data). Less is known about sizes of Atka mackerel and Pacific herring consumed, but these species do not get as large as pollock, Pacific cod, arrowtooth flounder or salmon, so there is likely extensive size overlap with fisheries.

Similarly, most of the fishing for these six species occurs in waters less than 200 m deep on the continental shelf. Diving depths summarized in Merrick and Loughlin (1997) indicate that the sea lions rarely dove to more than 250 m, with most of the dives less than 50 m, but Swain and Calkins (1997) documented regular diving of juveniles to 150-250 m. Therefore, on the basis of depths utilized by sea lions and these fisheries, NOAA Fisheries (2000, 2001) argued that there is the potential for competitive overlap.

Determination of the spatial and temporal overlap of fisheries and sea lions is an area of active research. To date, overlap has been primarily determined by considering the amount and proportions of catch from designated sea lion critical habitat (Fritz, 1995; NOAA Fisheries, 1998). However, more sophisticated modeling (by Dr. I. Boyd at University of St. Andrews, Dr. S. Hinckley, at NOAA Fisheries-AFSC, and Ms. K. Call, at AFSC, NMML) and GIS (Dr. A. Trites and E. Gregr, University of British Columbia) approaches are currently being pursued.

While fisheries may overlap spatially and temporally with sea lions, the magnitude and type of interactions, and their effect on sea lions, has been the subject of considerable debate (NRC, 2003). However, the potential for fisheries to reduce local abundances of sea lion prey has been documented (Fritz, 1995; NOAA Fisheries, 1998). In 16 of 37 local-scale (10s to 100s of nm2) fisheries for Atka mackerel examined, significant ($p<0.05$) declines in fishery catch-per-unit effort (CPUE) were noted over the course of fisheries lasting days to weeks. Catches in fisheries that had significant short-term CPUE declines were generally larger than those without them. Local harvest rates of Atka mackerel in areas with significant CPUE declines ranged between 41-94%, many times higher than the annual 10-15% target harvest rates on the Atka mackerel stock as a whole (NOAA Fisheries, 1998). Seasonal harvest rates of pollock in portions of critical habitat in the eastern Bering Sea may also be considerably greater than target annual rates (Fritz, 1995; NOAA Fisheries, 1998; Table III-7). While the possible magnitude and efficiency of fish removals was described in these studies, the link to linking them with specific responses in Steller sea lion foraging success, and ultimately vital rates, has been elusive.

Effects of fishing on the foraging success of sea lions - zonal discussion

For this supplement, NOAA Fisheries has chosen to look at the effects of fisheries on sea lions based on four zones described in Table II-9 and discussed above. It is NOAA Fisheries' opinion that appropriate protection of these zones is sufficient to avoid jeopardy. Throughout this supplement, NOAA Fisheries has provided a wide variety of information on fisheries and sea lion foraging habits - we will use that information in this discussion, yet will focus on these zones in particular in order to simplify the complex set of management measures and concerns. For example, in Table IV-1 we provide effects in the 0-3 nm area as well as the 0-10 nm area. This seems redundant, however it is important because the first three miles has significance with regard to disturbance of rookery and haulout sites, whereas it is more appropriate to look at effects of nutritional stress in the 0-10 nm range. Regardless, all of this information will be qualitatively considered when making a final determination with the following zonal discussion used as a central component, but not the only consideration.

0-10 nm zone

In Table II-9 the 0-10 nm zone was rated as a high concern for possible interactions between commercial fisheries for pollock, Pacific cod, and Atka mackerel and the western DPS of Steller sea lions. This was based primarily on data from satellite telemetry which indicates that sea lions spend the majority of their time in this zone (e.g., 87% for juveniles in summer and 68% in winter) which is considered to be related to foraging effort. This zone is almost entirely shelf habitat which provides a wide variety of prey resources, spawning aggregations, and dense prey patches. It has also been an area of high production for fisheries, and is a desirable place to fish due to its proximity to ports, safer waters, and productive fishing grounds. The combination of these factors make this area especially susceptible to disturbance.

NOAA Fisheries approach to protection in this zone was to implement 100% closures inside 0-3 nm to provide the maximum protection from disturbance and other harassment near rookeries and haulouts. This goal was nearly reached, with the exception of GOA hook-&-line and pot fisheries for Pacific cod (Table IV-1). Although these cells were colored red in the table due to NOAA Fisheries concern for this zone and only about 58% closures, it is mitigated to some extent by the gear type (i.e., likely lower impact than trawl), and it is a fishery for Pacific cod which is primarily a prey item in the winter for sea lions and less so than in the summer.

Looking at the entire 0-10 nm zone from the perspective of competition with fisheries, the guideline was 75% closures which was generally reached except for the GOA hook-&-line and pot fisheries for Pacific cod (Table IV-1). Also, Pacific cod fishery closures for the BSAI were somewhat below the goal (between 57% - 93%). Again, trawl closures for cod in the EBS were 93%, one of the most important fisheries to exclude from near shore habitat. Given that the other fisheries below the guideline were non-trawl fisheries, the combination of effects is considered to be sufficient to meet the guideline when considering total catch amounts.

In general, the protection levels in this zone have increased from the requirements of the RPA from the FMP BiOp. In the FMP BiOp, 65% of the 0-10 nm zone would have been closed to all three fisheries. Under the 2001 measures, BSAI and GOA pollock fisheries are 91% closed, Atka mackerel is 85% closed, and Pacific cod is closed 76% for trawl and 48% for pot and hook-&-line gears (Tables I-11 and I-12). Catch amounts in 0-10 was mixed; for EBS pollock catch was up over 250% in 0-10 yet amounted to very little of the total catch amount (Table IV-1), catch for pollock in the GOA and for Atka mackerel were all substantially down (green). Pacific cod was mixed as well but generally had reductions in catch in the 0-10 nm zone (Table IV-1). In summary, protection measures were substantially improved in the 0-10 nm zone over what would have been required in the RPA from the FMP BiOp, and also improved over what occured under the 1999 fishery which resulted in jeopardy and adverse modification (NOAA Fisheries, 2000). Again, this was intentional due to the increased emphasis on protection of this area due to the conclusion by NOAA Fisheries that sea lions use nearshore areas (i.e., 0-10 nm) much more than offshore areas.

10-20 nm zone

In Table II-9 the 10-20 nm zone was rated as low to moderate concern for possible interactions between commercial fisheries for pollock, Pacific cod, and Atka mackerel and the western DPS of Steller sea lions. This was based primarily on data from dive filtered satellite telemetry which indicates that sea lions spend relatively less time in this zone (e.g., 7% for juveniles in summer and 22% in winter) which is considered to be related to foraging effort. This zone is mostly shelf habitat (except in the Aleutians which has a very narrow shelf in many places) which provides a wide variety of prey resources, spawning aggregations, and dense prey patches. Because it is a larger area than 0-10 nm (due to the dimensions of the circles) it has a higher amount of biomass expected to be in there (see Tables III-7(a-f)). It has also been an area of high production for fisheries, and is a relatively desirable place to fish due to the productivity of the fishing grounds. However, many vessels, especially the smaller ones, are less safe in this region than closer to shore. The combination of these factors make this area somewhat susceptible to disturbance, yet the effect should be mitigated to some extent by the low frequency of use by sea lions.

NOAA Fisheries approach to protection in this zone was to implement substantial closures, especially for trawl fisheries, of about 50% of the 10-20 nm zone. The goal was to substantially reduce the likelihood of the fishery causing localized depletions or changes in prey patches that would be large enough to cause sea lions to have unsuccessful foraging trips. This goal was nearly reached, with the exception of Aleutian Islands Pacific cod fishing which was closed between 4-18%, and GOA hook-&-line and pot fisheries for Pacific cod which were closed between 16-27% (Table IV-1). The GOA fisheries were colored red due to the higher frequency of occurrence of Pacific cod in sea lion diet in the winter in the GOA (Table 4.5a FMP BiOp; Sinclair and Zeppelin, 2002) while the Aleutian Islands Pacific cod fisheries were colored yellow due to a greater reliance on Atka mackerel in this area and reduced catch rates in critical habitat (Table IV-1).

In general, the protection levels in this zone are roughly equivalent to the requirements of the RPA from the FMP BiOp. In the FMP BiOp, 64% of the 10-20 nm zone would have been closed to all three fisheries. Under the 2001 measures, BSAI and GOA pollock fisheries are 69% closed, Atka mackerel is 66% closed, and Pacific cod is closed 36% for trawl and 31% for pot and 21% for hook-&-line gears (Tables I-11 and I-12). Catch amounts in 10-20 nm were mixed; increases were noted for GOA Pacific cod trawl (12%) and pot (127%); also for BSAI pollock (255%), Pacific cod trawl (25%) and Atka mackerel trawl (11%) (Table III-4, IV-1). In summary, protection measures were mixed in the 10-20 nm zone with substantial areas which were closed (no competitive interactions) with some areas which actually had increases in catch rates over what was observed in 1999. This was expected due to the reduction in pollock closure zones in the BSAI (i.e., 20 nm reduced to 10 nm in many areas) and the overall objective of protecting more inshore areas. By closing those inshore areas, it was presumed that some of that catch would be displaced into the 10-20 nm zone and that is what appears to have happened based on the data.

In the 10-20 nm zone, given the substantial closures yet the increase in catch rates, the best approach to evaluating whether there would be effects on the prey field would be to look at individual areas of high and low intensity of catches.

>20 nm in critical habitat

In Table II-9 the >20 nm zone was rated as a low concern for possible interactions between commercial fisheries for pollock, Pacific cod, and Atka mackerel and the western DPS of Steller sea lions. This was based primarily on data from dive filtered satellite telemetry which indicates that sea lions spend little time in this zone (e.g., 3% for juveniles in summer and 8% in winter) which is considered to be related to foraging effort. This zone is mostly shelf habitat which provides a wide variety of prey resources, spawning aggregations, and dense prey patches which is why these critical habitat foraging areas were listed in the first place (i.e., due to the prey resources available not necessarily use by sea lions). Because they are relatively large continuous areas they have a higher amount of biomass expected to be in there (see Tables III-7(a-f)). It has also been an area of high production for fisheries (e.g., pollock in the EBS), and is a relatively desirable place to fish due to the productivity of the fishing grounds. However, many vessels, especially the smaller ones, are less safe in this region than closer to shore. The combination of these factors make this area somewhat susceptible to disturbance, yet the effect should be mitigated to some extent given the low frequency of use by sea lions.

NOAA Fisheries approach to protection in this zone was to allow all fisheries to operate with no closures yet have seasonal restrictions in order to protect against localized depletions and fishing during the sensitive winter time period. All areas were listed as green, meeting the limited requirement of having a seasonal dispersion element; otherwise unlimited fishing potential for the fisheries. In general, catch amounts in the foraging areas were roughly equivalent to catch in 1999 (Figure III-3).

Outside critical habitat

No restrictions were implemented outside of critical habitat beyond the seasonal restrictions which were placed on fisheries operating in all areas such as seasonal dispersement and winter closures (Table IV-1). This area was rated as low importance (Table I-9) and has little potential for competitive interactions as these areas generally lie off the shelf and therefore would not be as valuable to the fishery. Curiously, sea lions tend to occasionally make long trips out to these areas far offshore, presumably targeting some localized prey resource or sea mount area, however these trips are generally considered to be separated in space from commercial fisheries.

Effects of fishing on the foraging success of sea lions - synthesis and discussion

The goal of the RPA from the FMP BiOp was to change fishery patterns such that sea lions would not be affected to such an extent as to reduce their survival and recovery. The Court made the following statement in its Order (page 32-33):

> "However, there is no analysis of how the newly opened fishing areas will impact the "most important foraging zones." 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." p 32-33

In essence, in this supplement NOAA Fisheries has determined that it is high catch rates in the 0-10 nm zone which has the potential to adversely affect Steller sea lions and was the cause of jeopardy to Steller sea lions. By largely closing 0-10 nm, seasonal dispersion elements, and implementing other fishery specific measures (e.g., platoons) the fishery can proceed while successfully avoiding substantial adverse effects. It is also NOAA Fisheries's determination that it is unreasonable to conclude that limited fishing in the 10-20 nm zone is sufficient to cause substantial adverse effects. Given that the evidence for nutritional stress is limited and mostly circumstantial, fishery interactions at the margins (i.e., areas of limited overlap both spatially and temporally) would likely have only a marginal effect on Steller sea lions. Further, when reviewing the global and regional biomass available to sea lions (Tables III-7(a-f)), the forage ratio by region (Table III-8) and the underlying trend rates by region (Table I-1) it does not support the hypothesis that sea lions are being substantially affected by a global (i.e., area wide) reduction in biomass of key prey species due to fisheries.

As discussed above, protection in the nearshore areas are actually superior to those proposed in the RPA from the FMP BiOp. NOAA Fisheries has looked at the changes in catch rates (Tables III-7(a-f)), seasonal dispersion (III-4,5, and 6), and the amount of fishing which was actually displaced by the 2001 conservation measures (Table III-6). In some cases little changed, or actually resulted in increases in catch in critical habitat such as in the EBS pollock fishery. In this case, large closure areas, seasonal restrictions, and critical habitat catch limits were already in place. Therefore, looking for further closures in the 2001 measures is inappropriate. In going back to the Court's comment above, the question then becomes, why did NOAA Fisheries include both the pollock and Atka mackerel fisheries in the RPA from the FMP BiOp if large conservation measures were already in place? This was partly due to the fact that NOAA Fisheries found that the control rule was not sufficiently protective (i.e., Global Control Rule), and that NOAA Fisheries determined that an adaptive management program was necessary in order to determine if closures were effective in eliminating jeopardy. As part of that adaptive management program (i.e., the open/closed, red/green areas) NOAA Fisheries completely re-drew all of the previous closure areas which were in place in 1999. This included opening fishing all the way to within 3 nm of rookeries and haulouts in order to determine if those meta-populations would be adversely affected by locally intense fisheries. As a fallout from that consultation and the RPA, a very large amount of research funding was provided by the U.S. Congress in order to investigate the effects of fishing on sea lions and the causes of the decline. Based on this expanded research effort, the specific fishery interaction studies underway, and recommendations by the Council's RPA committee NOAA Fisheries concluded in 2001 (2001 BiOp) that the adaptive management approach was no longer a necessary component of a conservation package in order to avoid jeopardy and adverse modification of critical habitat.

Population level response to competition with fisheries

Steller sea lions are expected to continue to decline in the near future with some regions beginning to recover if the last survey is a predictor. However, continued declines in pup production do not support a prediction of recovery in the next few years. Conservation measures have been implemented incrementally since 1991 (i.e., trawl closures around rookeries, etc.), and yet the population has continued to decline at a nearly constant rate until 2002. In part this may be due to our inability to detect a small change in the population trajectory. It is expected that NOAA Fisheries would not be able to detect an annual change of 1% until about 6-8 years from the time of the change (NOAA Fisheries, 2000). Given the projected continued decline of the species, and our inability to detect changes in population trajectory quickly, it is reasonably likely that the western population of Steller sea lions will experience reductions in reproduction, numbers, and distribution in response to the proposed action and those effects described in the Baseline (NOAA Fisheries, 2001) and Cumulative Effects (NOAA Fisheries, 2001). As described in the Baseline, the effects of massive foreign fisheries, intentional shooting of thousands of Steller sea lions, incidental catch of thousands of sea lions, historic harvest of pups, and the seemingly constant environmental change from regime shifts to ENSO, creates such a dynamic environment that is extremely difficult to understand and predict how those effects may have, or are, affecting the Steller sea lion population (NRC, 2003).

Given that the eastern population of Steller sea lions is increasing and appears to be robust, it is unlikely that it will experience reductions in reproduction, numbers, and distribution in response to the proposed action.

Expected impacts to their survival and recovery in the wild

The final step is to determine if any reduction in a species' reproduction, numbers, or distribution (identified in the second step of our analysis above) can be expected to appreciably reduce a listed species' likelihood of surviving and recovering in the wild. Since these reductions are not expected for the eastern population, it is unlikely that the eastern population would not survive and recover in the wild.

When looking at the baseline effects due to predation by killer whales and adverse effects on the species' environment due to climate change, NOAA Fisheries concludes that this proposed action is not likely to appreciably reduce the western population of Steller sea lions' likelihood of surviving and recovering in the wild.

In summary, NOAA Fisheries has determined that the proposed action will successfully avoid negative interactions with Steller sea lions in the areas and times most important to the key age classes in the population. Some level of competitive interaction is likely in the zones from 10 nm and beyond, however these areas are not used as extensively by sea lions as those zones closer to shore (i.e., 0-10 nm). Additionally, animals foraging beyond 10 nm are likely to be older juveniles or adults which have advanced diving and foraging abilities (i.e., the older the animal the more advanced their abilities are likely to be). This action is nearly as protective as the scenario proposed by the RPA from the FMP biological opinion, with some changes in the approach and the underlying scientific information. In all likelihood however, this species may continue to decline for some time due to adverse environmental factors (e.g., environmental change, predation). Regardless, NOAA Fisheries is aggressively pursuing research into the root causes of the decline along with a host of other organizations and individuals (see Symposium 2003).

D. Adverse Modification of Critical Habitat

As discussed in the Status of the Species chapter of the 2001 BiOp (section 3), the area that is designated as critical habitat was determined using information on the life history patterns of Steller sea lions, particularly land sites where sea lions haul out to rest, pup, nurse their pups, mate, and molt. The area that is designated as critical habitat for Steller sea lions was also designed to include the primary foraging areas for Steller sea lions during periods of their annual life cycle that are critical to their reproduction: the areas used by adult females during the latter stages of pregnancy and when they are weaning pups; the areas used by pups when they begin to feed independently; and the areas used by juvenile sea lions. As such, the critical habitat that has been designated for Steller sea lions was designed to protect the prey base around sea lion rookeries and haulouts that is necessary for adult, female sea lions to survive and successfully reproduce and for juvenile sea lions to survive.

The value of the marine portions of critical habitat that has been designated for Steller sea lions will be determined by the abundance and distribution of prey species. The abundance of prey within these foraging areas, over time, would determine the number of predators they could support in that time; as the abundance increased, the area would be able to support more predators, as the abundance decreased, the area would be able to support fewer predators. Similarly, the distribution of prey species will determine whether prey are available to foraging sea lions and will determine whether they can forage successfully. Factors that would determine an area's value to predators like Steller sea lions include the distance of prey from shore, the depth of prey in the water column, the distribution and abundance of prey, and the dispersal of prey over time and space.

In the Environmental Baseline chapter of the 2001 BiOp (section 4), we used the term "environmental carrying capacity" (the relationship between the distribution and abundance of prey and the number of predators an area could support at a particular time) to represent the value of critical habitat for Steller sea lions. Even without the presence of humans, other species compete with Steller sea lions for food in their designated critical habitat. Adult walleye pollock, arrowtooth flounder, Pacific cod, northern fur seals, spotted seals, harbor seals, and numerous species of seabirds compete for small pollock in the action area; harbor seals compete with sea lions for larger pollock; orcas, humpback whales, gulls, and pinnipeds compete with sea lions for species like herring and capelin; and there are similar competitive interactions for species like salmon, rockfish, and sablefish.

The forage ratio approach provides some very general guidance - at the largest geographic scale and at the population level - regarding whether the FMP allows for sufficient biomass to support the current population of Steller sea lions (Table III-8). This approach may even be useful as a benchmark to which proposed management actions could be compared in a gross sense. However, NMML has recommended that this approach only be used to compare management actions at a spatial scale equal to or larger than the smallest unit for which the necessary fishery information can be estimated (e.g., Gulf of Alaska, Bering Sea, and Aleutian Islands). In this case, there may be more concern for fisheries impacts in the Aleutian Islands and Gulf of Alaska, where biomass ratios are below the theoretical level necessary for successful foraging.

In the 2001 BiOp, NOAA Fisheries explored two different methods for evaluating whether adverse modification of critical habitat would occur as a result of the proposed action. First, NOAA Fisheries evaluated whether a ratio of forage available to forage consumed could be used as a metric to determine whether there is adequate forage for Steller sea lions in a theoretically pristine environment (Table III-8). The analysis provided some interesting results. Although the overall biomass in critical habitat for pollock, Pacific cod, and Atka mackerel for the combined BSAI and GOA was at a scale far beyond what Steller sea lions may need to successfully forage, the area specific analysis showed something quite different. The ratio of forage available to forage consumed was only 11 in the Aleutian Islands and 17 in the Gulf of Alaska, as compared to a theoretical ratio of 22-46 (Table III-8). The ratio in the Bering Sea was much higher at 446, well above the expected needs of Steller sea lions. Interestingly enough, the sea lion population in the vicinity of the Bering Sea is nearly stable while sea lion populations in the eastern GOA and Aleutian Islands have experienced dramatic declines since 1991 (Table I-2; Loughlin and York, 2000) . However, numerous difficulties arise when trying to interpret this information, as described in section 5.3.3 of the 2001 BiOp. Because of these complications, the forage ratio approach does not allow analysis of the spatial or temporal scales of interest to a foraging Steller sea lion as described in Bowen *et al.* (2001).

For this supplement, NOAA Fisheries developed Tables III-7(a-f) which describe the amount of biomass of each fish species by management area and zone (e.g., 0-10 nm, 10-20 nm, foraging area beyond 20 nm, total critical habitat). For both 1999 and 2002, the catch in that area is listed, as well as the amount of fish biomass, the catch rate, and the biomass remaining for sea lions and other predators. The objective was to compare the local catch rate to the wide-area, annual catch rate. For areas of concern (i.e., 0-10 nm and 10-20 nm) we compared the local rate to the wide-area, annual catch rate with the expectation that the closure areas, seasonal dispersion, and other measures would reduce the local that catch rate to well below that of the wide-area, annual catch rate. Given that the annual rate is derived via the Global Control Rule, and is considered to be a safe level, it then follows that if the harvest rates are substantially less than this amount in each of the smaller, local levels, than it is likely that there would not be substantial adverse effects on the prey field.

For example, if we take GOA pollock (Table III-7a), the wide-area, annual catch rate was 14.1% in 1999 which was reduced to 7.9% in 2002. This reduction in catch rate was not an effect of conservation measures, but of a reduced catch level due to concern about the continued decline of this fish stock. This does illustrate that the ecosystem is very dynamic in the BSAI and GOA and even though we implement conservation measures, large scale changes can occur in the natural environment which may completely overshadow any of our actions. Just taking 2002, the catch rate in 0-10 nm in the winter (upper left hand block) was 0.4% - extremely low especially when compared to the annual rate of 7.9%. However, if we factor that this rate was only for half of the year, a true comparison would be to multiply the 0.4% by 2 in order to have the same time period (denominator of 1 year instead of 6 months), such that we now compare a catch rate of 0.8% to 7.9% and again the rate in the 0-10 nm zone is still much lower. This shows that the catch is extremely low in 0-10 nm, which was much lower than in 1999 as well (i.e., 4.8% or 9.6% annually) for that area. Based on this sensitive time of year, for the number one prey item for sea lions, the likelihood of adverse effects to the prey field would be very low, and certainly much lower than in 1999.

These tables were summarized in Table IV-1, and rated with colors to show the general concern for each zone. Most cells were green indicating that the catch rates were low and that the biomass remaining was relatively high. The exception was the EBS pollock fishery which was mostly rated as red indicating that catch rates had increased in most areas. The catch rate increased from 9.1% in 1999 to 13.3% in 2002 due primarily to an increase in total catch (i.e., total biomass remained the same). Consequently, catch rates from 1999 - 2002 increased in nearly every zone. Looking at the most sensitive areas first, rates increased slightly in the 0-10 nm zone which was due to increased catch near the St. George Island sea lions sites which only had 3 nm closure zones. Although these rates don't appear large, the actual catch amounts in a relatively small area were quite large; over 30,000 mt in critical habitat around St. George Island which is over a half year of catch in all of the GOA concentrated in one relatively small area in the EBS (Table III-9). Due to all other areas in the EBS being closed to pollock fishing within 0-10 nm, these areas were not of concern and hence the yellow rating in Table IV-1. In the 10-20 nm zone, rates were up substantially; from 0.9% to 4.7% in the winter, 2.3% to 13% in the summer, and from 2.4% to 12.3% on an annual basis in 10-20 nm. In the summer (13% converted to 26% on an annual basis) the rate represents double the annual catch rate of 13.3%. Catch in the foraging area beyond 20 nm was 11% in the winter and 24% in the summer which was over 3 times the annual catch rate. In critical habitat overall, winter rates were 6.6% which is just about equal to the annual rate, while the summer was 15.1% (more than double the annual rate).

In summary for EBS pollock, catch rates are relatively high in critical habitat areas beyond 10 nm. Inside 10 nm conservation measures are very conservative except for catch off St. George Island. However, in the RPA from the FMP BiOp a large area would have been left open to within 3 nm of shore (see Figure 9.1a in NOAA Fisheries, 2000) which would have resulted in large catch amounts within the 0-10 nm zone. Therefore, it is likely that the 2001 conservation measures are actually more protective than the RPA would have been in 0-10 but that is difficult to say with any accuracy as fishermen always have the choice to fish farther offshore; so predicting catch is inherently inaccurate. When we look at the amount of biomass left behind (i.e., what would be important for a foraging Steller sea lion), we see that for example, in the summer, 848 thousand metric tons (tmt) of pollock was left behind in the foraging area in 2002 compared to 1,024 tmt in 1999 even though the catch rate nearly tripled (Table III-7c). For comparison, in all areas of the GOA, there were only 657 tmt of pollock in 2002. Further, the population counts in this area were down only 6.5% from 1991 - 2002, and were up 2.9% from 2000 - 2002; it has been one of the most stable areas in the western DPS over the last decade. When looking at the global availability of pollock in the EBS, the forage ratio is about 446 (all three species), far above what we think is necessary to sea lions on a local level.

Pacific cod was rated as yellow due to very little change in catch rates beyond 10 nm (Table III-7d). Inside 10 nm there were decreases in catch rates; in the winter the rate dropped from 8.4% to 4.4% and in the summer from 2.2% to 1.7%. The lack of a decrease in the 10-20 nm area was not unexpected due to the lack of substantial closures in this zone of critical habitat. The Aleutian Islands Atka mackerel fishery was similar with low catch rates in 0-10 nm and slightly higher rates similar to the annual rate within the 10-20 nm zone (Table III-7e).

Table III-7f is a summary of all three fish species in all areas. This is related to Table III-8 which provides the foraging ratio of biomass to sea lion consumption. The table is somewhat dominated by EBS pollock which has such a large estimated biomass compared to other species and areas. In general catch rates were reduced in the 0-10 nm and were far lower than the annual catch rate indicating that the fishery would be unlikely to adversely modify the prey field for Steller sea lions. Catch rates increase in the 10-20 nm zone but are still largely at or below the annual rate; the exception is the summer period when the rate rises to 9.7% which is just above the annual rate. However, this is a time of year when other species that sea lions rely on are available such as herring and salmon, it is also the season of less concern for sea lions and nutritional stress based on research of pups and lactating females on rookeries in the summer time. Catch rates in the foraging areas were high, roughly double the rate in the winter and triple in the summer. Again, looking at the relative low concern for this area based on sea lion usage (Table II-9), and the large amount of biomass remaining (Table III-7f), overall we would predict there to be only limited adverse effects to the prey field under the 2001 conservation measures.

The effects described above indicate that the fisheries as proposed, are not likely to reduce the abundance of prey within local foraging areas and alter the distribution of groundfish prey in ways that could reasonably be expected to appreciably reduce the foraging effectiveness of sea lions, therefore, it would not reduce the likelihood of their survival and successful reproduction nor their likelihood of recovery in the wild.

E. Conclusions

The analysis in the preceding sections of this biological opinion forms the basis for conclusions as to whether the proposed action, the ongoing fisheries for Pacific cod, Atka makerel, and pollock in the BSAI and GOA as modified by amendments 61/61 and 70/70 satisfy the standards of ESA Section 7(a)(2). To do so, the action agency must ensure that their proposed action is not likely to jeopardize the continued existence of any listed species or destroy or adversely modify the designated critical habitat of such species. Section 3 of the 2001 BiOp defines the biological requirements of the two populations of listed Steller sea lions. Section 4 of the 2001 BiOp evaluates the relevance of the environmental baseline to the status of Steller sea lions. Section 5 of the 2001 BiOp details the likely effects of the proposed action, both on individuals of the species in the action area and on the listed population as a whole, across its range and life cycle. Section 6 of the 2001 BiOp considers the cumulative effects of relevant non-Federal actions reasonably certain to occur within the action area. This supplement further explores the rationale of the 2001 BiOp, the telemetry information and the performance of the fisheries in relation to the requirements in order to remove jeopardy and adverse modification found in the FMP BiOp. On the basis of this information and analysis (2001 BiOp and the supplement), NOAA Fisheries draws it conclusions about the effects of the pollock, Pacific cod, and Atka mackerel fisheries on the survival and recovery of the two listed populations of Steller sea lions.

In this section NOAA Fisheries must determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed action, the environmental baseline, and cumulative effects. The information available to NOAA Fisheries is both quantitative and qualitative. For Steller sea lions, although significant research has been funded over the past few years and new information is being developed on the habitat requirements of the species, as well as various reviews (e.g., Bowen et. al., 2001; NRC, 2003) the cause of the current decline of the species is still unknown. NOAA Fisheries expects that over the next 3-5 years a significant amount of new information will be available for future decision making, however, much of the available information today is based on the professional judgement of knowledgeable scientists. Despite an increasing trend toward a more quantitative understanding of the habitat requirements of Steller sea lions, critical uncertainties limit NOAA Fisheries' ability to project future conditions and effects. As a result, no hard and fast numerical indices are available for any of these stocks on which NOAA Fisheries can base determinations about jeopardy or the adverse modification of critical habitat (Section 7(a)(2) standards). Ultimately, NOAA Fisheries' conclusions are qualitative judgments based on the best quantitative and qualitative information available for Steller sea lions.

Western Population of Steller Sea Lions

After reviewing the current status of the endangered western population of Steller sea lions, the environmental baseline for the action area, the proposed action for Alaska Groundfish in the Bering Sea and Aleutian Islands and Gulf of Alaska, and the cumulative effects, it is NOAA Fisheries' biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the western population of Steller sea lions.

After reviewing the current status of critical habitat that has been designated for the western population of Steller sea lions, the environmental baseline for the action area, the proposed action for Alaska Groundfish in the Bering Sea and Aleutian Islands and Gulf of Alaska, and the cumulative effects, it is NOAA Fisheries' biological opinion that the action, as proposed, is not likely to adversely modify its designated critical habitat.

Eastern Population of Steller Sea lions

After reviewing the current status of the threatened eastern population of Steller sea lions, the environmental baseline for the action area, the proposed action for Alaska Groundfish in the Bering Sea and Aleutian Islands and Gulf of Alaska, and the cumulative effects, it is NOAA Fisheries' biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the eastern population of Steller sea lions.

After reviewing the current status of critical habitat that has been designated for the eastern population of Steller sea lions, the environmental baseline for the action area, the proposed action for Alaska Groundfish in the Bering Sea and Aleutian Islands and Gulf of Alaska, and the cumulative effects, it is NOAA Fisheries' biological opinion that the action, as proposed, is not likely to adversely modify its designated critical habitat.

V. Literature Cited

Alaska Department of Fish and Game and National Marine Fisheries Service. 2001. Satellite telemetry and Steller sea lion research. Prepared for the 2001 Biological Opinion. Unpubl. Manuscript.

Alverson, D. L. 1992. A review of commercial fisheries and the Steller sea lion (Eumetopias jubatus): the conflict arena. Rev. Aquat. Sci. 6:203-256.

Balsiger, J.W. 2003. Memorandum for William T. Hogarth, Assistant Administrator for Fisheries. "Agency Response To The Steller Sea Lion 2001 Biological Opinion Remand Order - Decision Memorandum". January 16, 2003.

Baraff, L. S., and T. R. Loughlin. 2000. Trends and potential interactions between pinnipeds and fisheries of New England and the U.S. west coast. Marine Fisheries Review 62(4):1-39.

Barbeaux, S.J., and M. Dorn. 2003. Spatial and temporal analysis of eastern Bering Sea echo integration-trawl survey and catch data of walleye pollock, *Theragra chalcogramma*, for 2001 and 2002. Unpubl. Manuscript.

Berkson, J.M. and D.P. DeMaster. 1985. Use of pup counts in indexing population changes in pinnipeds. Can. J. Fish. Aquat. Sci. 42(5):873-879.

Braham, H.W., R.D. Everitt, and D.J. Rugh. 1980. Northern sea lion decline in the eastern Aleutian Islands. J. of Wildl. Management 44: 25-33.

Boyd, I.L. 1996. Individual variation in the duration of pregnancy and birth date in Antarctic fur seals: the role of environment, age and sex of fetus. J. Mammal. 77: 124-133.

Boyd, I. L., J. P. Croxall, N. J. Lunn, and K. and Reid. 1995. Population demography of Antarctic fur seals: the costs of reproduction and implications for life histories. J. Anim. Ecol. 64: 505-518.

Bowen, W.D., Harwood, J., Goodman, D., and Swartzman, G.L. 2001. Review of the November 2000 Biological Opinion and Incidental Take Statement with respect to the Western Stock of the Steller sea lion. North Pacific Fishery Management Council.

Burns, J.M., M.J. Rehberg, and J.P. Richmond. 2003. Diving behavior and physiology in juvenile Steller sea lions: what are the links? Talk presented at "Marine Science in the Northeast Pacific: Science for Resource-Dependent Communities", 13-17 January 2003, Anchorage AK. Abstract only.

Calkins, D. G., E. F. Becker, and K. W. Pitcher. 1998. Reduced body size of female Steller sea lions from a declining population in the Gulf of Alaska. Mar. Mamm. Sci. 14:232-244.

Calkins, D. G., and E. Goodwin. 1988. Investigation of the declining sea lion population in the Gulf of Alaska. Unpubl. Rep., Alaska Dep. Fish and Game, 333 Raspberry Road, Anchorage, AK 99518. 76 pp.

Costa, D. P. 1993. The relationship between reproductive and foraging energetics and the evolution of the Pinnipedia. In: I.L. Boyd (ed.), Recent Advances in Marine Mammal Science. Zoological Society of London, Oxford University Press.

Costa, D. P., J. P. Croxall, C. D. Duck. 1989. Foraging energetics of Antarctic Fur Seals in relation to changes in prey availability. Ecology 70:596-606.

DeMaster, D. and S. Atkinson, editors. 2001. Steller sea lion decline: Is it food II. Proceedings of the workshop, Is it food II, Alaska SeaLife Center, Seward, Alaska May 2001. University of Alaska Sea Grant College Program, Fairbanks, AK. (AK-SG-02-02) 78p.

Dorn, M.W., S. Barbeaux, M. Guttormsen, B. Megrey, A. B. Hollowed, E. Brown, and K. Spalinger. 2002. Walleye pollock. *In* Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska. Gulf of Alaska Plan Team, pp. 35-104. (North Pacific Fishery Management Council, 605 W. 4th Avenue, Suite 306, Anchorage, AK 99501)

Estes, J. A., M. T. Tinker, T. M. Williams, and D. F. Doa. 1998. Killer whale predation on sea otters linking oceanic and nearshore ecosystems. Science 282: 473-476.

Ferrero, R.C. and L.W. Fritz. 1994. Comparisons of walleye pollock, *Theragra chalcogramma*, harvest to Steller sea lion, *Eumetopias jubatus*, abundance in the Bering Sea and Gulf of Alaska. U.S. Dep.

of Commer., NOAA Tech. Memo. NOAA Fisheries-AFSC

Fritz, L.W., R.C. Ferrero, and R.J. Berg. 1995. The threatened status of Steller sea lions, *Eumetopias jubatus*, under the Endangered Species Act: Effects on Alaska Groundfish Fisheries Management. Mar. Fish. Rev. 57:14-27.

Fritz, L., and R.C. Ferrero. 1998. Options in Steller sea lion recovery and groundfish fishery management. Biosph. Conserv. 1:7-20.

Fritz, L.W., A. Greig, and R.F. Reuter. 1998. Catch-per-unit-effort, length, and depth distributions of major groundfish and bycatch species in the Bering Sea, Aleutian Islands, and Gulf of Alaska regions based on groundfish fishery observer data. U.S. Dep. Commer., NOAA Tech. Memo. NOAA Fisheries-AFSC

Frost, K. J., and L. F. Lowry. 1986. Sizes of walleye pollock, Theragra chalcogramma, consumed by marine mammals in the Bering Sea. Fish. Bull. 84:192-197.

Hennen, Daniel. 2003. Spatial Coherence and Density Dependence In the Decline of the Steller Sea Lion. Talk presented at "Marine Science in the Northeast Pacific: Science for Resource-Dependent Communities", 13-17 January 2003, Anchorage AK. Abstract only.

Haflinger, K. 2003. An analysis of juvenile foraging telemetry data binned 0-3, 3-10, 10-20 nm, and >20 nm, provided as further comment on the draft supplement. Provided by the NPFMC.

Holmes, E.E., and A.E. York. In Press. Using age structure to detect impacts on threatened populations: a case study using Steller sea lions.

Imler, R. H. and H. R. Sarber. 1947. Harbor seals and sea lions in Alaska. U.S. Dept of the Interior, Fish and Wildlife Service, Spec. Sci. Rep. 28, 23 pp.

Kajimura, H. 1984. Opportunistic feeding of the northern fur seal, Callorhinus ursinus, in the eastern North Pacific Ocean and eastern Bering Sea. U. S. Dept. of Commer., NOAA Tech. Rep. NOAA Fisheries-SSRF -779.

Kenyon, K.W., and D.W. Rice. 1961. Abundance and distribution of the Steller sea lion. J. of Mammal. 42:223-234.

Loughlin, T.R., D.J. Rugh, and C.H. Fiscus. 1984. Northern sea lion distribution. Journal of Wildlife Management 48:729-740.

Loughlin, T. R., and R. Nelson, Jr. 1986. Incidental mortality of northern sea lions in Shelikof Strait, Alaska. Mar. Mamm. Sci. 2:14-33.

Loughlin, T.R. and R.L. Merrick. 1989. Comparison of commercial harvest of walleye pollock and northern sea lion abundance in the Bering Sea and Gulf of Alaska. Proceedings of the International Symposium on the Biological Management of Walleye Pollock.

Loughlin T.R., N. Williamson, R. Methot, and S. Zimmerman. 1992. Marine mammals-fisheries interactions: The Steller sea lion issue. A management and science colloquium, Alaska Region and Fisheries Science Center, June 4, 1992.

Loughlin, T.R., J.T. Sterling, R.L. Merrick, J.L. Sease, and A.E. York. 2003. Immature Steller sea lion diving behavior. Fishery Bulletin.

Loughlin, T.R., and A.E. York. 2000. An accounting of the sources of Steller sea lion, *Eumetopias jubatus*, mortality. Marine Fisheries Review 62(4).

Lowry, L. F., Frost, K. J., Calkins, D. G., Swartzman, G. L., and Hills, S. 1982. "Feeding habits, food requirements, and status of Bering Sea marine mammals." *Document Nos. 19 and 19A*, North Pacific Fishery Management Council, 605 W. 4th Avenue, Suite 306, Anchorage, Alaska 99501-2252. p. 574.

Lowry, L. F., and K. J. Frost. 1985. Biological interactions between marine mammals and commercial fisheries in the Bering Sea. Pages 41-61 in: J. R. Beddington, R. J. H. Beverton, and D. M. Lavigne (eds.), Marine Mammals and Fisheries. George Allen & Unwin, London.

Lowry, L. F., K. J. Frost, and T. R. Loughlin. 1989. Importance of walleye pollock in the diets of marine mammals in the Gulf of Alaska and Bering Sea, and implications for fishery management, Pages

701-726 in: Proceedings of the international symposium on the biology and management of walleye pollock, November 14-16, 1988, Anchorage, AK. Univ. AK Sea Grant Rep. AK-SG-89-01.

Lunn, N. J., and I. L. Boyd. 1993. Influence of maternal characteristics and environmental variation on reproduction in Antarctic fur seals. Symp. Zool. Soc. London 66:115-129.

Malavear, Maria Yolanda Garcia and David Sampson. 2003. Modeling the energetics of Steller sea lions (Eumetopias jubatus) along the Oregon coast. Talk presented at "Marine Science in the Northeast Pacific: Science for Resource-Dependent Communities", 13-17 January 2003, Anchorage AK. Abstract only.

Mathisen, O. A. 1959. "Studies on Steller sea lion (*Eumetopias jubatus*) in Alaska." *Transactions of the North American Wildlife Conference*, 24, pp. 346-356.

Merrick, R. L., and D. G. Calkins. 1996. Importance of juvenile walleye pollock, Theragra chalcogramma, in the diet of Gulf of Alaska Steller sea lions, Eumetopias jubatus. Pages 153-166 in: U.S. Dep. Commer. NOAA Tech. Rep. NOAA Fisheries 126.

Merrick, R.L., T.R. Loughlin, and D.G. Calkins. 1987. Decline in abundance of the northern sea lion, *Eumetopias jubatus*, in 1956-86. Fish. Bull., U.S. 85:351-365.

Merrick, R.L. 1995. The relationship of the foraging ecology of Steller sea lions (*Eumetopias jubatus*) to their population decline in Alaska. Unpubl. Ph.D. dissertation, Univ. of Washington. 171 pp.

Merrick, R.L., and T.R. Loughlin. 1997. Foraging behavior of adult female and young-of-the-year Steller sea lions (*Eumetopias jubatus*) in Alaskan waters. Can. J. of Zool. 75 (5):776-786.

National Research Council (NRC). 1996. The Bering Sea Ecosystem. National Academy press, Washington, D.C. 307 pp.

National Research Council (NRC). 2003. Decline of the Steller sea lion in Alaskan waters: untangling food webs and fishing nets. National Academy press, Washington, D.C. 204 pp.

NOAA Fisheries 1992. Recovery plan for the Steller sea lion (*Eumetopias jubatus*). Prepared by the Steller Sea Lion Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland, 92 pp.

NOAA Fisheries. 1998. Section 7 consultation on the authorization of the Bering Sea and Aleutian Islands groundfish fishery for walleye pollock under the BSAI FMP, on the authorization of the Bering Sea and Aleutian Islands Atka mackerel fishery under the BSAI FMP, and the authorization of the Gulf of Alaska groundfish fishery for walleye pollock under the GOA FMP, between 1999 and 2002. Office of Protected Resources, NOAA Fisheries. Dec. 3, 1998.

NOAA Fisheries. 2000. Section 7 consultation on the authorization of the Bering Sea and Aleutian Islands groundfish fishery under the BSAI FMP and the authorization of the Gulf of Alaska groundfish fishery under the GOA FMP. Office of Protected Resources, NOAA Fisheries. Nov. 30, 2000.

NOAA Fisheries. 2001. Section 7 consultation on the authorization of the 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; 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; and parallel fisheries for pollock, Pacific cod, and Atka mackerel, as authorized by the State of Alaska within 3 nm of shore. Office of Protected Resources, NOAA Fisheries. Oct. 19, 2001.

Perlov, A. S. 1975. The food of sea lions in the vicinity of the Kuril Islands. Ekologia 4: 106-108. (translated by S. Pearson, AFSC).

Pitcher, K. W. 1981. Prey of the Steller sea lion, Eumetopias jubatus, in the Gulf of Alaska. Fish. Bull. U.S. 79:467-472.

Pitcher, K. W. 1990. Major decline in number of harbor seals, Phoca vitulina richardsi, Marine Mammal Science 6:121-134.

Pitcher, K. W., and D. G. Calkins. 1981. Reproductive biology of Steller sea lions in the Gulf of Alaska. J. Mamm. 62:599-605.

Pitcher, K. W., D. G. Calkins, and G. W. Pendleton. 1998. Reproductive performance of female Steller sea lions: an energetics-based reproductive strategy? Canadian Journal of Zoology 76:2075-2083.

Porter, B. 1997. Winter ecology of Steller sea lions (Eumetopias jubatus) in Alaska. M.S. thesis, University of British Columbia, Vancouver, B.C., Canada. 84 p.

Riedman, M. 1990. The pinnipeds: Seals, sea lions and walruses. Univ. California Press, Berkeley, CA. 439 pp.

Rosen, D.A.S. and A.W. Trites. 2000. Pollock and the decline of Steller sea lions: testing the junk-food hypothesis. Canadian Journal of Zoology 78:1243-1258.

Sampson, D. B. 1995. An analysis of groundfish fishing activities near Steller sea lion rookeries in Alaska. Unpubl. Rep., Oregon State University, Coastal Oregon Marine Experiment Station, Hatfield Marine Science Center, Newport, OR. 40 pp.

Sease, J.L and C.J. Gudmondson. 2002. Aerial and land-based surveys of Steller sea lions (Eumetopias jubatus) from the western stock in Alaska, June and July 2001 and 2002. Dep. of Commer., NOAA Tech. Memo. NOAA Fisheries-AFSC

Sease, J.L. and A.E. York. In Press. Seasonal distribution of Steller sea lions at rookeries and haul-out sites in Alaska.

Shimada, A. M., and D. K. Kimura. 1994. Seasonal movements of Pacific cod, *Gadus macrocephalus*, in the eastern Bering Sea and adjacent waters based on tag-recapture data. Fish. Bull., U.S. 92:800-816.

Sinclair, E. H., T. Loughlin, W. Pearcy. 1994. Prey selection by northern fur seals (Callorhinus ursinus) in the eastern Bering Sea. Fish. Bull. 92: 144-156.

Sinclair, E.H. and T.K. Zeppelin. 2002. Seasonal and spatial differences in diet in the western stock of Steller sea lions (Eumetopias jubatus). Journal of Mammalogy 83(4):973-990

Swain, U. G., and D. G. Calkins. 1997. Foraging behavior of juvenile Steller sea lions in the northeastern Gulf of Alaska: diving and foraging trip duration. Pages 91-106 in: Steller sea lion recovery investigations in Alaska, 1995-1996. Rep from AK. Dep. Fish and Game, Juneau, AK to NOAA, Contract No. NA57FX0256.

Thorsteinson, F. V., and C. J. Lensink. 1962. Biological observations of Steller sea lions taken during an experimental harvest. J. Wildl. Mgmt. 26:353-359.

Trillmich, F., and K. Ono (Editors). 1991. Pinnipeds and El Nino: Responses to environmental stress. Springer-Verlag, Berlin.

Trites, A. W., and P. A. Larkin. 1992. The status of Steller sea lion populations and the development of fisheries in the Gulf of Alaska and Aleutian Islands. Rep. contract NA17FD0177 to Pacific States Marine Fisheries Commission, Gladstone, OR. 134pp.

Trites, A.W., and P.A. Larkin. 1996. Changes in the abundance of Steller sea lions (*Eumetopias jubatus*) in Alaska from 1956 to 1992: how many were there? Aquat. Mamm. 22:153-166.

Trites, A.W., D.G. Calkins, and A.J. Winship. 2003. Diets of Steller sea lions in southeast Alaska. Talk presented at "Marine Science in the Northeast Pacific: Science for Resource-Dependent Communities", 13-17 January 2003, Anchorage AK. Abstract only.

Trites, A. W. and C. P. Donnelly. 2003. The decline of Steller sea lions Eumetopias jubatus in Alaska: a review of the nutritional stress hypothesis. Mammal Rev. 33(1): 3-28.

Wilson C.D., A.B. Hollowed, M. Shima, P. Walline, and S. Stienessen. In Review. Interactions between commercial fishing and walleye pollock.

Winship, A. J. 2000. Growth and Bioenergetic Models for Steller Sea Lions (Eumetopias jubatus) in Alaska. Masters Thesis, University of British Columbia. 160 p.

Winship, A.J, A.W. Trites, and D.A.S. Rosen. 2002. A bioenergetic model for estimating the food requirements of Steller sea lions (Eumetopias jubatus) in Alaska, USA. Marine Ecology Progress Series 229:291-312.

Winship, A.J, and A.W. Trites. 2003. Prey consumption of Steller sea lions (Eumetopias jubatus) off Alaska: how much prey do they require? Fishery Bulletin 101:147-167.

York, A.E. 1994. The population dynamics of the northern sea lions, 1975-85. Mar. Mamm. Sci. 10:38-51.

York, A.E., R.L. Merrick, and T.R. Loughlin. 1996. An analysis of the Steller sea lion metapopulation in Alaska. Pp. 259-292 in D.R. McCullough (ed.), Metapopulations and Wildlife Conservation, Island Press, Washington, D.C.

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).

Year	Gulf of Alaska Eastern (n=10)	Gulf of Alaska Central (n=15)	Gulf of Alaska Western (n=9)	Aleutian Islands Eastern (n=11)	Aleutian Islands Central (n=35)	Aleutian Islands 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				
Count year(s)	**Eastern (n=2)**	**Central (n=5)**	**Western (n=4)**	**Eastern[1] (n=5)**	**Central[2] (n=11)**	**Western (n=4)**	**Kenai to Kiska (n=25)**	**Southeast Alaska (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. 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 critical habitat.

			Area Closed To Fishing Km²				Critical Habitat Base Values Km²						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
BSAI/GOA	Pollock	Trawl	12,083	82,106	122,104	26,729	12,083	91,140	177,780	68,526	Foraging	349,529	216,294	281,003	77
	Pacific Cod	Trawl	12,083	66,699	63,351	26,729	12,083	91,140	177,780	68,526	Foraging	349,529	142,134	281,003	51
		Pot	9,485	40,106	54,961	26,729	12,083	91,140	177,780	68,526	Foraging	349,530	104,553	281,003	37
		Longline	9,485	39,890	45,100	25,883	12,083	91,140	177,780	68,526	Foraging	349,531	94,475	281,003	34
	Atka Mackerel (BSAI)	Trawl	5,955	37,375	65,066	26,729	5,955	45,031	98,783	55,651	Foraging	205,420	108,396	149,769	72

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%
BSAI/GOA	Pollock	Trawl	100%	90%	*91%*	69%	39%	70%
	Pacific Cod	Trawl	100%	73%	*76%*	36%	39%	48%
		Pot	78%	44%	*48%*	31%	39%	38%
		Longline	78%	44%	*48%*	25%	38%	34%
	Atka Mackerel (BSAI)	Trawl	100%	83%	*85%*	66%	48%	66%

Table I-12 The amount of area that would have been closed in the BSAI and GOA under the RPA from the 2000 BiOp. Because all fisheries (i.e., pollock, Pacific cod, and Atka mackerel) were closed in the same areas, gear types and fisheries are not presented as they are all the same.

Area	Area Closed (km^2)	Total Area (km^2)	% Closed
0-3 nm	*8,753*	*13,060*	*67.02%*
3-10 nm	*62,660*	*96,974*	*64.62%*
0-10 nm	71,413	110,034	64.90%
10-20 nm	117,959	185,687	63.53%
CH Beyond 20 nm	41,099	70,263	58.49%
Total critical habitat	230,471	365,983	62.97%

Table II-1 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-2 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-3 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-4 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 Within Critical Habitat**	**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-5 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-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).

Zone	Distance from listed rookery or haulout site: Summer (Apr–Sept) (n[1] =6,470)	Distance from listed rookery or haulout site: Winter (Oct–Mar) (n=3,536)	Distance from any point of land: Summer (Apr–Sept) (n=6,470)	Distance from any point of land: 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).

Zone	Summer (Apr–Sept): 0-10 Months (n[1] =41,n[2] =2920)	Summer (Apr–Sept): >10 Months (n=46, n=3550)	Winter (Oct–Mar): 0-10 Months (n=45, n=2950)	Winter (Oct–Mar): >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 (see Figure III-8 for schematic).

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.

	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%	
(in thousands of mt)	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	196.1	199.2	263.3	284.3	40.4	44.7	499.9	528.3	117.1	106.5	617.0	634.8
July-December												
Biomass proportions	30%		43%		7%		80%		20%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	185.0	189.5	246.9	264.3	29.1	42.5	461.0	496.3	119.6	108.9	580.6	605.2
Annual												
Biomass proportions	30%		44%		7%		81%		19%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	189.7	194.1	253.9	271.0	30.2	43.6	473.9	508.8	106.7	96.4	580.6	605.2

Table III-7b Gulf of Alaska Pacific Cod.

	Gulf of Alaska -- Pacific Cod											
January-June	**0-10 nm**		**10-20 nm**		**Foraging Area**		**CH Total**		**Outside CH**		**Total**	
Biomass proportions	23%		34%		5%		62%		38%		100%	
(in thousands of mt)	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	136.2	102.9	194.1	145.7	31.1	23.1	361.4	271.7	206.0	152.6	567.4	424.3
July-December												
Biomass proportions	19%		28%		5%		52%		48%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	110.9	83.4	158.2	116.1	25.1	18.9	294.2	218.5	258.2	193.2	552.4	411.7
Annual												
Biomass proportions	21%		31%		5%		57%		43%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	134.8	101.0	193.1	141.6	30.6	23.0	358.5	265.6	193.9	146.1	552.4	411.7

Table III-7c Eastern Bering Sea pollock.

	Eastern Bering Sea -- Pollock											
January-June	**0-10 nm**		**10-20 nm**		**Foraging Area**		**CH Total**		**Outside CH**		**Total**	
Biomass proportions	8%		16%		19%		44%		56%		100%	
(in thousands of mt)	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	870.3	896.0	1,738.7	1,726.8	1,892.1	1,901.7	4,501.1	4,524.5	5,860.3	5,927.4	10,361.4	10,451.9
July-December												
Biomass proportions	5%		10%		12%		28%		72%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	550.2	557.8	1,069.5	924.3	1,024.5	848.9	2,644.2	2,331.1	7,149.4	7,311.1	9,793.6	9,642.2
Annual												
Biomass proportions	7%		13%		16%		36%		64%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	869.7	887.6	1,713.3	1,588.8	1,784.1	1,632.9	4,367.1	4,109.3	5,426.5	5,532.9	9,793.6	9,642.2

Table III-7d Bering Sea and Aleutian Islands Area Pacific cod.

	Bering Sea and Aleutian Islands Area -- Pacific Cod											
January-June	**0-10 nm**		**10-20 nm**		**Foraging Area**		**CH Total**		**Outside CH**		**Total**	
Biomass proportions	15%		21%		12%		49%		51%		100%	
(in thousands of mt)	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	175.7	189.7	238.8	245.9	133.7	142.0	548.2	577.6	591.1	609.0	1,139.3	1,186.6
July-December												
Biomass proportions	12%		17%		10%		38%		62%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	130.8	143.8	175.7	179.2	97.0	99.2	403.5	422.3	694.8	697.0	1,098.3	1,119.3
Annual												
Biomass proportions	13%		19%		11%		43%		57%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	172.7	187.2	235.3	240.8	130.9	134.2	538.9	562.2	559.4	557.1	1,098.3	1,119.3

Table III-7e Aleutian Islands Atka mackerel

	Aleutian Islands -- Atka Mackerel											
January-June	**0-10 nm**		**10-20 nm**		**Foraging Area**		**CH Total**		**Outside CH**		**Total**	
Biomass proportions	31%		35%		1%		67%		33%		100%	
(in thousands of mt)	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	177.4	118.4	194.3	125.2	5.0	3.3	376.8	246.8	184.1	117.6	560.9	364.4
July-December												
Biomass proportions	31%		35%		1%		67%		33%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	175.0	118.2	183.5	114.7	5.0	3.3	363.6	236.1	168.2	103.3	531.8	339.4
Annual												
Biomass proportions	31%		35%		1%		67%		33%		100%	
	1999	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	175.0	118.2	183.5	114.7	5.0	3.3	363.6	236.1	168.2	103.3	531.8	339.4

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

	BSAI and GOA -- Pollock, Pacific Cod, and Atka Mackerel											
	0-10 nm		10-20 nm		Foraging Area		CH Total		Outside CH		Total	
January-June (in thousands of mt)	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	1,555.8	1,506.1	2,629.1	2,528.0	2,102.3	2,114.8	6,287.2	6,148.9	6,958.8	6,913.1	13,246.0	13,062.0
July-December	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	1,151.8	1,092.7	1,833.9	1,598.7	1,180.7	1,012.9	4,166.4	3,704.3	8,390.3	8,413.5	12,556.7	12,117.8
Annual	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**	**1999**	**2002**
Catch mt	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%
Biomass remaining mt	1,542.0	1,488.0	2,579.0	2,357.0	1,980.8	1,837.0	6,101.8	5,682.0	6,454.9	6,435.8	12,556.7	12,117.8

Table III-8 Forage required by Steller sea lions and all groundfish biomass in Critical Habitat for the Eastern Bering Sea, Aleutian Island, and Gulf of Alaska. Groundfish biomass was calclated based on all FMP species based on the 2000 SAFE documents.

	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.

Table IV-1. Summary table of the regulatory and performance measures related to the 2002 Steller sea lion conservation measures. Described below are the specific conservation measures organized by fishery and the guidelines that NMFS used in determining the color for each cell. In general, green indicates that the goals were reached or that there is little or no concern about this fishery; yellow indiactes that there may be some concern and that the goals were either not reached or some other event occurred which leaves some concerns; red indicates ares which there is some concern with regard to adverse affects with sea lions, that the goals were not reached, or that conservation measures were less conservative than in 1999. A red cell does not indicate jeopardy or adverse modification of critical habitat - that is a determination based upon the entire suite of management measures. In this table NMFS attempted to provide an overview of the whole suite of management measures in order to compare the relative conservation benefit from each action and fishery and are meant to be relative to each other. The guidelines are qualitative even where numerical values are provided as other considerations were used in determining which rating is appropriate. For example. BSAI trawl cod had 57% of the catch within the 0-10 nm zone, the guideline was for 75% closure, yet the cell was colored green. This was due in part to the size of the shelf in the AI, the relatively high closure value, and the fact that Pacific cod is only of seasonal importance in the AI and relatively much less importance to sea lions in the AI compared to Atka mackerel. See section IV of the document for further discussion of the table.

Category	Conservation Measure	Specific Action	Guideline	Pacific Cod								
				BSAI Trawl		BSAI H-&-L		BSAI pot		GOA Trawl	GOA H-&-L	GOA pot
				EBS	AI	EBS	AI	EBS	AI			
Regulatory	Spatial overlap - area closed to fishing	0-3 nm	100%	100%	100%	100%	100%	100%	100%	100%	58%	58%
		0-10 nm	75%	93%	57%	65%	63%	67%	63%	85%	32%	32%
		10-20 nm	50%	60%	4%	57%	18%	60%	18%	48%	16%	27%
		>20 nm, Foraging	Qualitative	45%	100%	44%	100%	45%	100%	0%	0%	0%
		Critical habitat	50%	58%	25%	52%	36%	54%	36%	57%	20%	27%
	Temporal overlap	Seasonal closures	Winter closure	Winter closure from Nov. 1 to Jan. 20		None		None		Winter closure from Jan. 1-20	None	None
	Localized depletions	Seasonal distribution	Two seasons, 50/50	Three season split: 1/20-3/31 (60%); 4/1-6/10 (20%); 6/10-10/31 (20%)		Two season split: 1/1 (60%); 6/11 (40%)		Two season split: 1/1 (60%); 9/1 (40%)		Two season split: 1/20 (60%); 9/1 (40%) [bycatch, and regs create problem]	Two season split: 1/1 (60%); 9/1 (40%)	Two season split: 1/1 (60%); 9/1 (40%)
		CH catch limits	Appropriate to provide catch in proportion to biomass inside critical habitat	None		None		None		None	None	None
Performance	Observed change in fishing spatial patterns from 1999	Percent catch in CH areas	Green = >25% decrease, Yellow = <25 decrease or no change, Red = increase	Down about 50% in 3-10, up 25% in 10-20 and unchanged overall in CH		Down 75% in 3-10, down 41% and 34% in 10-20 and CH overall		Down 4% in 3-10, 25% in 10-20, and 18% overall in CH		Down 7% in 3-10, up 12% in 10-20, and up 3% overall	Down between 30-41% in all areas.	Down 18% in 3-10, up 127% in 10-20 and up 31% overall
	Observed change in fishing temporal patterns from 1999		Green = <40% first quarter, Yellow = ~40-50% in first quarter, Red = >50% in first quarter	About 60-70% in the first quarter, about the same for the past 5 years, no change		About 40-50% in the first quarter, about the same for the past 5 years, no change		Variable catch in the first quarter, generally 60-100% in the first quarter		Between 40-70% in the first quarter, about 55% in 2002 compared to 70% in 1999.	Catch concentrated in first quarter of the year from 2000-2002 (70% in 2002), in 1998 and 1999 catch split between first and second quarters	About 40% in the first quarter in 2002, variable over the last 5 years
	Catch rates in critical habitat	0-10 nm	Green = substantial reductions and lower than annual in CH areas, Yellow = no change or about equal to annual in CH,	About a 50% reduction from 1999-2002, and lower than the annual rate (about a third)						Winter reduction, summer increase as expected due to seasonal split, yet rates are still relatively high for this nearshore area		
		10-20 nm		Catch rates about the same from 1999-2002, about twice as high in the winter as the annual rate. In the winter, rates changed from 12.5% to 12.8%, when the rate should have been in the range of 7-9%						Winter reduction, summer increase as expected due to seasonal split		
		Foraging area		Small reduction from 1999-2002 in the winter (but still above the annual rate), overall for the year about the same as 1999, and above the annual rate for the year.						Down slightly in the winter, but still above the annual rate. Down slightly on an annual basis and 2% below the annual rate.		
		Critical habitat		Small reduction from 1999-2002 in the winter (but still above the annual rate), overall for the year about the same as 1999, and just below the annual rate for the year.						Overall slight reduction in winter, increase in the summer, and the annual was down by about 1.5%.		
	Displaced fishing effort	Amount of historic fishing which was displaced by the 2001 conservation measures.	Fixed Gears: Green = >10% displacement, Yellow = 2-10% displacement, Red = 0-2% displacement --- Trawl Gear: Green >10% displacement, Yellow = 5-10% displacement, Red = <5% displacement	Only 4% of the fishery was displaced from 1999 under the closures, indicating only a marginal impact on the fishery with regard to loss of traditional fishing areas that were within critical habitat.		Only 2% of the fishery was displaced from 1999 under the closures, indicating only a marginal impact on the fishery with regard to loss of traditional fishing areas that were within critical habitat.		Only 5% of the fishery was displaced from 1999 under the closures, indicating only a marginal impact on the fishery with regard to loss of traditional fishing areas that were within critical habitat.		19% of the fishery was dispaced from 1999 and 52% from 1991, indicating that fishery closures did have an impact in closing traditional fishing grounds close to shore.	Only 4% of the fishery was displaced from 1999 under the closures, indicating only a marginal impact on the fishery with regard to loss of traditional fishing areas that were within critical habitat.	20% of the fishery was dispaced from 1999 and 31% from 1998, indicating that fishery closures did have an impact in closing traditional fishing grounds close to shore.

Table IV-1. Continued.

Category	Conservation Measure	Specific action	Guideline	Pollock EBS Trawl	Pollock GOA Trawl	Pollock AI Trawl	Atka Mackerel BSAI trawl	Data Used
Regulatory	Spatial overlap - area closed to fishing	0-3 nm 0-10 nm 10-20 nm >20 nm, Foraging Critical habitat	100% 75% 50% Qualitative 50%	100% 93% 60% 45% 58%	100% 85% 48% 0% 57%	100% 100% 100% 100% 100%	100% 78% 45% 100% 58%	Tables I-8, I-9, I-10, I-11; Figure I-7
	Temporal overlap	Seasonal closures	Winter closure	Winter closure from Nov. 1 to Jan. 20	Winter closure from Nov. 1 to Jan. 20	Winter closure from Nov. 1 to Jan. 20	Winter closure from Nov. 1 to Jan. 20	Table I-9
	Localized depletions	Seasonal distribution	Two seasons, 50/50	Two season split: 1/20 to 6/10 (40%); 6/10 to 11/1 (60%)	Four season split: 1/20 to 2/25 (25%); 3/10 to 5/31 (25%), 9/25 to 9/15 (25%), 10/1 to 11/1 (25%)	Two season split: 1/20 to 6/10 (40%); 6/10 to 11/1 (60%)	Two season split: 1/20 to 4/15 (50%); 9/1 to 10/31 (50%)	Table I-9
		CH catch limits	Appropriate to provide catch in proportion to biomass inside critical habitat	SCA limit within A season at 28% of the annual TAC before April 1, the remaining 12% is available within the SCA prior to June 10.	None	No fishing inside critical habitat	60% of the seasonal apportionment of TAC can be harvested from critical habitat	Table I-9
Performance	Observed change in fishing spatial patterns from 1999	Percent catch in CH areas	Green = >25% decrease, Yellow = <25 decrease or no change, Red = increase	Slight increase in 3-10, 255% increase in 10-20 and a 49% overall increase in CH	Decreases in all zones of CH of between 20-34%	N/A	Down 77% in 3-10, up 11% in 10-20, and down 12% overall	Tables III-2, III-3, III-4; Figures III-1, III-2, III-3; Appendix 2
	Observed change in fishing temporal patterns from 1999		Green = <40% first quarter, Yellow = ~40-50% in first quarter, Red = >50% in first quarter	Similar pattern for the last 4 years, roughly 40% in first quarter, and 50% in the third quarter.	Catch dispersed among three seasons, about 40% in the first quarter in 2002	N/A	Seasonally dispersed fishery, reduction in average daily catch and the maximum daily catch by about 30%	Table III-5; Figures III-4, III-5, III-6, III-7
	Catch rates in critical habitat	0-10 nm	Green = substantial reductions and lower than annual in CH areas, Yellow = no change or about equal to annual in CH, Red = increases or greater than annual rate in CH areas	Incrases in catch rate in all seasons, primarily due to Catch off St. George Island, but still very low Catch rate overall in this area	Substantial reduction	N/A	Lower rates in winter and summer, substantially below the annual rate	Table III-7(a-f)
		10-20 nm		Large increases in rates from 99-02, rates equal to or higher than the annual rate	Substantial reduction	N/A	Increases of about 2-3% in both winter and summer rates, and overall. Rates were above the annual rate slightly.	
		Foraging area		Increases in rates from 99-02, winter rates equal to the annual rate and much higher in the summer (triple the expected rate)	Substantial reduction	N/A	No catch.	
		Critical habitat		Increases in rates from 99-02, winter just above the annual rate and much higher in the summer and annual (double the expected rate)	Substantial reduction	N/A	Little change from 1999-2002, overall rates are similar to the annual rate.	
	Displaced fishing effort	Amount of historic fishing which was displaced by the 2001 conservation measures.	Fixed Gears: Green = >10% displacement, Yellow = 2-10% displacement, Red = 0-2% displacement --- Trawl Gear: Green >10% displacement, Yellow = 5-10% displacement, Red = <5% displacement	Only 1% of the fishery was dispaced from 1999, indicating that fishery closures did little to decrease the historic fishing areas. In other words, areas were closed that the fishery did not use in 1999.	10% of the fishery was dispaced from 1999 and 52% from 1998, indicating that fishery closures did have an impact in closing traditional fishing grounds close to shore.	There has been no fishing in critical habitat since 1999, therefore 100% has been displaced. In 1991, 74% of the catch was removed from critical habitat, so this represents the amount of traditional fishing which has been foregone, and is substantial.	Traditional fishing areas have been substantial, 18% of the 1999 fishery was displaced and 89% of the fishery was displaced since 1991 indicating that the cumulative closures over the last decade has had a signficant impact on the fishery.	Table III-6

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).

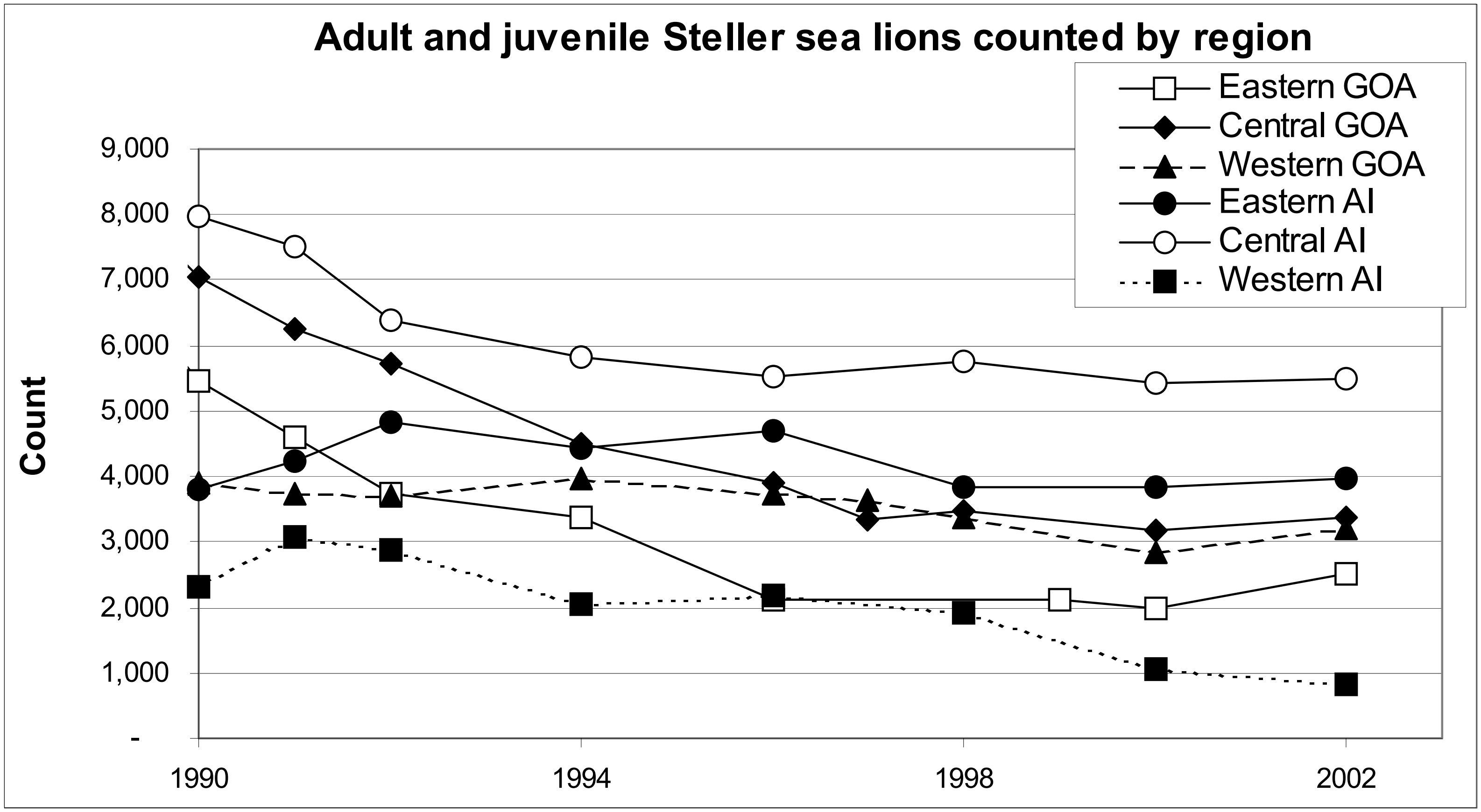


Figure I-2 Counts of adult and juvenile Steller sea lions in the western DPS at trend sites from Kenai to Kiska from the late 1970s to 2002 (Sease and Gudmundson in review).

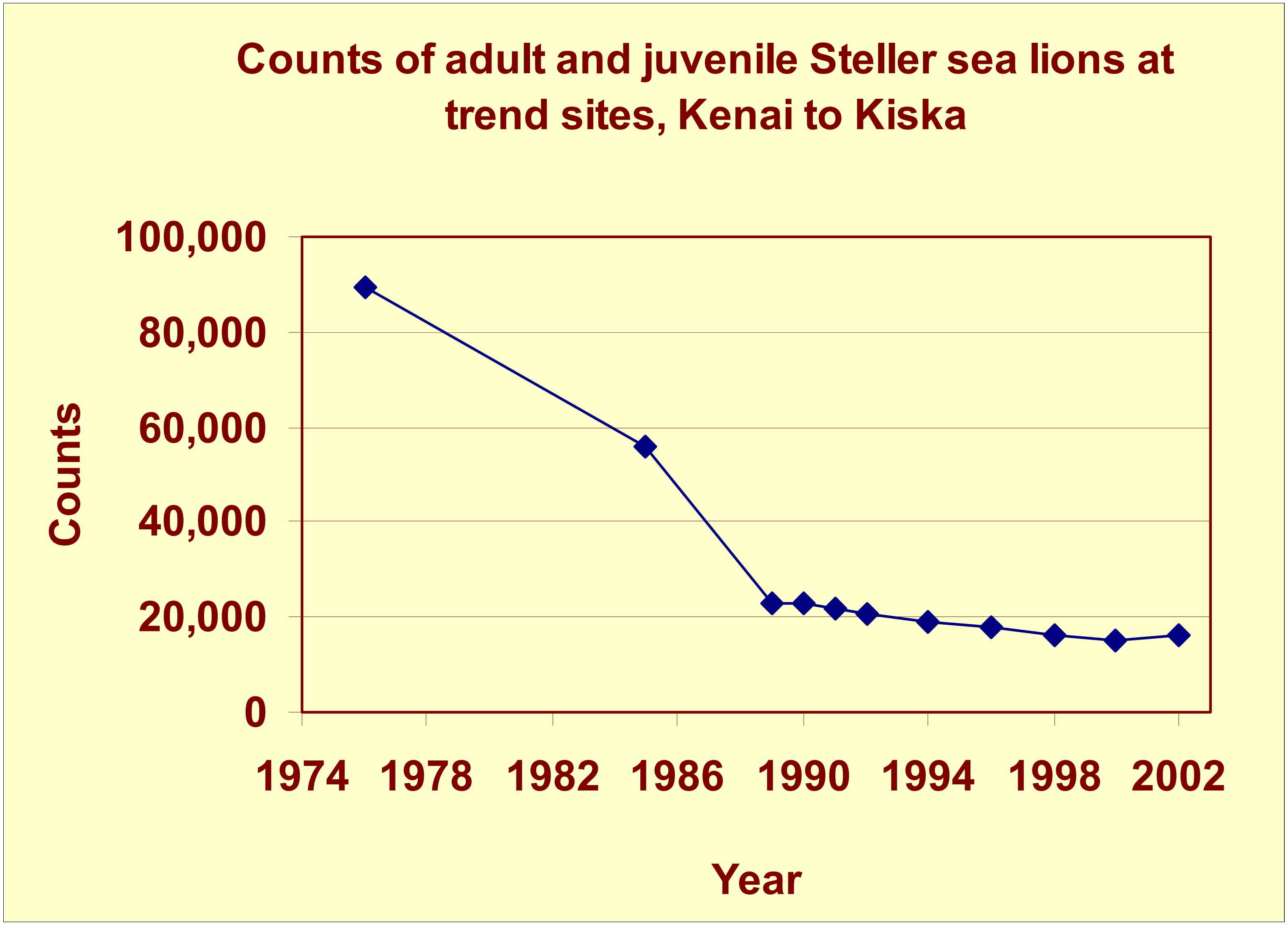
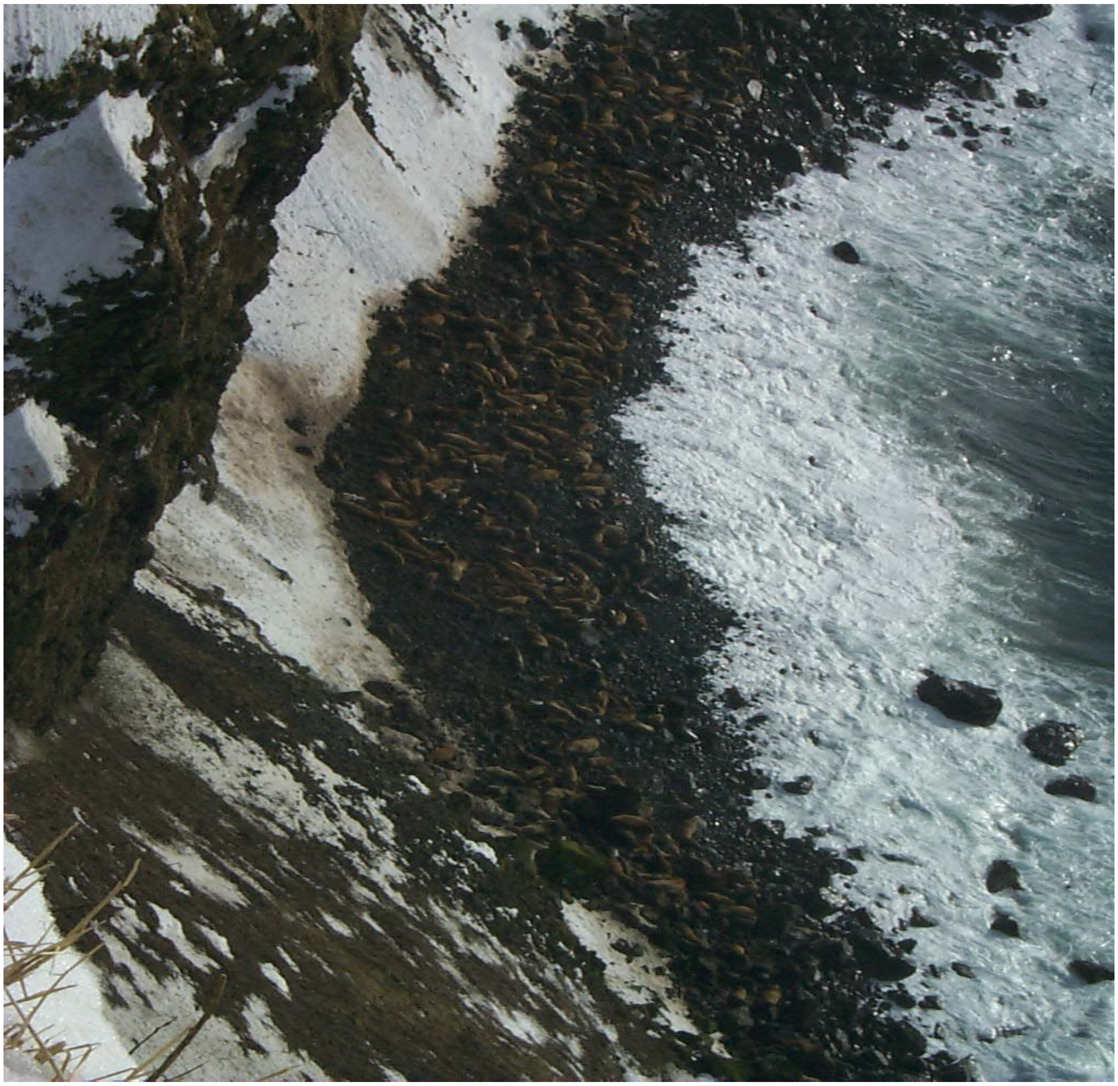


Figure I-3 Photograph of Steller sea lions at Dalnoi Point, St. George Island 2002 (Kent Sudseth, pers. comm.).



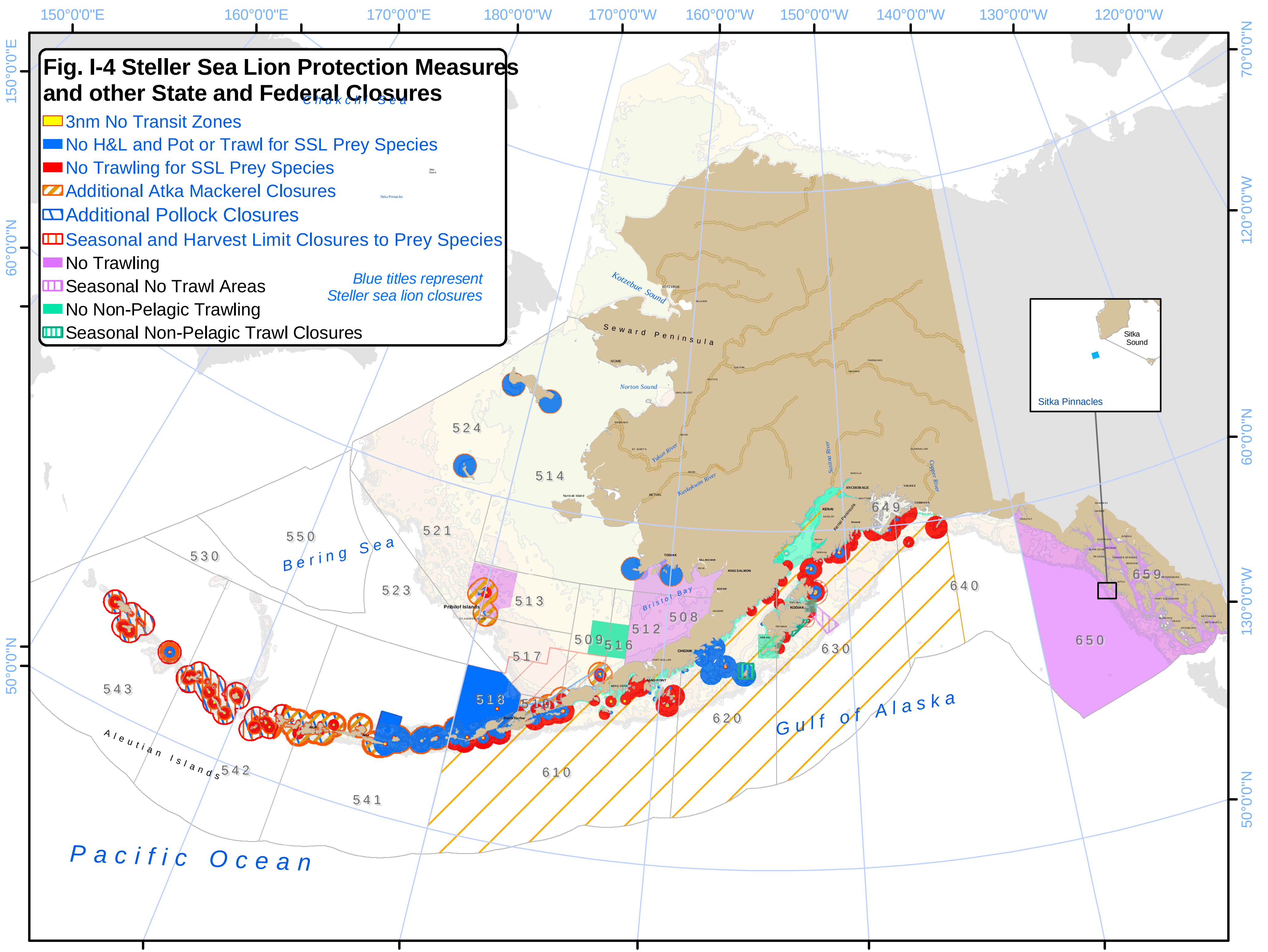
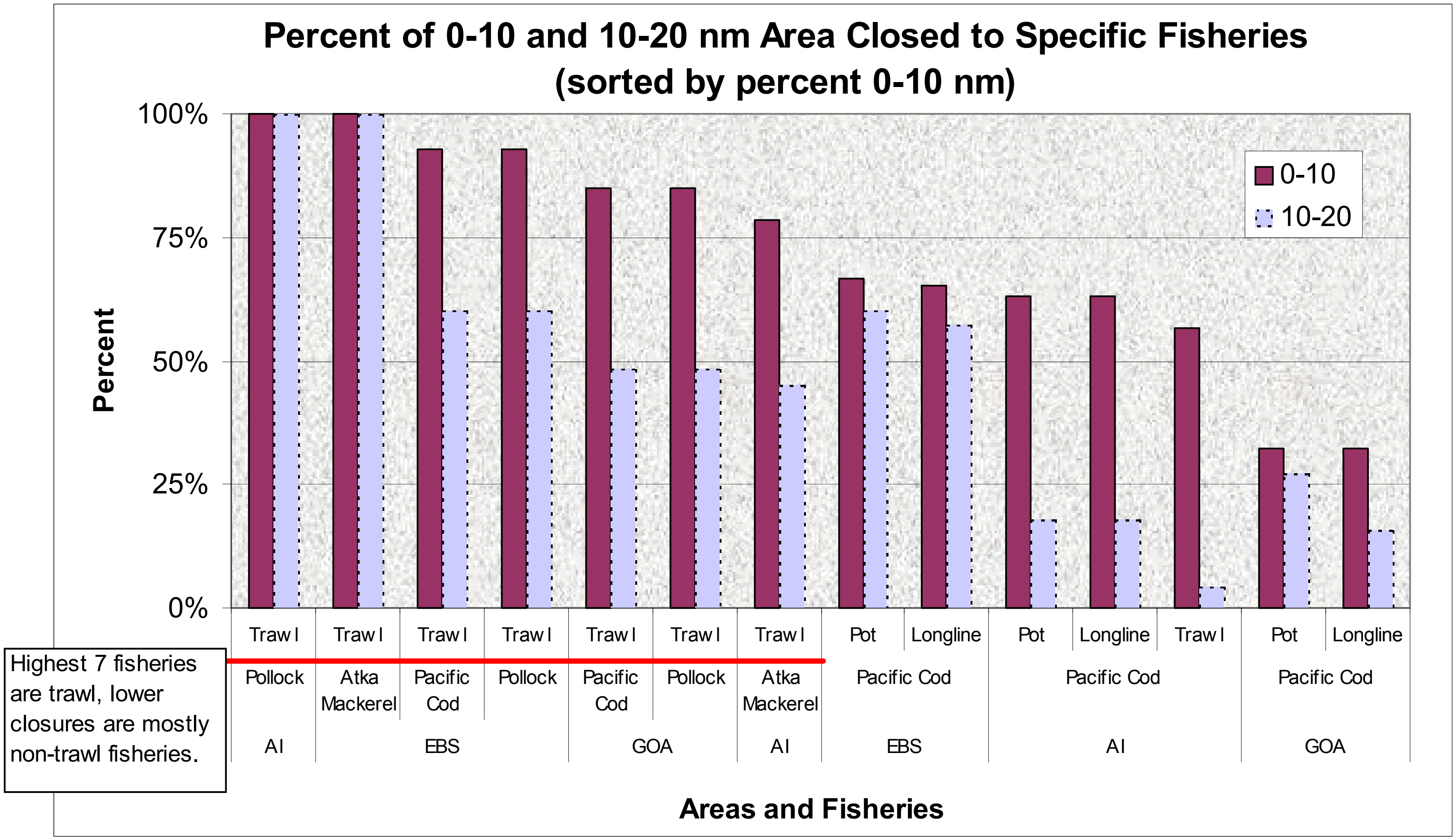


Fig. I-4 Steller Sea Lion Protection Measures and other State and Federal Closures
3nm No Transit Zones
No H&L and Pot or Trawl for SSL Prey Species
No Trawling for SSL Prey Species
Additional Atka Mackerel Closures
Additional Pollock Closures
Seasonal and Harvest Limit Closures to Prey Species
No Trawling
Seasonal No Trawl Areas
No Non-Pelagic Trawling
Seasonal Non-Pelagic Trawl Closures
Blue titles represent Steller sea lion closures
Chukchi Sea
Bering Sea
Gulf of Alaska
Pacific Ocean
Aleutian Islands
Bristol Bay
Seward Peninsula
Kotzebue Sound
Norton Sound
Sitka Pinnacles
Sitka Sound
524
514
521
550
530
523
513
509
516
512
508
517
518
519
543
542
541
610
620
630
640
649
650
659
150°0'0"E
160°0'0"E
170°0'0"E
180°0'0"W
170°0'0"W
160°0'0"W
150°0'0"W
140°0'0"W
130°0'0"W
120°0'0"W
50°0'0"N
60°0'0"N
70°0'0"N

Figure I-5 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).



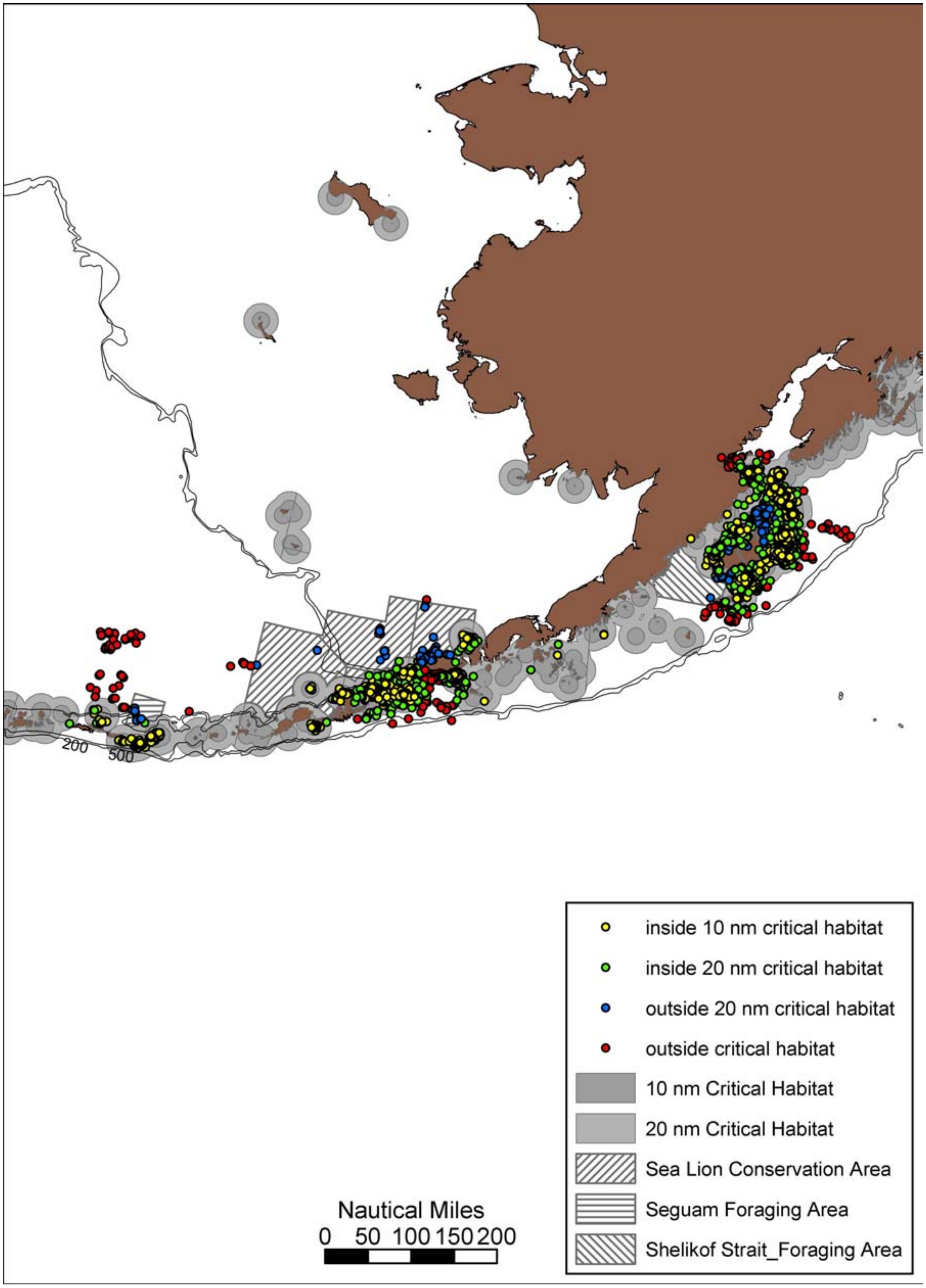


Figure II-1 Locations associated with dives to greater than 4 meters recorded for 63 juvenile Steller sea lions in 2000-2002.

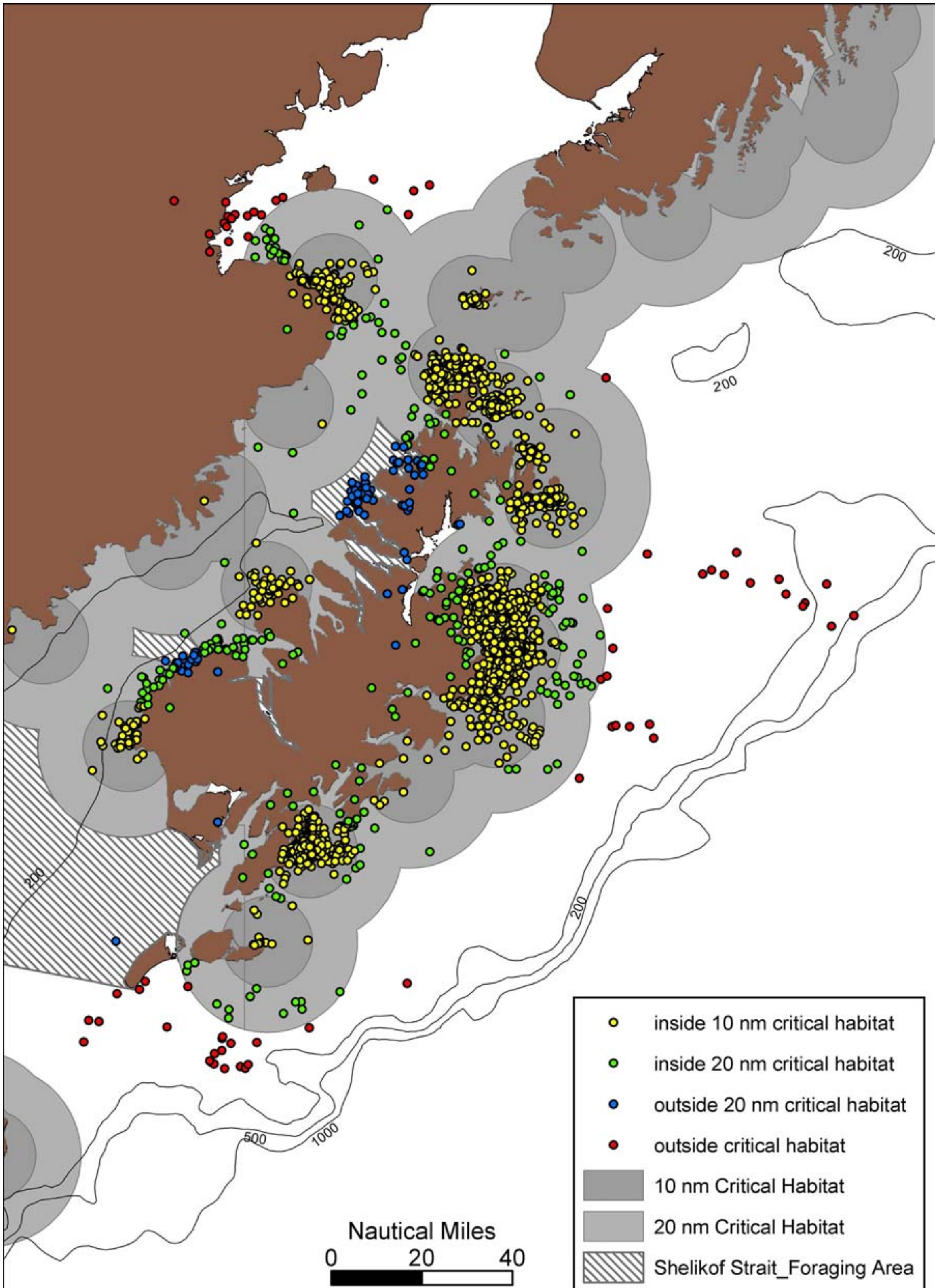


Figure II-2a Locations associated with dives to greater than 4 meters during summer (April-September) recorded for juvenile Steller sea lions in the Kodiak area during 2000-2002.

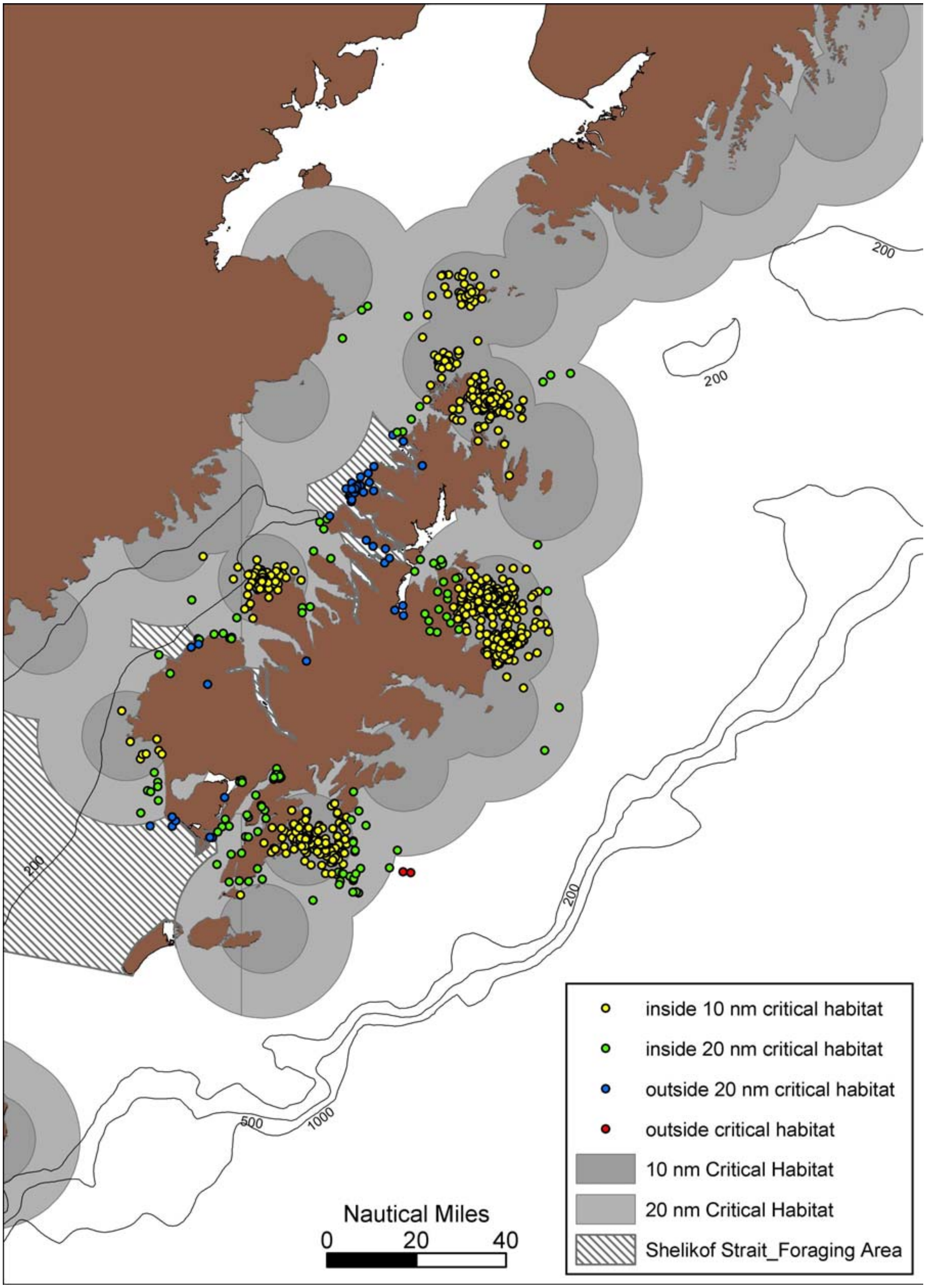


Figure II-2b Locations associated with dives to greater than 4 meters during winter (October-March) recorded for juvenile Steller sea lions in the Kodiak area during 2000-2002.

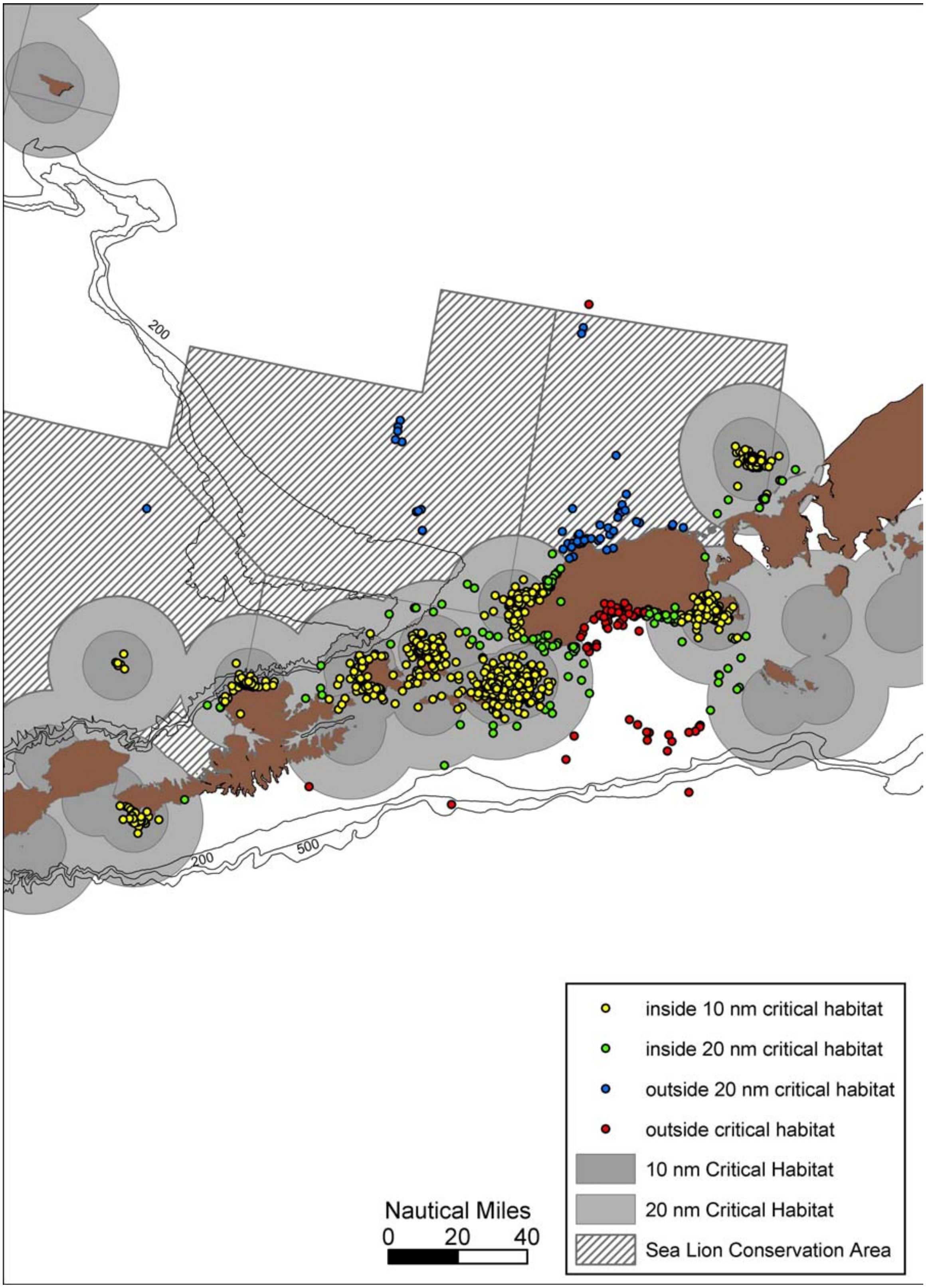


Figure II-3a Locations associated with dives to greater than 4 meters during summer (April-September) recorded for juvenile Steller sea lions in the Eastern Aleutians area during 2000-2002.

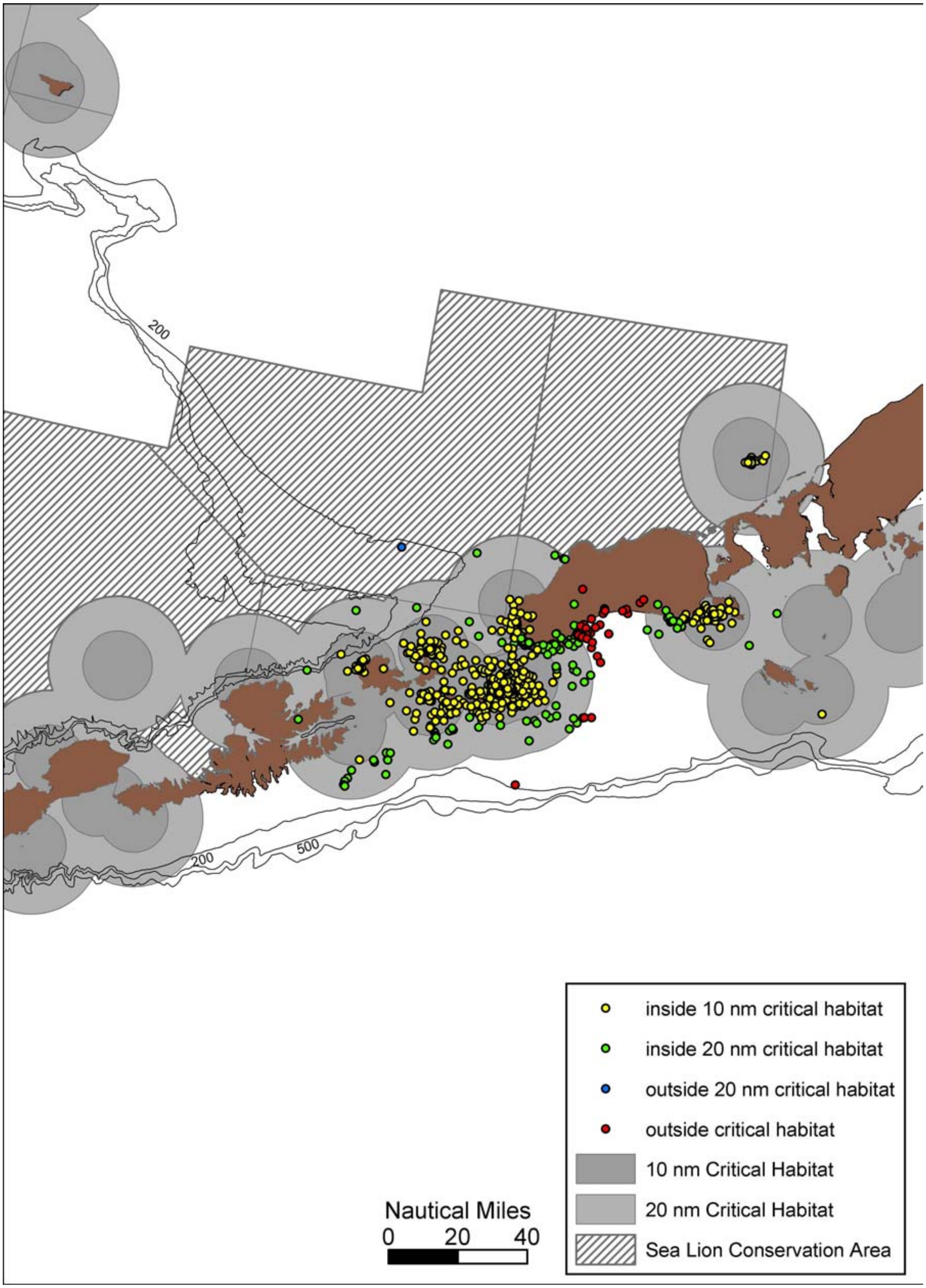


Figure II-3b Locations associated with dives to greater than 4 meters during winter (October-March) recorded for juvenile Steller sea lions in the Eastern Aleutians area during 2000-2002.

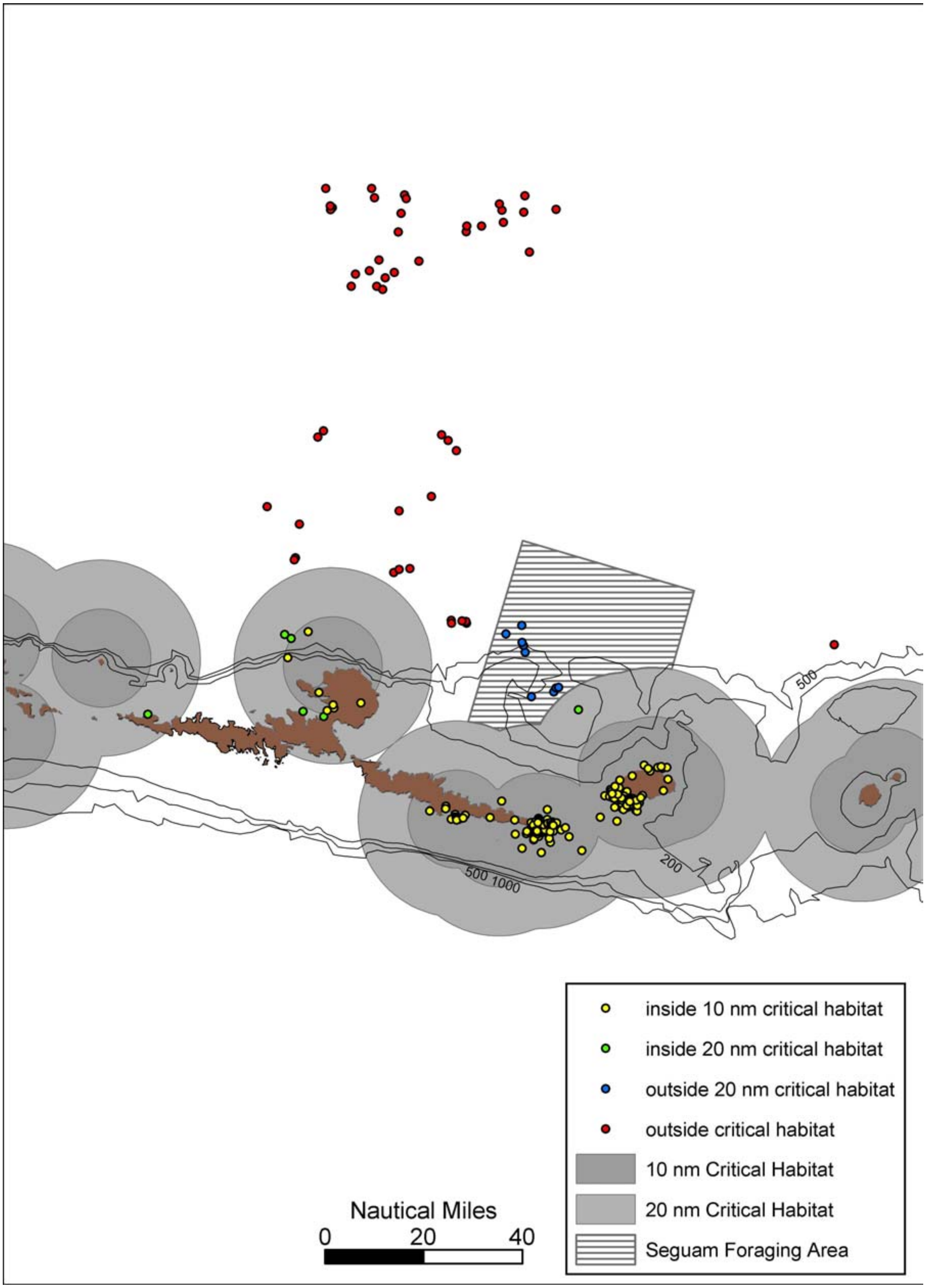


Figure II-4a Locations associated with dives to greater than 4 meters during summer (April-September) recorded for juvenile Steller sea lions in the Central Aleutians area during 2000-2002.

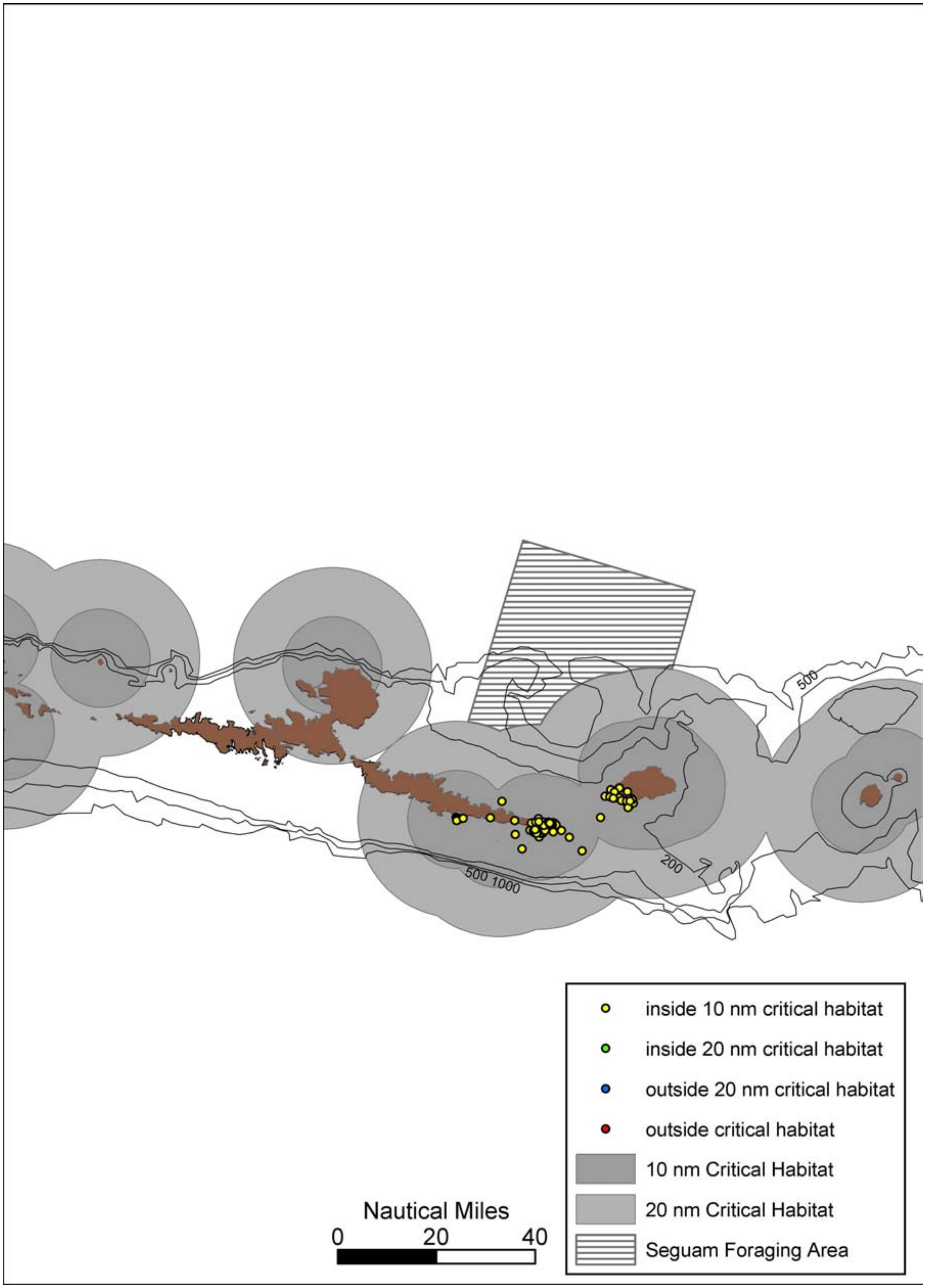


Figure II-4b Locations associated with dives to greater than 4 meters during winter (October-March) recorded for juvenile Steller sea lions in the Central Aleutians area during 2000-2002.

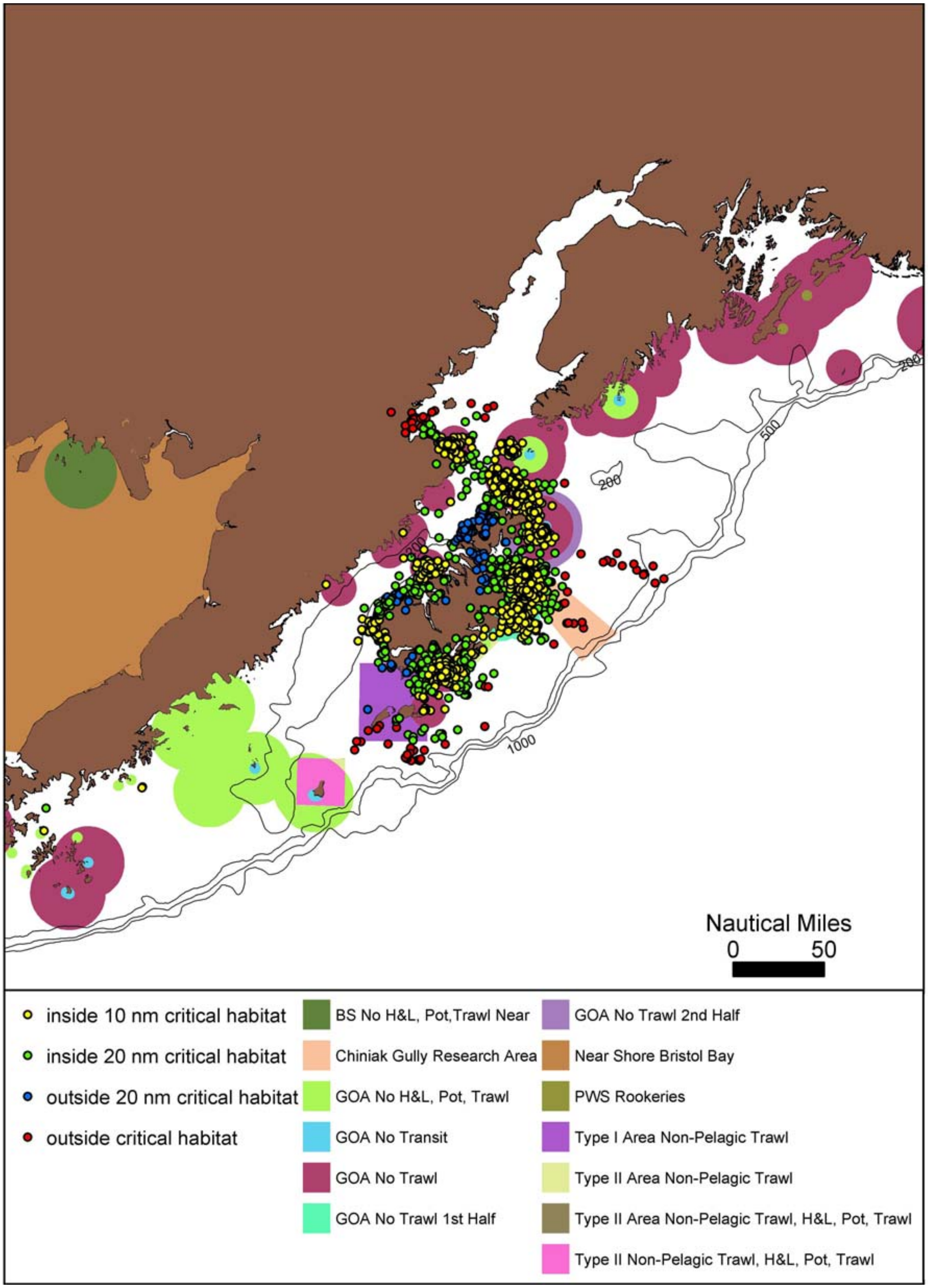


Figure II-5 Locations associated with dives to greater than 4 meters recorded for juvenile Steller sea lions in the Kodiak area during 2000-2002 overlaid with the current fisheries management zones.

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

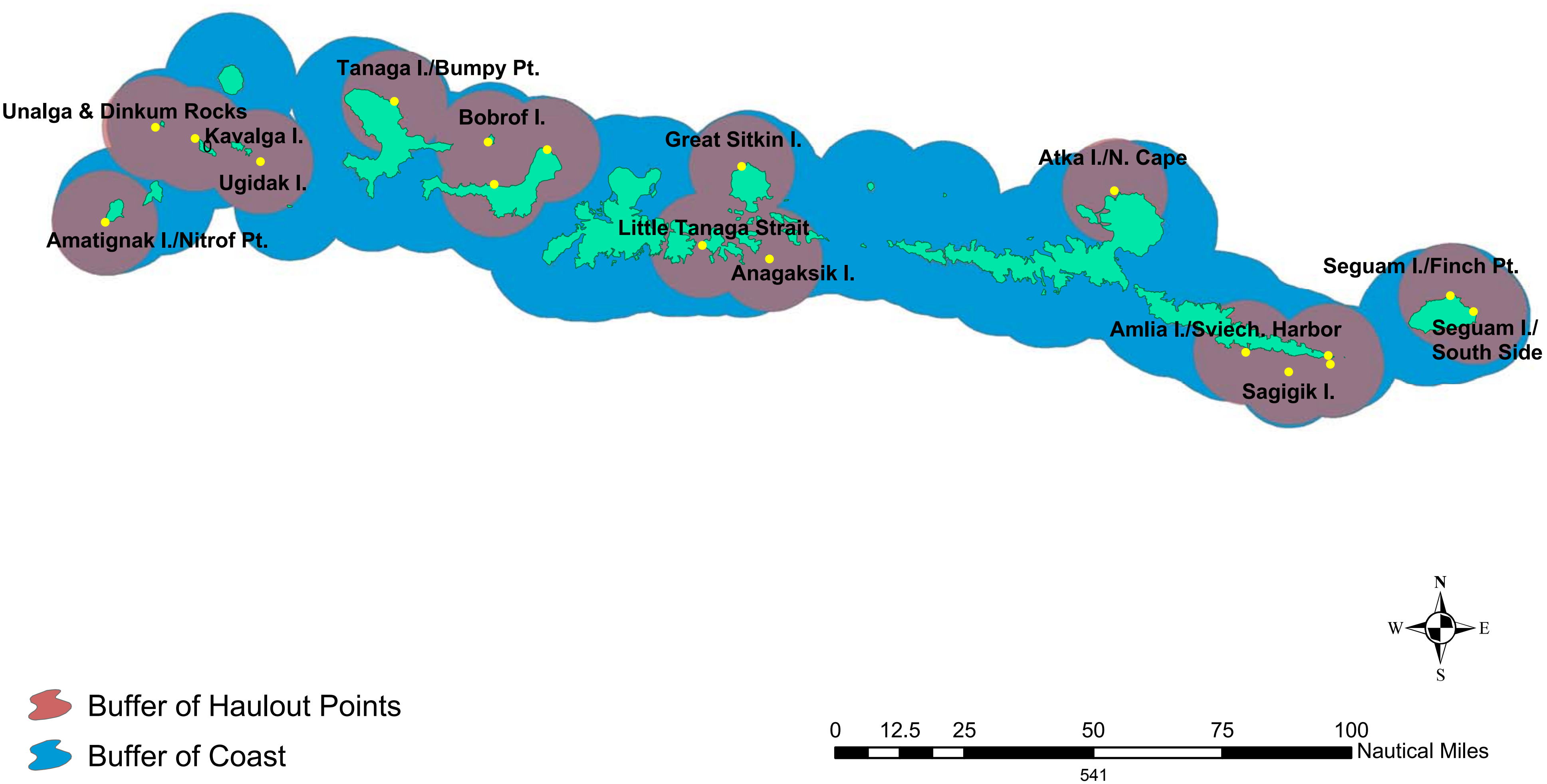
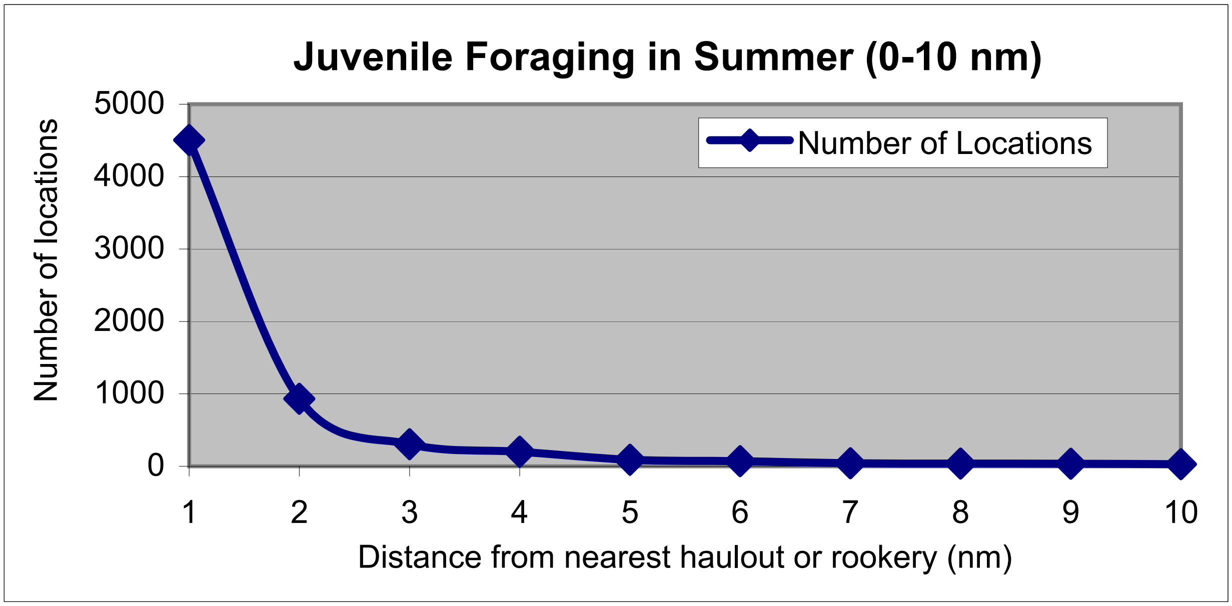


Figure II-7. Analysis of the locations inside 0-10 nm using the juvenile dive-filtered database listed as the distance from shore (i.e., any point of land).



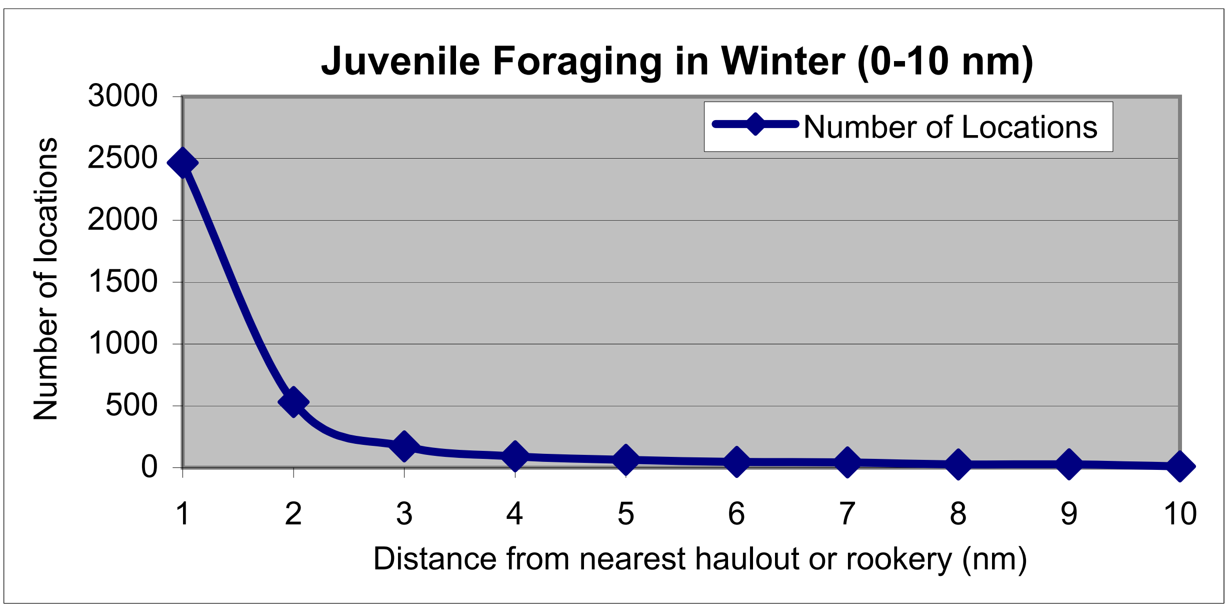
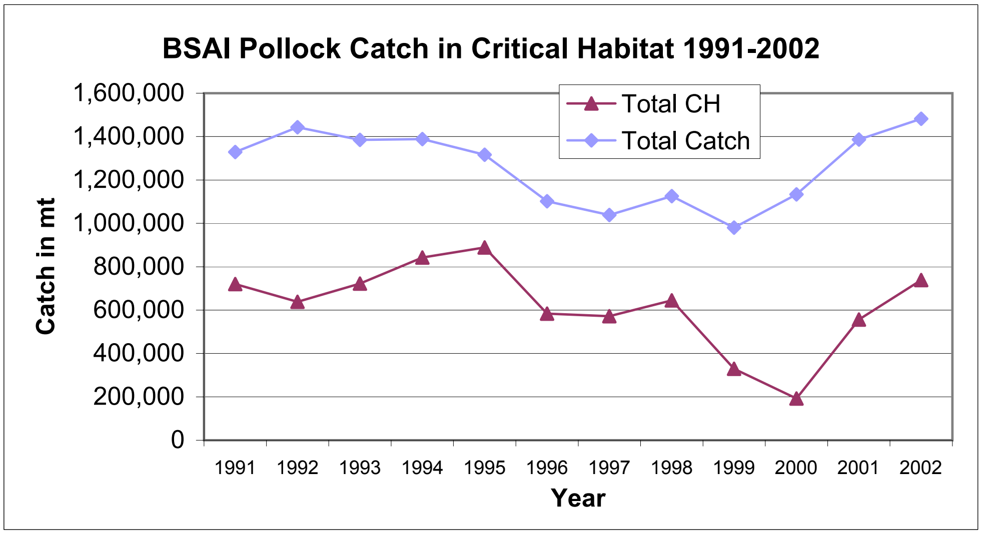
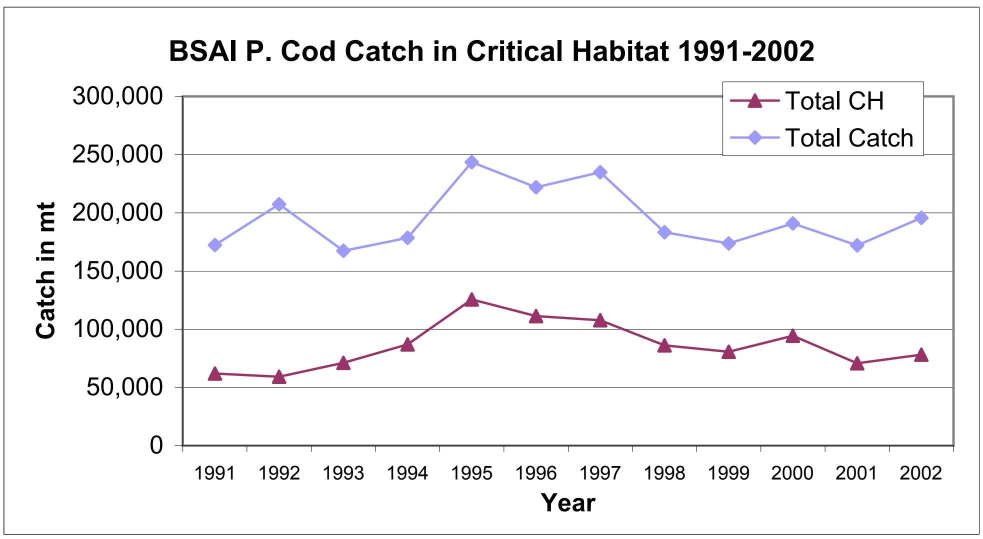


Figure III-1 BSAI catch in critical habitat and total catch of pollock, P. cod, and Atka mackerel 1991-2002.





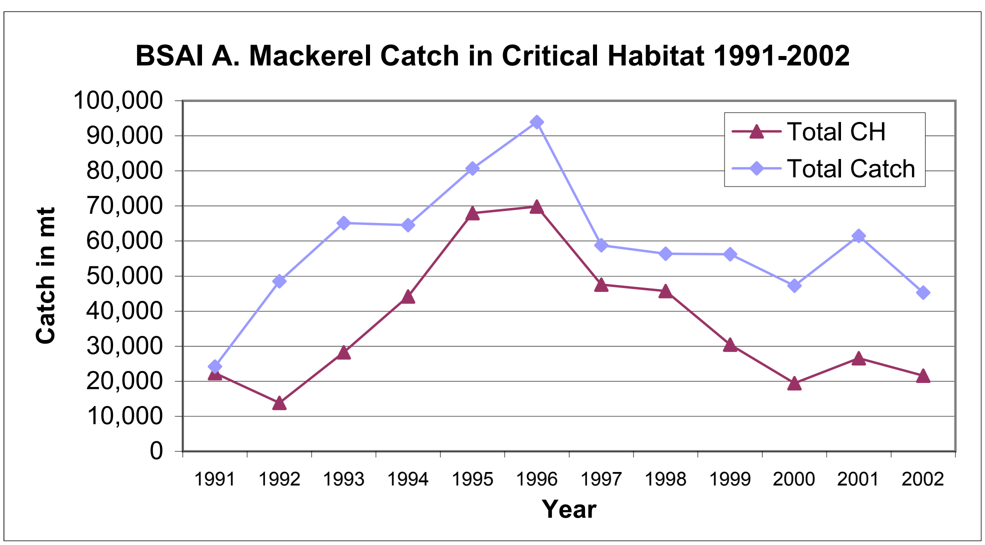
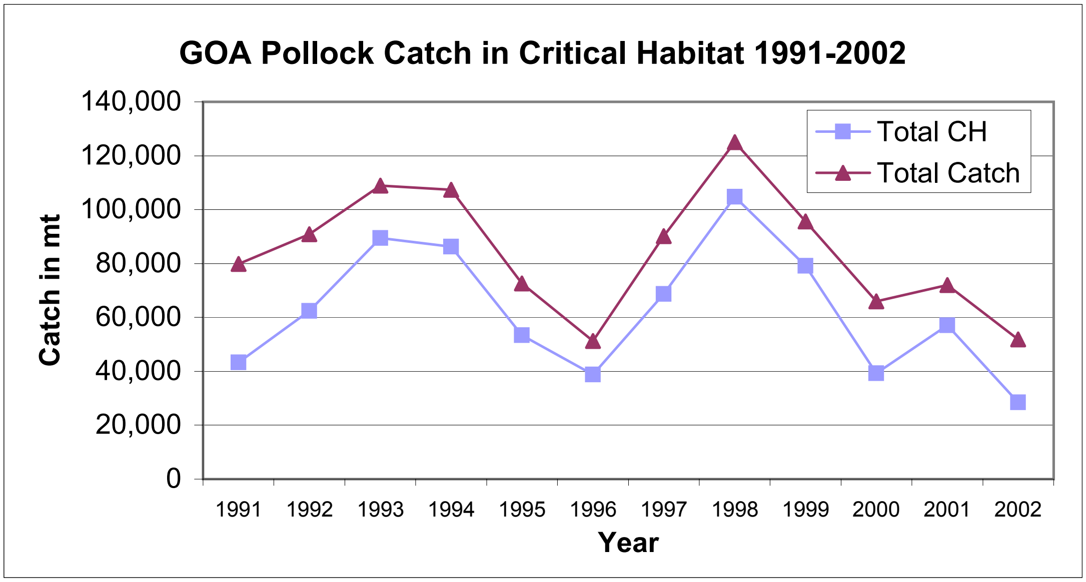


Figure III-2 GOA catch in critical habiatat and total catch of pollock and P. cod 1991-2002.



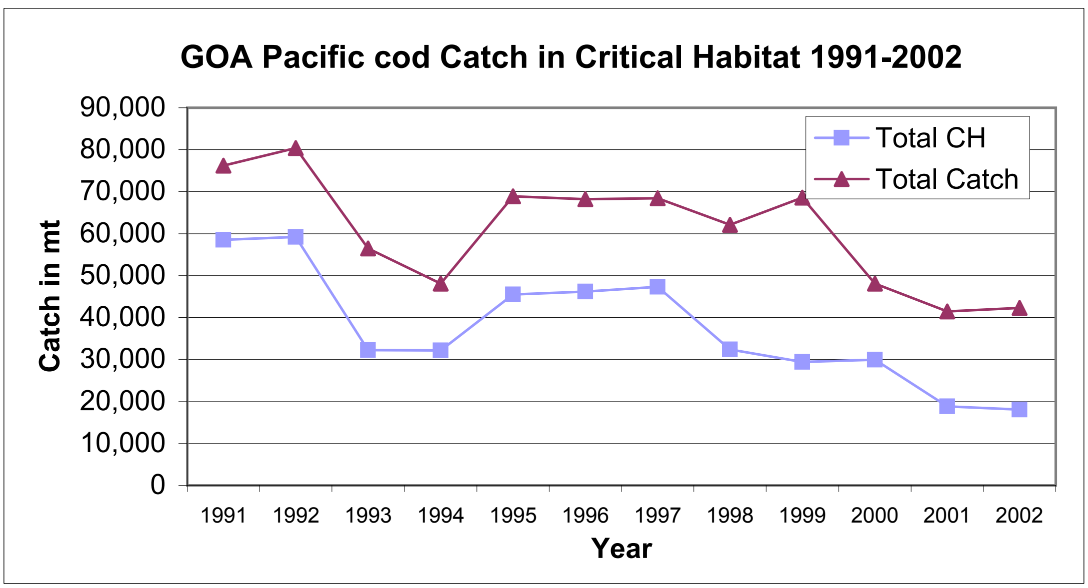
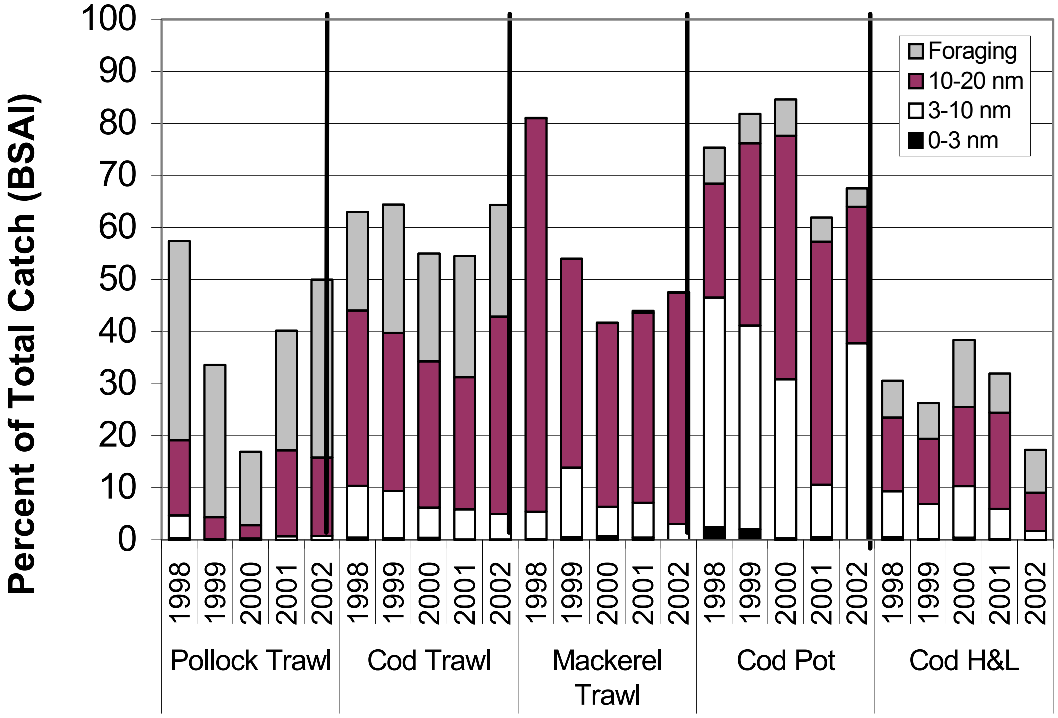


Figure III-3 Amount of catch within 0-3 nm, 3-10 nm, 10-20 nm, and foraging areas of critical habitat in the BSAI and GOA by gear types from 1998-2002.



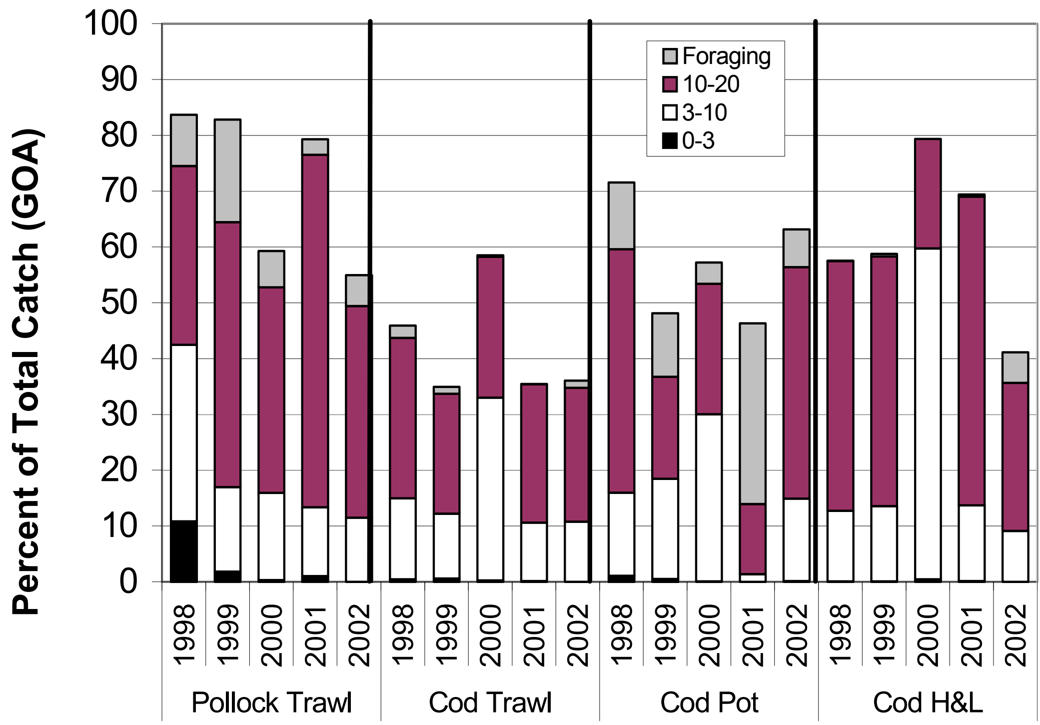
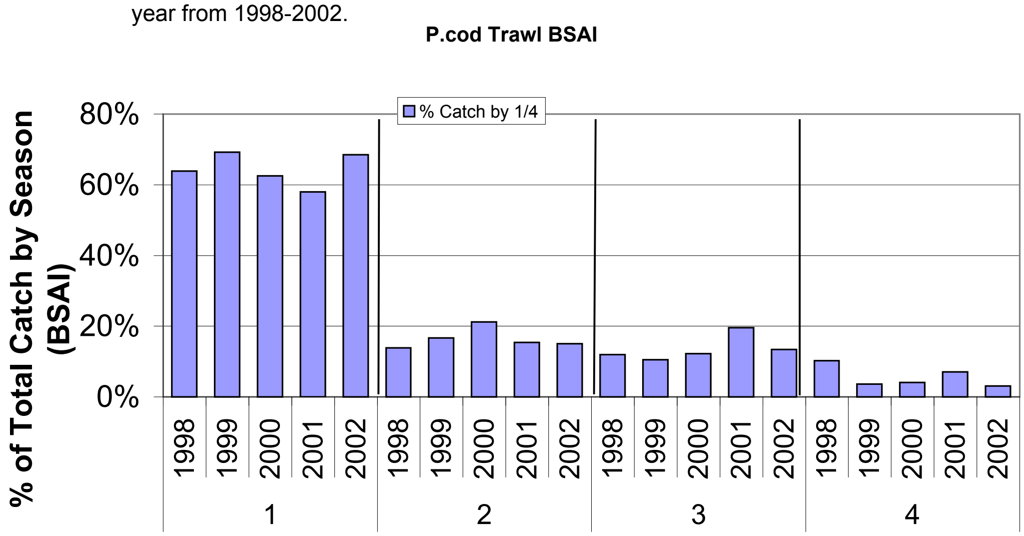
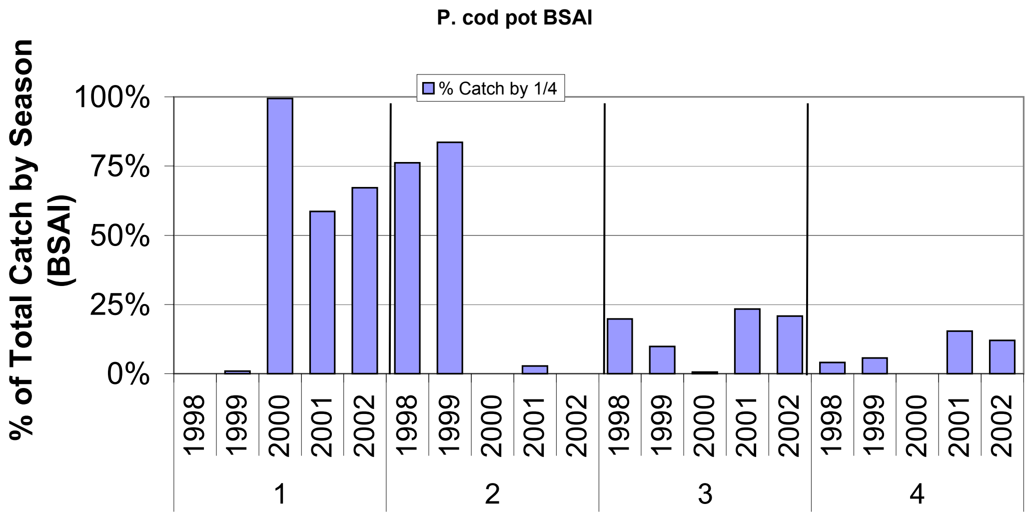


Figure III-4 Percent of the BSAI annual catch of Pacific cod harvested in each quarter of the year from 1998-2002.





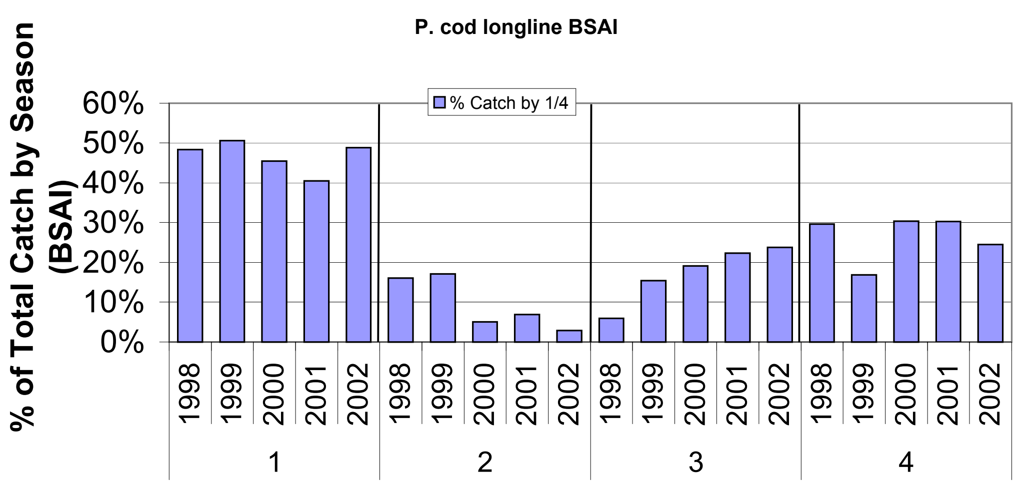
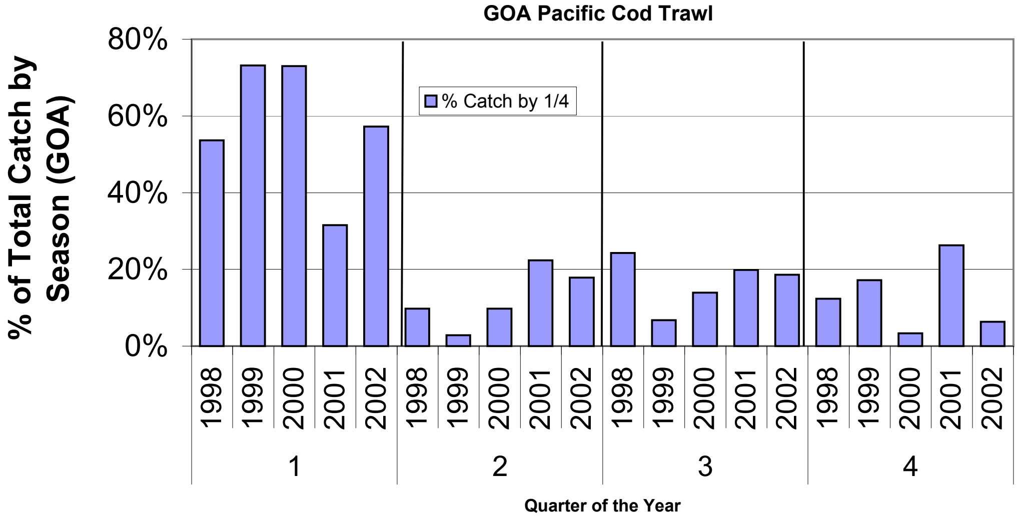
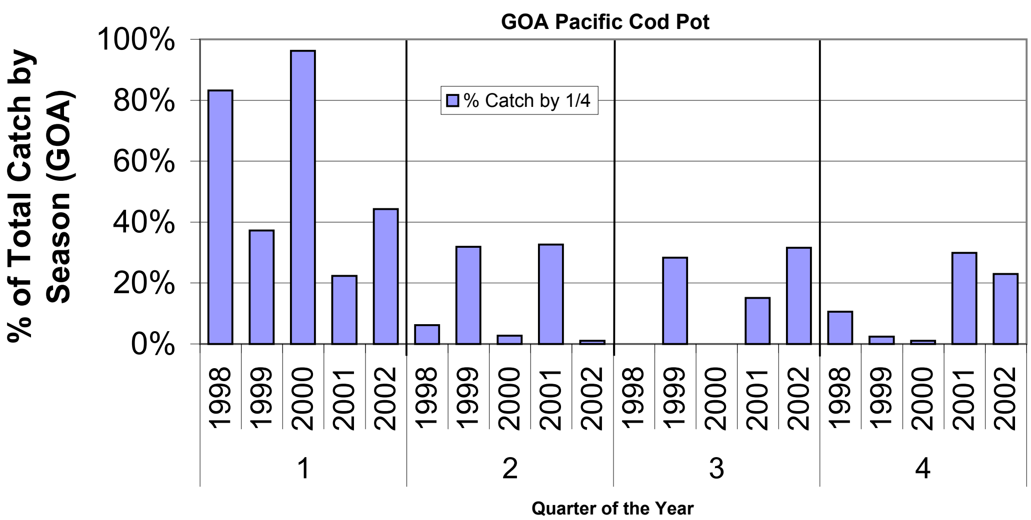


Figure III-5 Percent of the GOA annual catch of Pacific cod harvested in each quarter of the year from 1998-2002.





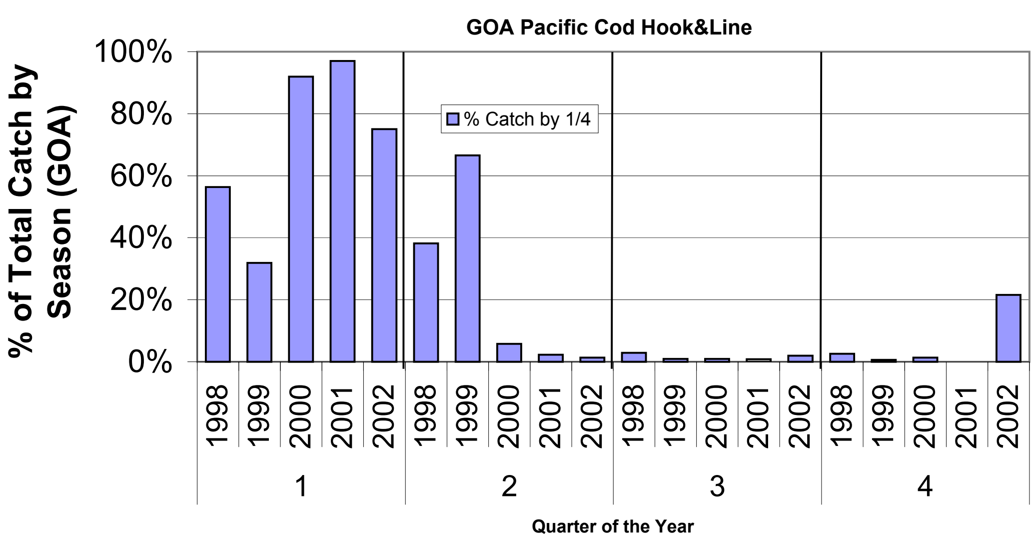
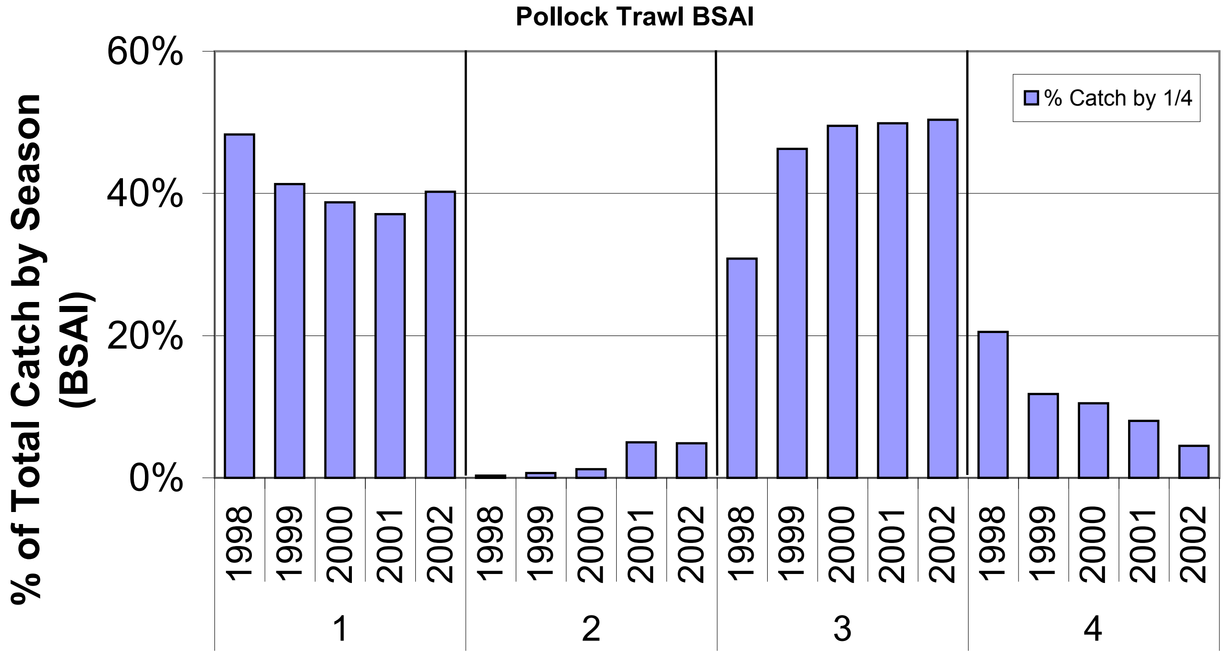


Figure III-6 Percent of the BSAI and GOA annual catch of pollock harvested in each quarter of the year from 1998-2002.



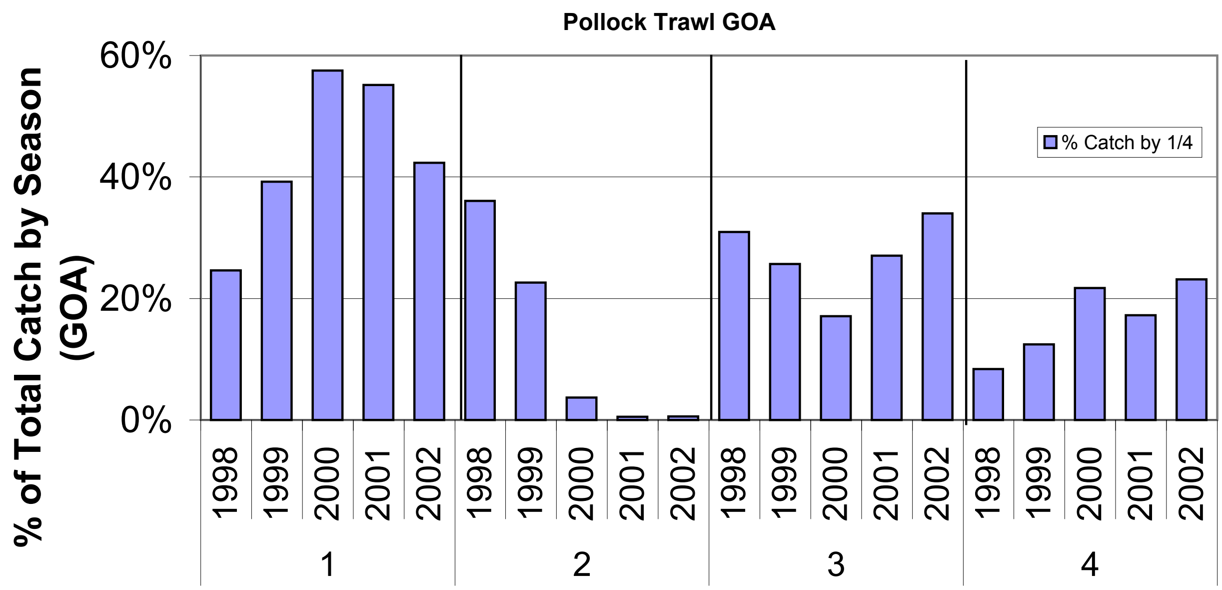
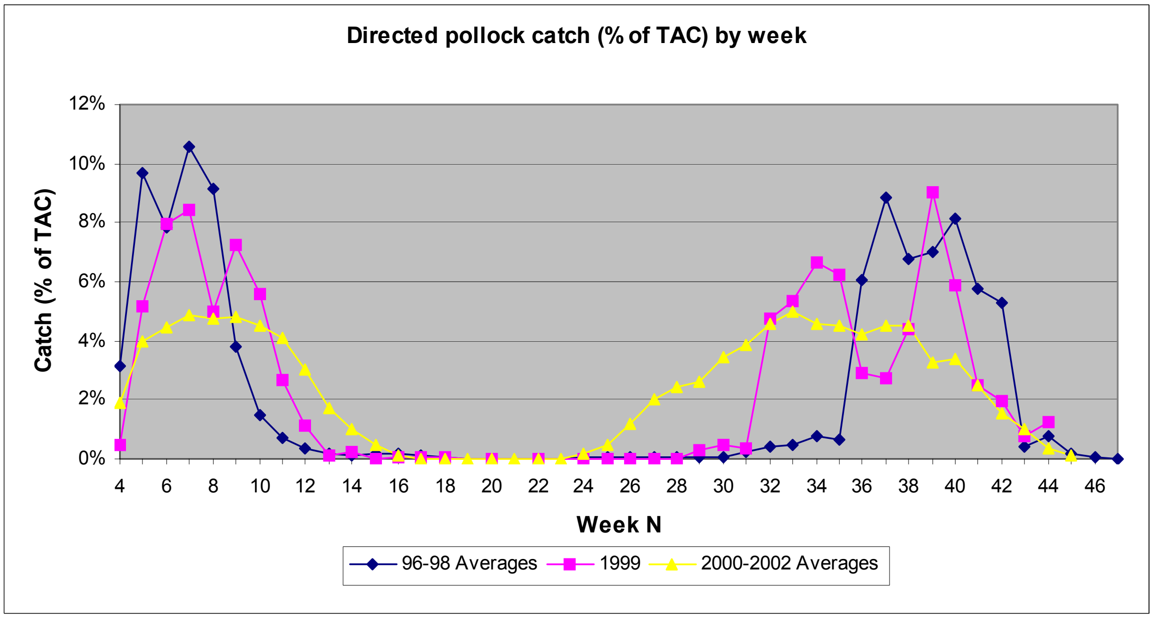


Figure III-7 Weekly catch of pollock in the BSAI from 1996-2002. The first figure depicts the amount of catch as a percentage of the total annual catch taken by week. The second figure displays the amount of catch in mt by week (source: APA).



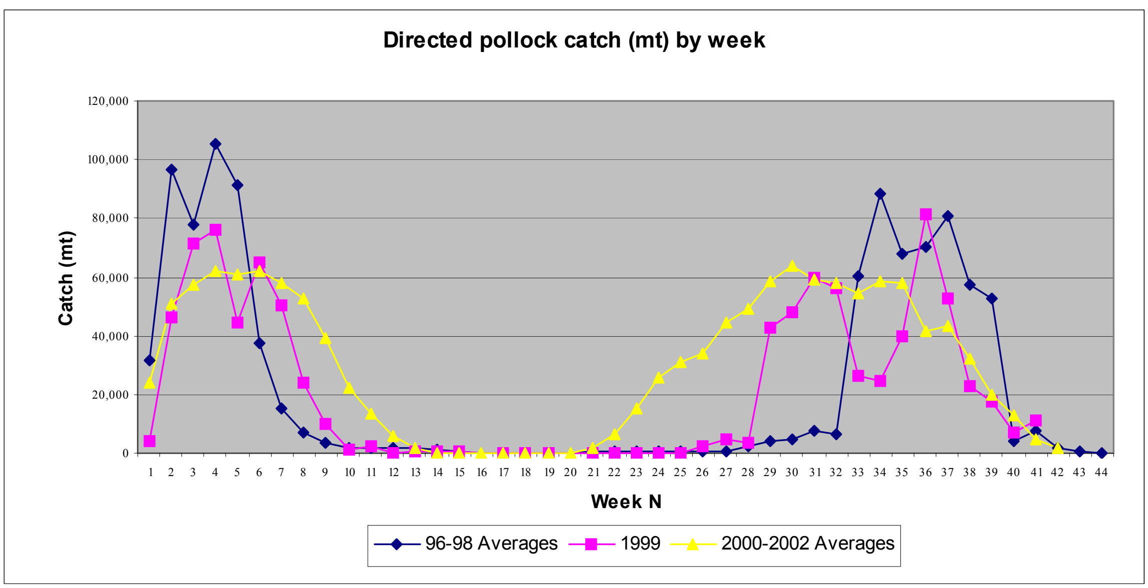
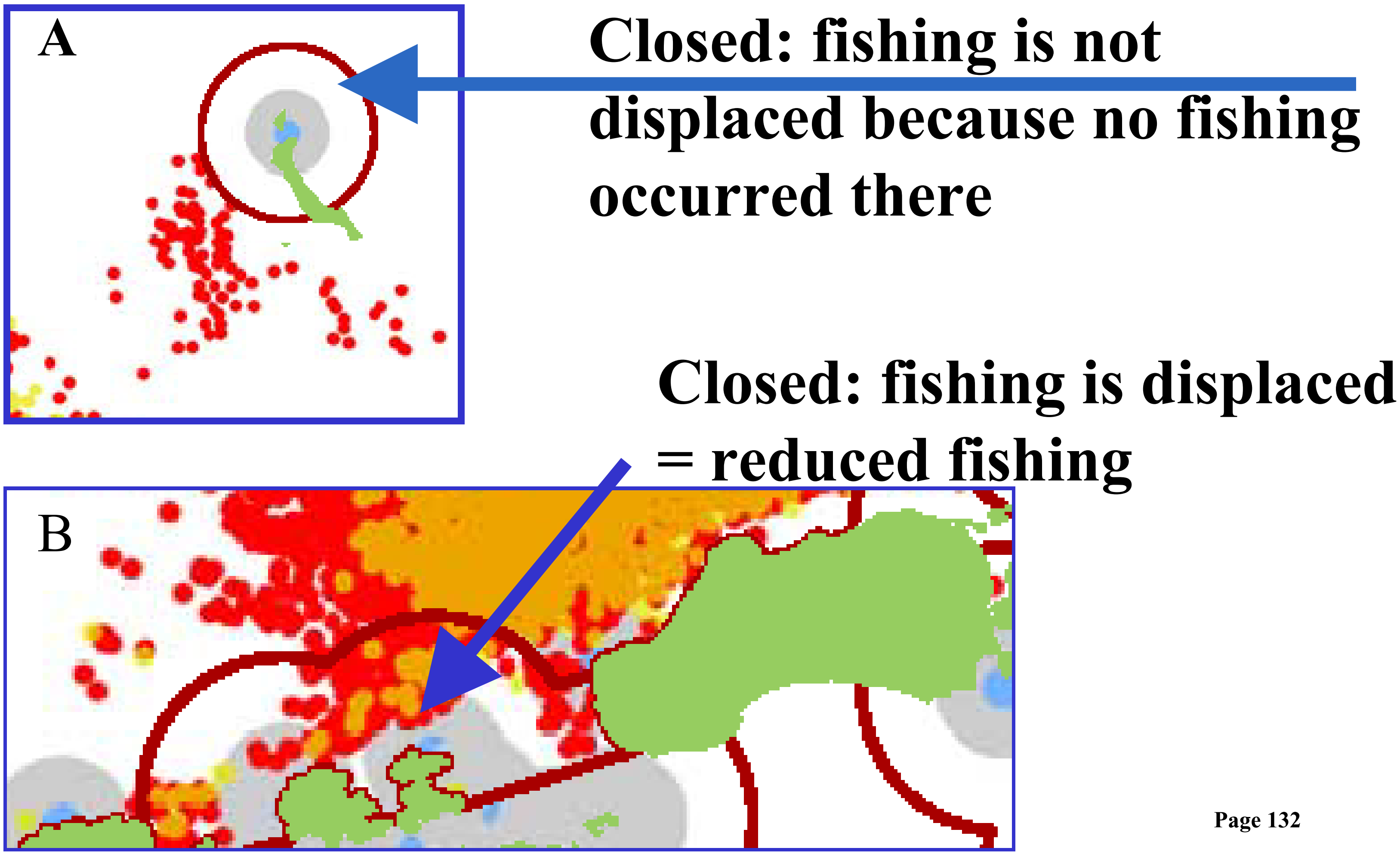


Figure III-8. Schematic of the information contained in Table III-6. Figure A below represents areas that may have been closed under the 2001 measures but did not displace any fishing as no trawls occurred in the closed area, whereas Figure B below shows an area that had substantial fishing which was closed resulting in fishing that was displaced and traditional fishing areas that were closed.



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		0-10 nm		10-20 nm		>20 within CH		Outside CH		Group Total
Summer: April - September		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		0-10 nm		10-20 nm		>20 within CH		Outside CH		Group Total
Winter: October - March		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

				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
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

				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
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

				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
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	2,065	2,698	0.5	56.0	17.8	74.3	72.9	65.6	70.5	76.5

				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
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

				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
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

				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
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	68,966	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

				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
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

				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
1992	Pollock	Trawl	4	0	265	4,691	4,956	196	1,102	4,912	5,150	10,686	0.0	2.5	43.9	46.4	1.8	10.3	46.0	48.2
1992	Pollock	Trawl	ALL	2,037	12,077	42,574	56,689	19,611	6,808	52,592	62,318	90,766	2.2	13.3	46.9	62.5	21.6	7.5	57.9	68.7
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	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	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
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	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	1	0	43	0	43	0	43	43	43	43	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1992	Pollock	Longline	2	0	0	0	0	14	0	0	14	14	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0
1992	Pollock	Longline	3	0	29	0	29	0	29	29	29	29	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
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	72	0	72	14	72	72	86	86	0.0	83.3	0.0	83.3	16.7	83.3	83.3	100.0
1992	Pollock	ALL	ALL	2,037	12,149	42,574	56,761	19,625	6,880	52,664	62,405	90,853	2.2	13.4	46.9	62.5	21.6	7.6	58.0	68.7
1992	P. Cod	Trawl	1	336	5,403	31,197	36,936	344	20,679	22,751	36,927	47,718	0.7	11.3	65.4	77.4	0.7	43.3	47.7	77.4
1992	P. Cod	Trawl	2	2	29	2,527	2,558	9	1,817	894	2,559	3,313	0.1	0.9	76.3	77.2	0.3	54.8	27.0	77.2
1992	P. Cod	Trawl	3	28	381	290	698	5	81	676	703	1,648	1.7	23.1	17.6	42.4	0.3	4.9	41.0	42.7
1992	P. Cod	Trawl	4	3	281	692	976	12	171	843	989	1,914	0.2	14.7	36.2	51.0	0.6	8.9	44.1	51.7
1992	P. Cod	Trawl	ALL	369	6,094	34,706	41,169	370	22,748	25,165	41,187	54,593	0.7	11.2	63.6	75.4	0.7	41.7	46.1	75.4
1992	P. Cod	Pot	1	13	2,644	4,558	7,215	980	2,847	6,573	7,370	7,654	0.2	34.5	59.5	94.3	12.8	37.2	85.9	96.3
1992	P. Cod	Pot	2	114	572	194	879	254	706	879	1,084	1,084	10.5	52.7	17.9	81.1	23.4	65.2	81.1	100.0
1992	P. Cod	Pot	3	168	366	387	921	14	425	892	922	952	17.6	38.5	40.7	96.8	1.5	44.7	93.7	96.9
1992	P. Cod	Pot	4	0	42	204	246	0	0	246	246	465	0.0	9.1	43.9	53.0	0.0	0.0	53.0	53.0
1992	P. Cod	Pot	ALL	295	3,625	5,343	9,262	1,248	3,979	8,591	9,623	10,154	2.9	35.7	52.6	91.2	12.3	39.2	84.6	94.8
1992	P. Cod	Longline	1	23	3,180	4,322	7,524	37	4,760	3,339	7,540	13,384	0.2	23.8	32.3	56.2	0.3	35.6	24.9	56.3
1992	P. Cod	Longline	2	41	76	43	160	74	14	152	225	357	11.6	21.2	12.1	44.9	20.8	4.0	42.4	62.9
1992	P. Cod	Longline	3	13	247	107	368	110	105	359	394	1,169	1.1	21.2	9.2	31.4	9.4	9.0	30.7	33.7
1992	P. Cod	Longline	4	0	156	62	218	269	0	218	269	764	0.0	20.4	8.1	28.5	35.2	0.0	28.5	35.2
1992	P. Cod	Longline	ALL	78	3,659	4,534	8,270	490	4,880	4,068	8,427	15,675	0.5	23.3	28.9	52.8	3.1	31.1	26.0	53.8
1992	P. Cod	ALL	ALL	741	13,378	44,582	58,701	2,108	31,606	37,823	59,237	80,422	0.9	16.6	55.4	73.0	2.6	39.3	47.0	73.7
1992	Atka mackerel	Trawl	1	0	6	1,796	1,801	0	1,746	376	1,801	1,820	0.0	0.3	98.7	99.0	0.0	96.0	20.6	99.0
1992	Atka mackerel	Trawl	2	0	2	7,305	7,307	0	7,307	865	7,307	7,310	0.0	0.0	99.9	100.0	0.0	100.0	11.8	100.0
1992	Atka mackerel	Trawl	3	0	4	76	79	0	79	4	79	142	0.0	2.5	53.4	55.9	0.0	55.5	2.7	55.9
1992	Atka mackerel	Trawl	4	0	0	0	0	0	0	0	0	44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	Atka mackerel	Trawl	ALL	0	11	9,176	9,187	0	9,132	1,244	9,187	9,317	0.0	0.1	98.5	98.6	0.0	98.0	13.4	98.6
1992	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	50.3	49.7	100.0	0.0	84.2	100.0	100.0
1992	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	20.7	79.3	0.0	100.0	0.0	100.0	100.0	100.0
1992	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	50.2	49.3	0.6	100.0	0.0	99.4	100.0	100.0
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	0	0	0	0	0	0	0	37.4	61.0	1.5	100.0	0.0	99.3	100.0	100.0
1992	Atka mackerel	Longline	1	0	1	0	1	0	1	0	1	1	0.0	96.9	2.9	99.8	0.0	99.8	25.5	99.8
1992	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
1992	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
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	1	0	1	0	1	0	1	1	0.0	94.4	2.9	97.2	0.0	97.2	24.9	97.2
1992	Atka mackerel	ALL	ALL	0	12	9,176	9,189	0	9,134	1,245	9,189	9,319	0.0	0.1	98.5	98.6	0.0	98.0	13.4	98.6
1992	ALL	ALL	ALL	2,779	25,540	96,332	124,651	21,733	47,619	91,732	130,831	180,593	1.5	14.1	53.3	69.0	12.0	26.4	50.8	72.4
1993	Pollock	Trawl	1	2,789	8,095	20,518	31,402	23,545	3,616	24,331	30,645	31,402	8.9	25.8	65.3	100.0	75.0	11.5	77.5	97.6
1993	Pollock	Trawl	2	3,175	9,884	15,651	28,710	7,908	6,992	18,791	23,857	28,710	11.1	34.4	54.5	100.0	27.5	24.4	65.5	83.1
1993	Pollock	Trawl	3	855	4,964	20,285	26,105	518	8,512	18,488	20,135	26,105	3.3	19.0	77.7	100.0	2.0	32.6	70.8	77.1
1993	Pollock	Trawl	4	0	5,271	17,375	22,646	121	20	14,730	14,735	22,646	0.0	23.3	76.7	100.0	0.5	0.1	65.0	65.1
1993	Pollock	Trawl	ALL	6,820	28,214	73,830	108,863	32,092	19,140	76,340	89,372	108,863	6.3	25.9	67.8	100.0	29.5	17.6	70.1	82.1
1993	Pollock	Pot	1	0	0	9	9	22	0	9	23	23	0.0	0.0	40.4	40.4	91.7	1.4	40.2	97.8

				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
1993	Pollock	Pot	2	0	1	1	2	0	0	2	2	4	0.0	16.6	17.9	34.5	0.0	6.1	34.5	34.5
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	10	11	22	1	11	24	28	0.0	2.6	36.8	39.4	77.2	2.2	39.3	87.8
1993	Pollock	Longline	1	0	2	9	11	1	0	11	11	27	0.1	7.1	33.0	40.3	2.7	1.1	39.9	40.3
1993	Pollock	Longline	2	0	0	1	1	0	0	0	1	4	0.0	0.0	14.5	14.5	0.0	3.5	2.3	32.6
1993	Pollock	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	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
1993	Pollock	Longline	ALL	0	2	9	11	1	0	11	12	31	0.1	6.2	30.7	37.0	2.3	1.4	35.1	39.3
1993	Pollock	ALL	ALL	6,820	28,217	73,849	108,886	32,114	19,141	76,362	89,409	108,922	6.3	25.9	67.8	100.0	29.5	17.6	70.1	82.1
1993	P. Cod	Trawl	1	13	5,904	8,963	14,880	368	2,235	12,915	14,917	31,452	0.0	18.8	28.5	47.3	1.2	7.1	41.1	47.4
1993	P. Cod	Trawl	2	133	405	449	987	82	401	767	987	2,026	6.6	20.0	22.2	48.7	4.1	19.8	37.9	48.7
1993	P. Cod	Trawl	3	65	430	281	776	10	35	709	776	1,949	3.3	22.1	14.4	39.8	0.5	1.8	36.4	39.8
1993	P. Cod	Trawl	4	3	647	900	1,550	0	707	921	1,550	2,379	0.1	27.2	37.8	65.2	0.0	29.7	38.7	65.2
1993	P. Cod	Trawl	ALL	214	7,386	10,593	18,193	460	3,379	15,312	18,230	37,806	0.6	19.5	28.0	48.1	1.2	8.9	40.5	48.2
1993	P. Cod	Pot	1	0	898	3,598	4,496	3,116	1,419	3,826	6,693	7,423	0.0	12.1	48.5	60.6	42.0	19.1	51.5	90.2
1993	P. Cod	Pot	2	5	1,005	343	1,352	0	342	1,352	1,352	2,285	0.2	44.0	15.0	59.2	0.0	15.0	59.2	59.2
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	5	1,902	3,941	5,847	3,116	1,760	5,177	8,045	9,708	0.0	19.6	40.6	60.2	32.1	18.1	53.3	82.9
1993	P. Cod	Longline	1	70	1,239	4,279	5,588	0	96	5,554	5,588	7,578	0.9	16.4	56.5	73.7	0.0	1.3	73.3	73.7
1993	P. Cod	Longline	2	0	6	208	214	191	135	59	405	1,385	0.0	0.4	15.0	15.4	13.8	9.8	4.3	29.2
1993	P. Cod	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	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
1993	P. Cod	Longline	ALL	70	1,245	4,487	5,802	191	232	5,613	5,993	8,962	0.8	13.9	50.1	64.7	2.1	2.6	62.6	66.9
1993	P. Cod	ALL	ALL	289	10,534	19,020	29,842	3,767	5,372	26,103	32,267	56,476	0.5	18.7	33.7	52.8	6.7	9.5	46.2	57.1
1993	Atka mackerel	Trawl	1	0	117	1,835	1,952	0	1,951	1	1,952	1,974	0.0	5.9	92.9	98.9	0.0	98.8	0.1	98.9
1993	Atka mackerel	Trawl	2	0	53	1,664	1,716	0	1,716	0	1,716	1,910	0.0	2.8	87.1	89.9	0.0	89.9	0.0	89.9
1993	Atka mackerel	Trawl	3	0	1	113	113	0	101	13	113	204	0.0	0.4	55.3	55.7	0.0	49.4	6.3	55.7
1993	Atka mackerel	Trawl	4	0	0	564	564	0	564	0	564	1,058	0.0	0.0	53.3	53.3	0.0	53.3	0.0	53.3
1993	Atka mackerel	Trawl	ALL	0	170	4,175	4,346	0	4,332	14	4,346	5,145	0.0	3.3	81.2	84.5	0.0	84.2	0.3	84.5
1993	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1993	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
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	0	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1993	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
1993	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
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	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	Atka mackerel	ALL	ALL	0	171	4,175	4,346	0	4,332	15	4,346	5,146	0.0	3.3	81.1	84.5	0.0	84.2	0.3	84.5
1993	ALL	ALL	ALL	7,108	38,921	97,045	143,074	35,881	28,845	102,480	126,022	170,544	4.2	22.8	56.9	83.9	21.0	16.9	60.1	73.9
1994	Pollock	Trawl	1	246	7,371	14,874	22,491	10,253	5,001	21,811	26,385	33,437	0.7	22.0	44.5	67.3	30.7	15.0	65.2	78.9
1994	Pollock	Trawl	2	1,030	7,351	11,286	19,668	1,514	8,854	17,328	20,146	21,070	4.9	34.9	53.6	93.3	7.2	42.0	82.2	95.6
1994	Pollock	Trawl	3	518	6,822	8,356	15,695	8,434	3,917	14,539	19,384	22,128	2.3	30.8	37.8	70.9	38.1	17.7	65.7	87.6
1994	Pollock	Trawl	4	0	1,357	18,466	19,823	480	984	19,575	20,302	30,603	0.0	4.4	60.3	64.8	1.6	3.2	64.0	66.3
1994	Pollock	Trawl	ALL	1,794	22,902	52,982	77,677	20,682	18,756	73,253	86,216	107,238	1.7	21.4	49.4	72.4	19.3	17.5	68.3	80.4
1994	Pollock	Pot	1	0	5	21	26	1	11	26	26	26	0.0	17.8	82.0	99.8	2.3	40.8	99.7	99.9
1994	Pollock	Pot	2	0	29	0	29	0	10	29	29	29	0.0	99.2	0.5	99.7	0.0	35.7	99.7	99.7
1994	Pollock	Pot	3	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1994	Pollock	Pot	4	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0

				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
1994	Pollock	Pot	ALL	0	33	21	55	1	21	55	55	55	0.0	61.0	38.8	99.7	1.1	38.1	99.7	99.8
1994	Pollock	Longline	1	0	4	8	12	6	5	10	12	20	0.0	18.3	40.9	59.1	28.2	25.0	50.9	58.7
1994	Pollock	Longline	2	0	0	13	13	4	13	6	17	20	0.0	2.1	63.8	65.9	21.5	64.7	27.5	87.1
1994	Pollock	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
1994	Pollock	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	100.0
1994	Pollock	Longline	ALL	0	4	21	25	10	18	15	29	40	0.0	10.1	52.6	62.7	24.7	44.9	39.0	73.2
1994	Pollock	ALL	ALL	1,794	22,939	53,024	77,757	20,692	18,795	73,323	86,300	107,333	1.7	21.4	49.4	72.4	19.3	17.5	68.3	80.4
1994	P. Cod	Trawl	1	845	3,957	10,254	15,056	780	6,323	10,363	15,263	81,854	1.0	4.8	12.5	18.4	1.0	7.7	12.7	18.6
1994	P. Cod	Trawl	2	5	150	387	542	175	414	451	707	4,466	0.1	3.4	8.7	12.1	3.9	9.3	10.1	15.8
1994	P. Cod	Trawl	3	18	352	1,185	1,555	240	885	1,189	1,691	12,127	0.1	2.9	9.8	12.8	2.0	7.3	9.8	13.9
1994	P. Cod	Trawl	4	0	315	770	1,085	257	342	854	1,325	12,033	0.0	2.6	6.4	9.0	2.1	2.8	7.1	11.0
1994	P. Cod	Trawl	ALL	868	4,774	12,597	18,239	1,451	7,964	12,857	18,986	110,479	0.8	4.3	11.4	16.5	1.3	7.2	11.6	17.2
1994	P. Cod	Pot	1	44	1,479	5,861	7,385	1,918	1,853	7,236	7,395	7,757	0.6	19.1	75.6	95.2	24.7	23.9	93.3	95.3
1994	P. Cod	Pot	2	130	693	334	1,157	0	341	1,136	1,157	1,312	9.9	52.8	25.5	88.2	0.0	26.0	86.6	88.2
1994	P. Cod	Pot	3	0	74	0	74	0	74	74	74	74	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1994	P. Cod	Pot	4	0	18	0	18	0	18	18	18	18	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1994	P. Cod	Pot	ALL	174	2,264	6,195	8,634	1,918	2,286	8,465	8,644	9,160	1.9	24.7	67.6	94.3	20.9	25.0	92.4	94.4
1994	P. Cod	Longline	1	0	1,311	2,480	3,791	180	2,313	2,573	3,791	5,810	0.0	22.6	42.7	65.3	3.1	39.8	44.3	65.2
1994	P. Cod	Longline	2	0	34	479	513	250	455	264	736	940	0.0	3.6	51.0	54.6	26.6	48.3	28.1	78.3
1994	P. Cod	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
1994	P. Cod	Longline	4	0	0	27	27	27	0	0	27	27	0.0	0.0	100.0	100.0	99.3	0.0	0.0	100.0
1994	P. Cod	Longline	ALL	0	1,345	2,987	4,332	457	2,768	2,837	4,555	6,778	0.0	19.8	44.1	63.9	6.7	40.8	41.9	67.2
1994	P. Cod	ALL	ALL	1,042	8,383	21,779	31,205	3,826	13,018	24,159	32,184	126,417	0.8	6.6	17.2	24.7	3.0	10.3	19.1	25.5
1994	Atka mackerel	Trawl	1	0	59	2,481	2,539	0	2,539	0	2,539	2,590	0.0	2.3	95.8	98.0	0.0	98.0	0.0	98.0
1994	Atka mackerel	Trawl	2	0	0	0	0	0	0	0	0	0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	100.0
1994	Atka mackerel	Trawl	3	0	8	178	187	0	187	0	187	257	0.0	3.3	69.6	72.8	0.0	72.8	0.0	72.8
1994	Atka mackerel	Trawl	4	0	0	488	488	0	488	0	488	690	0.0	0.0	70.7	70.7	0.0	70.7	0.1	70.7
1994	Atka mackerel	Trawl	ALL	0	67	3,147	3,214	0	3,214	1	3,214	3,537	0.0	1.9	89.0	90.9	0.0	90.9	0.0	90.9
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	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1994	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
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	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1994	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	0.0	17.0	17.0	0.0	0.0	17.0	17.0
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	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	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	0	0	0	0	0	0	0	0	0.0	0.0	17.0	17.0	0.0	0.0	17.0	17.0
1994	Atka mackerel	ALL	ALL	0	67	3,147	3,214	0	3,214	1	3,214	3,537	0.0	1.9	89.0	90.9	0.0	90.9	0.0	90.9
1994	ALL	ALL	ALL	2,836	31,389	77,950	112,176	24,518	35,027	97,482	121,699	237,287	1.2	13.2	32.9	47.3	10.3	14.8	41.1	51.3
1995	Pollock	Trawl	1	274	3,439	10,958	14,671	3,915	4,984	14,087	15,440	16,957	1.6	20.3	64.6	86.5	23.1	29.4	83.1	91.1
1995	Pollock	Trawl	2	57	2,366	8,425	10,848	2,533	3,199	7,491	12,167	18,746	0.3	12.6	44.9	57.9	13.5	17.1	40.0	64.9
1995	Pollock	Trawl	3	0	1,134	8,020	9,154	3,015	3,327	5,119	11,765	15,530	0.0	7.3	51.6	58.9	19.4	21.4	33.0	75.8
1995	Pollock	Trawl	4	0	289	13,461	13,750	225	2,052	11,706	13,969	21,298	0.0	1.4	63.2	64.6	1.1	9.6	55.0	65.6
1995	Pollock	Trawl	ALL	331	7,228	40,864	48,423	9,689	13,562	38,403	53,341	72,532	0.5	10.0	56.3	66.8	13.4	18.7	52.9	73.5
1995	Pollock	Pot	1	0	4	0	4	0	4	4	4	4	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1995	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
1995	Pollock	Pot	3	0	0	0	0	3	0	0	3	3	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0
1995	Pollock	Pot	4	0	0	0	0	3	0	0	3	3	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0
1995	Pollock	Pot	ALL	0	4	0	4	5	4	4	9	9	0.0	42.9	0.0	42.9	57.1	42.9	42.9	100.0
1995	Pollock	Longline	1	0	0	0	0	0	0	0	0	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	Pollock	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

				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
1995	Pollock	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
1995	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
1995	Pollock	Longline	ALL	0	0	0	0	0	0	0	0	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	Pollock	ALL	ALL	331	7,232	40,864	48,427	9,694	13,566	38,407	53,350	72,616	0.5	10.0	56.3	66.7	13.4	18.7	52.9	73.5
1995	P. Cod	Trawl	1	238	7,790	17,097	25,125	160	14,026	25,125	25,125	35,780	0.7	21.8	47.8	70.2	0.4	39.2	70.2	70.2
1995	P. Cod	Trawl	2	2	214	362	578	195	99	736	736	1,295	0.1	16.6	28.0	44.7	15.1	7.7	56.8	56.9
1995	P. Cod	Trawl	3	9	176	217	402	36	105	438	438	1,038	0.9	17.0	20.9	38.8	3.4	10.1	42.2	42.2
1995	P. Cod	Trawl	4	69	382	1,040	1,491	174	77	1,655	1,655	3,762	1.8	10.2	27.6	39.6	4.6	2.1	44.0	44.0
1995	P. Cod	Trawl	ALL	319	8,563	18,716	27,597	565	14,308	27,954	27,954	41,875	0.8	20.4	44.7	65.9	1.3	34.2	66.8	66.8
1995	P. Cod	Pot	1	423	2,940	5,210	8,573	5,589	927	10,140	10,140	13,695	3.1	21.5	38.0	62.6	40.8	6.8	74.0	74.0
1995	P. Cod	Pot	2	166	312	474	952	0	846	973	973	1,538	10.8	20.3	30.8	61.9	0.0	55.0	63.3	63.3
1995	P. Cod	Pot	3	0	60	4	63	90	60	154	154	158	0.0	37.8	2.3	40.0	57.4	37.8	97.4	97.4
1995	P. Cod	Pot	4	14	393	101	508	270	383	654	654	664	2.1	59.2	15.2	76.5	40.7	57.7	98.4	98.4
1995	P. Cod	Pot	ALL	603	3,705	5,789	10,096	5,950	2,216	11,921	11,921	16,055	3.8	23.1	36.1	62.9	37.1	13.8	74.2	74.2
1995	P. Cod	Longline	1	0	831	4,658	5,490	17	2,406	3,223	5,496	9,475	0.0	8.8	49.2	57.9	0.2	25.4	34.0	58.0
1995	P. Cod	Longline	2	0	3	84	87	0	0	87	87	1,201	0.0	0.2	7.0	7.2	0.0	0.0	7.2	7.2
1995	P. Cod	Longline	3	0	5	4	10	0	9	6	10	88	0.0	6.1	5.0	11.1	0.0	9.7	7.1	11.1
1995	P. Cod	Longline	4	1	38	73	112	0	97	42	112	213	0.2	18.0	34.2	52.4	0.0	45.5	19.7	52.4
1995	P. Cod	Longline	ALL	1	877	4,820	5,698	17	2,511	3,359	5,704	10,978	0.0	8.0	43.9	51.9	0.2	22.9	30.6	52.0
1995	P. Cod	ALL	ALL	922	13,145	29,324	43,391	6,532	19,035	43,233	45,579	68,907	1.3	19.1	42.6	63.0	9.5	27.6	62.7	66.1
1995	Atka mackerel	Trawl	1	0	23	19	41	0	7	37	41	83	0.0	27.3	22.4	49.7	0.0	8.1	44.9	49.7
1995	Atka mackerel	Trawl	2	0	0	30	30	0	28	2	30	57	0.0	0.3	51.6	51.9	0.0	49.1	2.8	51.9
1995	Atka mackerel	Trawl	3	0	0	233	233	0	215	7	233	296	0.0	0.0	78.8	78.8	0.0	72.4	2.4	78.8
1995	Atka mackerel	Trawl	4	0	0	33	33	0	33	0	33	262	0.0	0.1	12.7	12.8	0.0	12.7	0.1	12.8
1995	Atka mackerel	Trawl	ALL	0	23	315	338	0	283	46	338	698	0.0	3.3	45.1	48.4	0.0	40.5	6.7	48.4
1995	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	1	0.0	7.3	4.0	11.3	0.0	7.3	11.3	11.3
1995	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	147.9	100.0	100.0	100.0
1995	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1995	Atka mackerel	Pot	4	0	0	0	0	0	0	0	0	0	26.2	31.3	0.0	57.6	0.0	57.6	57.6	57.6
1995	Atka mackerel	Pot	ALL	0	0	0	0	0	0	0	0	1	2.2	14.0	3.5	19.7	2.5	16.2	19.7	19.7
1995	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	90.8	2.8	93.6	0.0	91.5	2.1	93.6
1995	Atka mackerel	Longline	2	0	0	0	0	0	0	0	0	0	0.0	0.0	7.4	7.4	0.0	0.0	7.4	7.4
1995	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
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	0	0	0	0	0	0	0	0	0.0	88.6	2.9	91.5	0.0	89.3	2.2	91.5
1995	Atka mackerel	ALL	ALL	0	23	315	338	0	283	47	338	699	0.0	3.3	45.0	48.3	0.0	40.4	6.7	48.3
1995	ALL	ALL	ALL	1,253	20,401	70,503	92,156	16,227	32,884	81,686	99,267	142,223	0.9	14.3	49.6	64.8	11.4	23.1	57.4	69.8
1996	Pollock	Trawl	1	130	4,323	11,334	15,787	3,757	3,521	14,472	16,806	17,945	0.7	24.1	63.2	88.0	20.9	19.6	80.6	93.7
1996	Pollock	Trawl	2	500	743	3,695	4,938	1,209	676	4,362	6,031	7,975	6.3	9.3	46.3	61.9	15.2	8.5	54.7	75.6
1996	Pollock	Trawl	3	233	4,818	6,950	12,001	3,902	1,711	11,645	14,179	23,009	1.0	20.9	30.2	52.2	17.0	7.4	50.6	61.6
1996	Pollock	Trawl	4	35	322	1,009	1,365	947	205	1,337	1,703	2,265	1.5	14.2	44.5	60.3	41.8	9.1	59.0	75.2
1996	Pollock	Trawl	ALL	898	10,206	22,987	34,091	9,815	6,112	31,816	38,720	51,194	1.8	19.9	44.9	66.6	19.2	11.9	62.1	75.6
1996	Pollock	Pot	1	0	1	3	4	6	1	4	7	8	1.7	6.9	39.8	48.4	72.2	6.7	46.3	91.3
1996	Pollock	Pot	2	0	0	0	0	0	0	0	0	0	16.4	32.6	29.4	78.3	0.0	78.3	49.0	78.3
1996	Pollock	Pot	3	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1996	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
1996	Pollock	Pot	ALL	0	1	3	4	6	1	4	8	8	2.1	8.1	39.3	49.4	70.1	8.9	46.7	91.0
1996	Pollock	Longline	1	0	4	17	21	2	11	15	23	55	0.0	7.5	31.1	38.6	3.6	19.9	27.3	42.1
1996	Pollock	Longline	2	0	0	0	0	0	0	0	0	2	0.0	0.0	7.2	7.2	0.0	0.0	7.2	7.2
1996	Pollock	Longline	3	0	0	0	0	0	0	0	0	3	0.0	0.0	8.3	8.3	0.0	0.0	8.3	8.3
1996	Pollock	Longline	4	0	0	0	0	0	0	0	0	1	0.0	0.0	14.1	14.1	0.0	0.0	0.0	14.1
1996	Pollock	Longline	ALL	0	4	18	22	2	11	15	24	61	0.0	6.8	29.0	35.8	3.3	18.0	25.3	39.0

				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
1996	Pollock	ALL	ALL	898	10,210	23,008	34,117	9,823	6,124	31,836	38,751	51,263	1.8	19.9	44.9	66.6	19.2	11.9	62.1	75.6
1996	P. Cod	Trawl	1	163	6,680	20,018	26,861	221	17,465	12,611	26,861	38,820	0.4	17.2	51.6	69.2	0.6	45.0	32.5	69.2
1996	P. Cod	Trawl	2	59	299	203	561	1,011	119	523	1,471	2,260	2.6	13.2	9.0	24.8	44.7	5.3	23.1	65.1
1996	P. Cod	Trawl	3	12	310	739	1,062	318	435	803	1,348	3,007	0.4	10.3	24.6	35.3	10.6	14.4	26.7	44.8
1996	P. Cod	Trawl	4	16	399	659	1,074	351	249	1,016	1,329	1,903	0.9	20.9	34.6	56.4	18.4	13.1	53.4	69.8
1996	P. Cod	Trawl	ALL	250	7,688	21,620	29,558	1,900	18,267	14,954	31,010	45,991	0.5	16.7	47.0	64.3	4.1	39.7	32.5	67.4
1996	P. Cod	Pot	1	213	1,158	5,425	6,796	3,858	2,481	6,221	8,979	10,759	2.0	10.8	50.4	63.2	35.9	23.1	57.8	83.4
1996	P. Cod	Pot	2	105	367	93	566	0	566	494	566	684	15.4	53.7	13.6	82.7	0.0	82.7	72.2	82.7
1996	P. Cod	Pot	3	95	412	0	507	0	507	507	507	508	18.7	81.1	0.0	99.8	0.0	99.8	99.8	99.8
1996	P. Cod	Pot	4	0	88	0	89	0	89	89	89	89	0.2	99.8	0.0	100.0	0.0	100.0	100.0	100.0
1996	P. Cod	Pot	ALL	413	2,026	5,518	7,958	3,858	3,643	7,310	10,140	12,040	3.4	16.8	45.8	66.1	32.0	30.3	60.7	84.2
1996	P. Cod	Longline	1	1	1,739	2,831	4,572	821	2,170	2,794	5,131	9,559	0.0	18.2	29.6	47.8	8.6	22.7	29.2	53.7
1996	P. Cod	Longline	2	0	3	61	64	0	21	43	64	461	0.0	0.7	13.2	13.9	0.0	4.6	9.4	13.9
1996	P. Cod	Longline	3	0	2	1	3	0	2	3	3	90	0.3	2.5	0.9	3.6	0.0	1.9	2.8	3.6
1996	P. Cod	Longline	4	0	0	0	0	0	0	0	0	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1996	P. Cod	Longline	ALL	1	1,745	2,893	4,639	821	2,193	2,840	5,199	10,196	0.0	17.1	28.4	45.5	8.1	21.5	27.9	51.0
1996	P. Cod	ALL	ALL	665	11,459	30,031	42,155	6,579	24,102	25,104	46,348	68,227	1.0	16.8	44.0	61.8	9.6	35.3	36.8	67.9
1996	Atka mackerel	Trawl	1	0	0	8	9	0	8	5	9	9	0.0	3.3	96.0	99.3	0.0	94.1	58.4	99.3
1996	Atka mackerel	Trawl	2	0	0	135	135	0	135	1	135	229	0.0	0.0	58.9	58.9	0.0	58.9	0.2	58.9
1996	Atka mackerel	Trawl	3	0	269	843	1,112	0	1,091	1	1,112	1,145	0.0	23.5	73.6	97.1	0.0	95.2	0.1	97.1
1996	Atka mackerel	Trawl	4	0	0	29	29	0	24	23	29	203	0.0	0.0	14.2	14.2	0.0	12.0	11.6	14.2
1996	Atka mackerel	Trawl	ALL	0	269	1,015	1,285	0	1,258	30	1,285	1,586	0.0	17.0	64.0	81.0	0.0	79.3	1.9	81.0
1996	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
1996	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
1996	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
1996	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
1996	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
1996	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	66.7	33.3	100.0	0.0	0.0	100.0	100.0
1996	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
1996	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
1996	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
1996	Atka mackerel	Longline	ALL	0	0	0	0	0	0	0	0	0	0.0	66.7	33.3	100.0	0.0	0.0	100.0	100.0
1996	Atka mackerel	ALL	ALL	0	269	1,015	1,285	0	1,258	31	1,285	1,586	0.0	17.0	64.0	81.0	0.0	79.3	1.9	81.0
1996	ALL	ALL	ALL	1,563	21,939	54,055	77,557	16,402	31,485	56,970	86,384	121,076	1.3	18.1	44.6	64.1	13.5	26.0	47.1	71.3
1997	Pollock	Trawl	1	543	7,942	18,553	27,038	8,356	4,765	23,470	29,592	33,037	1.6	24.0	56.2	81.8	25.3	14.4	71.0	89.6
1997	Pollock	Trawl	2	1,430	7,848	4,889	14,167	6,641	34	14,163	16,406	16,586	8.6	47.3	29.5	85.4	40.0	0.2	85.4	98.9
1997	Pollock	Trawl	3	532	8,306	10,382	19,220	4,931	614	17,031	21,918	39,530	1.3	21.0	26.3	48.6	12.5	1.6	43.1	55.4
1997	Pollock	Trawl	4	6	336	328	670	129	87	670	761	886	0.7	37.9	37.0	75.6	14.5	9.9	75.6	85.8
1997	Pollock	Trawl	ALL	2,511	24,431	34,152	61,095	20,056	5,500	55,333	68,676	90,038	2.8	27.1	37.9	67.9	22.3	6.1	61.5	76.3
1997	Pollock	Pot	1	0	1	1	1	1	0	1	1	15	0.1	3.5	5.5	9.1	3.5	0.1	9.1	9.1
1997	Pollock	Pot	2	0	0	0	0	0	0	0	0	0	0.0	85.7	0.0	85.7	0.0	85.7	85.7	85.7
1997	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
1997	Pollock	Pot	4	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	24.6	100.0	100.0
1997	Pollock	Pot	ALL	0	1	1	2	1	0	2	2	15	0.1	6.3	5.3	11.7	3.4	2.7	11.7	11.7
1997	Pollock	Longline	1	0	15	8	24	0	20	19	24	29	0.0	53.4	29.3	82.7	0.0	68.9	65.5	82.7
1997	Pollock	Longline	2	0	0	0	0	0	0	0	0	1	0.0	19.7	1.5	21.2	0.0	1.6	19.6	21.2
1997	Pollock	Longline	3	0	0	0	0	0	0	0	0	44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	Pollock	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	100.0	100.0	0.0	0.0	100.0	100.0
1997	Pollock	Longline	ALL	0	16	9	24	0	20	19	24	74	0.0	21.2	11.5	32.7	0.0	27.0	25.9	32.7
1997	Pollock	ALL	ALL	2,511	24,448	34,161	61,121	20,057	5,520	55,354	68,702	90,127	2.8	27.1	37.9	67.8	22.3	6.1	61.4	76.2
1997	P. Cod	Trawl	1	2,435	11,205	13,987	27,627	960	12,256	23,189	27,627	36,603	6.7	30.6	38.2	75.5	2.6	33.5	63.4	75.5
1997	P. Cod	Trawl	2	30	375	722	1,127	754	116	1,055	1,683	2,470	1.2	15.2	29.2	45.6	30.5	4.7	42.7	68.1

				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
1997	P. Cod	Trawl	3	112	421	575	1,108	408	170	993	1,322	2,562	4.4	16.4	22.4	43.2	15.9	6.6	38.7	51.6
1997	P. Cod	Trawl	4	48	519	1,891	2,458	388	49	2,399	2,673	6,770	0.7	7.7	27.9	36.3	5.7	0.7	35.4	39.5
1997	P. Cod	Trawl	ALL	2,625	12,520	17,175	32,319	2,510	12,591	27,635	33,304	48,405	5.4	25.9	35.5	66.8	5.2	26.0	57.1	68.8
1997	P. Cod	Pot	1	78	1,272	1,976	3,326	357	247	3,199	3,326	5,700	1.4	22.3	34.7	58.3	6.3	4.3	56.1	58.4
1997	P. Cod	Pot	2	0	1,794	194	1,988	0	1,970	1,874	1,988	2,196	0.0	81.7	8.8	90.5	0.0	89.7	85.3	90.5
1997	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
1997	P. Cod	Pot	4	316	716	0	1,033	0	885	1,033	1,169	1,169	27.1	61.3	0.0	88.3	0.0	75.7	88.3	100.0
1997	P. Cod	Pot	ALL	394	3,782	2,170	6,346	357	3,102	6,106	6,483	9,065	4.3	41.7	23.9	70.0	3.9	34.2	67.4	71.5
1997	P. Cod	Longline	1	0	1,350	6,253	7,603	0	3,177	4,594	7,603	10,349	0.0	13.0	60.4	73.5	0.0	30.7	44.4	73.5
1997	P. Cod	Longline	2	17	30	8	55	0	17	41	55	342	5.1	8.7	2.4	16.1	0.0	4.9	12.0	16.1
1997	P. Cod	Longline	3	0	0	6	6	2	6	0	8	193	0.0	0.0	3.0	3.0	1.2	3.0	0.0	4.2
1997	P. Cod	Longline	4	10	18	3	31	0	18	31	31	93	10.3	19.9	2.9	33.1	0.0	19.9	33.1	33.1
1997	P. Cod	Longline	ALL	27	1,398	6,269	7,694	2	3,218	4,666	7,697	10,977	0.2	12.7	57.1	70.1	0.0	29.3	42.5	70.1
1997	P. Cod	ALL	ALL	3,046	17,700	25,614	46,360	2,870	18,911	38,407	47,484	68,448	4.4	25.9	37.4	67.7	4.2	27.6	56.1	69.4
1997	Atka mackerel	Trawl	1	0	1	1	1	0	0	1	1	1	0.0	36.0	53.2	89.2	0.9	23.9	88.0	89.2
1997	Atka mackerel	Trawl	2	0	2	0	2	0	0	2	2	5	0.0	31.3	0.0	31.3	0.0	0.0	31.3	31.3
1997	Atka mackerel	Trawl	3	0	0	319	319	0	263	125	319	321	0.0	0.0	99.6	99.6	0.0	82.0	39.0	99.6
1997	Atka mackerel	Trawl	4	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0
1997	Atka mackerel	Trawl	ALL	0	2	320	322	0	263	128	322	327	0.0	0.7	97.7	98.4	0.0	80.4	39.1	98.4
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	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1997	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	Atka mackerel	Pot	4	0	1	0	1	0	1	1	1	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	Atka mackerel	Pot	ALL	0	1	0	1	0	1	1	1	1	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1997	Atka mackerel	Longline	1	0	0	1	1	0	0	1	1	1	0.0	0.0	96.7	96.7	0.0	0.0	96.7	96.7
1997	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
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	Atka mackerel	Longline	ALL	0	0	1	1	0	0	1	1	1	0.0	0.0	96.2	96.2	0.0	0.0	96.2	96.2
1997	Atka mackerel	ALL	ALL	0	3	321	324	0	264	130	324	329	0.0	0.8	97.6	98.4	0.0	80.2	39.4	98.4
1997	ALL	ALL	ALL	5,557	42,151	60,096	107,804	22,926	24,695	93,891	116,510	158,904	3.5	26.5	37.8	67.8	14.4	15.5	59.1	73.3
1998	Pollock	Trawl	1	825	5,400	15,184	21,408	5,323	656	20,569	22,974	30,781	2.7	17.5	49.3	69.6	17.3	2.1	66.8	74.6
1998	Pollock	Trawl	2	12,039	16,342	10,699	39,079	7,673	2,424	38,478	43,735	45,089	26.7	36.2	23.7	86.7	17.0	5.4	85.3	97.0
1998	Pollock	Trawl	3	493	14,681	11,067	26,241	6,500	139	22,712	29,505	38,692	1.3	37.9	28.6	67.8	16.8	0.4	58.7	76.3
1998	Pollock	Trawl	4	165	3,124	3,104	6,392	4,126	273	3,684	8,441	10,456	1.6	29.9	29.7	61.1	39.5	2.6	35.2	80.7
1998	Pollock	Trawl	ALL	13,521	39,547	40,053	93,121	23,621	3,492	85,443	104,655	125,018	10.8	31.6	32.0	74.5	18.9	2.8	68.3	83.7
1998	Pollock	Pot	1	0	0	2	2	4	0	2	4	5	0.0	1.8	40.6	42.4	79.9	1.4	41.1	83.1
1998	Pollock	Pot	2	0	1	0	1	0	1	1	1	1	0.0	97.1	16.9	114.0	0.0	97.1	97.1	97.1
1998	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
1998	Pollock	Pot	4	0	0	0	0	0	0	0	0	0	51.7	37.9	10.4	100.0	0.0	89.6	89.6	100.0
1998	Pollock	Pot	ALL	0	1	2	4	4	1	4	6	7	1.6	20.6	35.3	57.5	62.7	21.8	53.0	86.2
1998	Pollock	Longline	1	0	24	36	60	1	30	60	60	64	0.0	37.5	57.0	94.5	1.0	46.8	94.5	94.5
1998	Pollock	Longline	2	0	0	0	1	0	0	1	1	1	0.0	5.3	35.6	40.8	0.0	27.8	40.8	40.8
1998	Pollock	Longline	3	0	0	0	0	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	Pollock	Longline	4	0	0	7	7	0	0	0	7	7	0.0	0.5	98.3	98.8	0.0	0.5	0.0	98.8
1998	Pollock	Longline	ALL	0	24	44	68	1	30	61	68	73	0.0	32.8	59.9	92.7	0.9	41.3	83.0	92.7
1998	Pollock	ALL	ALL	13,521	39,572	40,099	93,193	23,626	3,524	85,507	104,729	125,098	10.8	31.6	32.1	74.5	18.9	2.8	68.4	83.7
1998	P. Cod	Trawl	1	58	4,708	8,103	12,869	428	4,858	10,423	13,039	22,295	0.3	21.1	36.3	57.7	1.9	21.8	46.7	58.5
1998	P. Cod	Trawl	2	96	523	1,566	2,185	99	46	2,148	2,242	4,050	2.4	12.9	38.7	54.0	2.5	1.1	53.0	55.3
1998	P. Cod	Trawl	3	31	470	818	1,319	705	118	1,197	1,878	10,076	0.3	4.7	8.1	13.1	7.0	1.2	11.9	18.6
1998	P. Cod	Trawl	4	0	342	1,461	1,804	175	254	1,731	1,940	5,145	0.0	6.7	28.4	35.1	3.4	4.9	33.6	37.7
1998	P. Cod	Trawl	ALL	185	6,044	11,948	18,177	1,407	5,276	15,498	19,099	41,566	0.4	14.5	28.7	43.7	3.4	12.7	37.3	45.9

				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
1998	P. Cod	Pot	1	7	628	3,934	4,569	1,948	628	4,171	5,831	8,751	0.1	7.2	45.0	52.2	22.3	7.2	47.7	66.6
1998	P. Cod	Pot	2	0	406	214	620	0	620	620	620	652	0.0	62.3	32.8	95.2	0.0	95.2	95.2	95.2
1998	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
1998	P. Cod	Pot	4	107	537	436	1,081	0	607	987	1,081	1,120	9.6	47.9	39.0	96.4	0.0	54.2	88.1	96.4
1998	P. Cod	Pot	ALL	114	1,571	4,584	6,269	1,948	1,855	5,778	7,532	10,523	1.1	14.9	43.6	59.6	18.5	17.6	54.9	71.6
1998	P. Cod	Longline	1	0	1,199	3,837	5,036	29	480	5,036	5,036	5,645	0.0	21.2	68.0	89.2	0.5	8.5	89.2	89.2
1998	P. Cod	Longline	2	0	56	428	484	0	72	426	484	3,822	0.0	1.5	11.2	12.7	0.0	1.9	11.1	12.7
1998	P. Cod	Longline	3	9	3	7	19	0	59	23	23	286	3.3	1.0	2.5	6.7	0.0	20.5	8.0	8.0
1998	P. Cod	Longline	4	3	8	207	218	0	56	30	218	263	1.2	2.9	78.7	82.8	0.0	21.4	11.2	82.9
1998	P. Cod	Longline	ALL	12	1,266	4,479	5,757	29	666	5,514	5,761	10,015	0.1	12.6	44.7	57.5	0.3	6.7	55.1	57.5
1998	P. Cod	ALL	ALL	311	8,880	21,012	30,204	3,384	7,797	26,790	32,392	62,105	0.5	14.3	33.8	48.6	5.4	12.6	43.1	52.2
1998	Atka mackerel	Trawl	1	0	0	68	68	0	68	68	68	68	0.0	0.0	99.7	99.7	0.0	99.7	99.8	99.8
1998	Atka mackerel	Trawl	2	0	0	1	1	0	0	1	1	1	39.2	0.0	60.6	99.8	0.2	0.0	100.0	100.0
1998	Atka mackerel	Trawl	3	0	63	182	246	0	246	246	246	248	0.0	25.5	73.7	99.1	0.0	99.1	99.1	99.1
1998	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
1998	Atka mackerel	Trawl	ALL	0	63	251	314	0	313	314	315	317	0.1	19.9	79.2	99.2	0.0	98.9	99.3	99.3
1998	Atka mackerel	Pot	1	0	0	0	0	0	0	0	0	0	0.0	72.0	0.0	72.0	0.0	0.0	72.0	72.0
1998	Atka mackerel	Pot	2	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
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	2.4	45.7	48.0	96.1	0.0	30.4	93.8	96.1
1998	Atka mackerel	Pot	ALL	0	0	0	0	0	0	0	0	0	2.4	46.6	46.9	95.8	0.0	29.7	93.5	95.8
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	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	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	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
1998	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
1998	Atka mackerel	ALL	ALL	0	63	251	314	0	313	315	315	317	0.1	19.9	79.2	99.2	0.0	98.9	99.3	99.3
1998	ALL	ALL	ALL	13,833	48,515	61,363	123,711	27,010	11,634	112,612	137,436	187,520	7.4	25.9	32.7	66.0	14.4	6.2	60.1	73.3
1999	Pollock	Trawl	1	178	2,157	26,861	29,196	13,059	1,422	29,194	32,170	37,427	0.5	5.8	71.8	78.0	34.9	3.8	78.0	86.0
1999	Pollock	Trawl	2	1,603	5,844	9,068	16,515	10,602	2,081	16,250	20,872	21,608	7.4	27.0	42.0	76.4	49.1	9.6	75.2	96.6
1999	Pollock	Trawl	3	0	5,942	8,467	14,410	4,190	307	14,306	17,463	24,513	0.0	24.2	34.5	58.8	17.1	1.3	58.4	71.2
1999	Pollock	Trawl	4	0	478	927	1,405	7,466	0	1,034	8,540	11,880	0.0	4.0	7.8	11.8	62.8	0.0	8.7	71.9
1999	Pollock	Trawl	ALL	1,781	14,422	45,322	61,526	35,317	3,810	60,784	79,044	95,428	1.9	15.1	47.5	64.5	37.0	4.0	63.7	82.8
1999	Pollock	Pot	1	0	0	1	1	1	0	1	3	3	0.0	3.0	39.1	42.2	46.5	12.9	41.0	88.7
1999	Pollock	Pot	2	0	2	0	2	0	2	2	2	2	0.4	96.4	2.7	99.5	0.5	99.5	96.8	100.0
1999	Pollock	Pot	3	0	0	0	0	0	0	0	0	0	0.0	100.0	0.0	100.0	0.0	100.0	100.0	100.0
1999	Pollock	Pot	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
1999	Pollock	Pot	ALL	0	2	1	4	1	3	4	5	5	0.2	45.8	22.4	68.4	25.4	52.4	66.6	93.9
1999	Pollock	Longline	1	0	20	85	105	0	14	105	105	132	0.0	15.1	64.7	79.8	0.0	10.5	79.8	79.8
1999	Pollock	Longline	2	0	7	4	11	0	9	11	11	22	0.0	31.3	18.7	50.0	0.0	43.3	49.3	50.2
1999	Pollock	Longline	3	0	0	0	0	0	0	0	0	3	0.0	0.0	10.7	10.7	0.0	0.0	0.0	10.7
1999	Pollock	Longline	4	0	0	0	0	0	0	0	0	0	58.5	0.0	0.0	58.5	0.0	58.5	58.5	58.5
1999	Pollock	Longline	ALL	0	27	90	117	0	24	116	117	157	0.1	17.1	57.2	74.3	0.0	15.0	74.0	74.4
1999	Pollock	ALL	ALL	1,781	14,451	45,413	61,646	35,319	3,837	60,904	79,165	95,590	1.9	15.1	47.5	64.5	36.9	4.0	63.7	82.8
1999	P. Cod	Trawl	1	190	3,506	7,040	10,737	512	1,850	10,457	10,737	27,166	0.7	12.9	25.9	39.5	1.9	6.8	38.5	39.5
1999	P. Cod	Trawl	2	40	148	263	451	128	151	406	514	1,067	3.8	13.9	24.6	42.3	12.0	14.1	38.0	48.2
1999	P. Cod	Trawl	3	0	152	325	477	33	213	401	503	2,524	0.0	6.0	12.9	18.9	1.3	8.4	15.9	19.9
1999	P. Cod	Trawl	4	0	514	330	844	390	0	824	1,217	6,393	0.0	8.0	5.2	13.2	6.1	0.0	12.9	19.0
1999	P. Cod	Trawl	ALL	230	4,321	7,958	12,509	1,062	2,213	12,088	12,971	37,150	0.6	11.6	21.4	33.7	2.9	6.0	32.5	34.9
1999	P. Cod	Pot	1	0	254	2,136	2,389	1,207	545	2,104	3,595	7,087	0.0	3.6	30.1	33.7	17.0	7.7	29.7	50.7
1999	P. Cod	Pot	2	39	2,508	1,006	3,553	902	2,609	3,307	4,496	6,074	0.6	41.3	16.6	58.5	14.9	43.0	54.4	74.0
1999	P. Cod	Pot	3	53	498	302	853	253	300	805	853	5,391	1.0	9.2	5.6	15.8	4.7	5.6	14.9	15.8

				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
1999	P. Cod	Pot	4	2	159	29	190	120	12	190	208	463	0.4	34.4	6.2	41.0	25.8	2.6	41.0	44.9
1999	P. Cod	Pot	ALL	94	3,419	3,472	6,985	2,481	3,465	6,406	9,152	19,015	0.5	18.0	18.3	36.7	13.0	18.2	33.7	48.1
1999	P. Cod	Longline	1	0	373	1,833	2,206	0	310	2,039	2,236	3,951	0.0	9.4	46.4	55.8	0.0	7.8	51.6	56.6
1999	P. Cod	Longline	2	0	1,282	3,663	4,945	0	2,674	3,089	4,972	8,250	0.0	15.5	44.4	59.9	0.0	32.4	37.4	60.3
1999	P. Cod	Longline	3	0	0	36	36	0	36	1	36	114	0.0	0.1	31.9	32.0	0.0	31.9	1.3	32.0
1999	P. Cod	Longline	4	16	8	15	38	1	22	47	39	76	20.5	10.2	20.1	50.8	0.7	29.2	61.9	51.5
1999	P. Cod	Longline	ALL	16	1,663	5,547	7,225	1	3,042	5,176	7,283	12,390	0.1	13.4	44.8	58.3	0.0	24.5	41.8	58.8
1999	P. Cod	ALL	ALL	340	9,403	16,977	26,720	3,544	8,720	23,670	29,406	68,555	0.5	13.7	24.8	39.0	5.2	12.7	34.5	42.9
1999	Atka mackerel	Trawl	1	0	0	0	0	0	0	0	0	1,513	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Atka mackerel	Trawl	2	74	8	0	82	0	0	82	82	870	8.5	1.0	0.0	9.5	0.0	0.0	9.5	9.5
1999	Atka mackerel	Trawl	3	0	3	4	7	0	7	3	7	1,059	0.0	0.2	0.4	0.6	0.0	0.6	0.2	0.6
1999	Atka mackerel	Trawl	4	0	0	0	0	0	0	0	0	434	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	Atka mackerel	Trawl	ALL	74	11	4	89	0	7	85	89	3,877	1.9	0.3	0.1	2.3	0.0	0.2	2.2	2.3
1999	Atka mackerel	Pot	1	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
1999	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	1.0	10.8	0.0	11.8	0.0	8.9	28.2	42.1
1999	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
1999	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
1999	Atka mackerel	Pot	ALL	0	0	0	0	0	0	0	0	0	1.0	12.7	0.0	13.7	0.0	8.3	29.1	42.1
1999	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
1999	Atka mackerel	Longline	2	0	0	0	0	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0	0.0	22.6	22.6
1999	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
1999	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
1999	Atka mackerel	Longline	ALL	0	0	0	0	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0	0.0	14.4	14.4
1999	Atka mackerel	ALL	ALL	74	11	4	89	0	7	85	89	3,878	1.9	0.3	0.1	2.3	0.0	0.2	2.2	2.3
1999	ALL	ALL	ALL	2,195	23,865	62,394	88,455	38,862	12,563	84,659	108,661	168,023	1.3	14.2	37.1	52.6	23.1	7.5	50.4	64.7
2000	Pollock	Trawl	1	205	9,666	23,010	32,881	22,021	8,692	32,630	37,168	37,764	0.5	25.6	60.9	87.1	58.3	23.0	86.4	98.4
2000	Pollock	Trawl	2	0	135	411	546	1	55	514	545	2,407	0.0	5.6	17.1	22.7	0.0	2.3	21.3	22.6
2000	Pollock	Trawl	3	2	460	219	680	0	469	670	680	11,224	0.0	4.1	1.9	6.1	0.0	4.2	6.0	6.1
2000	Pollock	Trawl	4	0	1	535	536	0	0	1	536	14,246	0.0	0.0	3.8	3.8	0.0	0.0	0.0	3.8
2000	Pollock	Trawl	ALL	207	10,262	24,175	34,643	22,022	9,217	33,815	38,929	65,642	0.3	15.6	36.8	52.8	33.5	14.0	51.5	59.3
2000	Pollock	Pot	1	0	5	11	15	2	5	15	16	20	0.6	23.5	53.7	77.9	11.6	25.0	75.8	80.9
2000	Pollock	Pot	2	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	95.0	0.0	0.0	95.0
2000	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
2000	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
2000	Pollock	Pot	ALL	0	5	11	15	2	5	15	16	20	0.6	23.5	53.6	77.8	11.7	25.0	75.7	80.9
2000	Pollock	Longline	1	0	270	5	275	162	105	274	275	283	0.0	95.4	1.8	97.2	57.2	37.1	96.8	97.2
2000	Pollock	Longline	2	0	0	4	4	0	0	4	4	5	0.0	0.0	89.1	89.1	0.0	0.0	89.1	89.2
2000	Pollock	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
2000	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
2000	Pollock	Longline	ALL	0	270	9	280	162	105	279	280	288	0.0	93.8	3.3	97.1	56.2	36.4	96.6	97.1
2000	Pollock	ALL	ALL	207	10,537	24,195	34,939	22,186	9,327	34,109	39,225	65,950	0.3	16.0	36.7	53.0	33.6	14.1	51.7	59.5
2000	P. Cod	Trawl	1	60	6,729	4,802	11,591	299	5,576	140	11,621	17,028	0.4	39.5	28.2	68.1	1.8	32.7	0.8	68.2
2000	P. Cod	Trawl	2	0	492	613	1,105	12	272	960	1,116	2,274	0.0	21.6	26.9	48.6	0.5	12.0	42.2	49.1
2000	P. Cod	Trawl	3	0	397	395	792	27	113	745	814	3,244	0.0	12.2	12.2	24.4	0.8	3.5	23.0	25.1
2000	P. Cod	Trawl	4	0	30	70	100	0	0	30	100	784	0.0	3.9	8.9	12.8	0.0	0.0	3.9	12.8
2000	P. Cod	Trawl	ALL	60	7,648	5,880	13,588	337	5,960	1,875	13,651	23,330	0.3	32.8	25.2	58.2	1.4	25.5	8.0	58.5
2000	P. Cod	Pot	1	17	4,513	3,340	7,870	1,156	0	7,216	8,310	14,626	0.1	30.9	22.8	53.8	7.9	0.0	49.3	56.8
2000	P. Cod	Pot	2	0	34	197	231	139	0	195	370	412	0.0	8.3	47.8	56.1	33.8	0.0	47.3	89.9
2000	P. Cod	Pot	3	0	0	0	0	2	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	P. Cod	Pot	4	0	0	16	16	0	0	16	19	163	0.0	0.0	10.1	10.1	0.0	0.0	10.1	11.4
2000	P. Cod	Pot	ALL	17	4,547	3,553	8,117	1,297	0	7,427	8,698	15,201	0.1	29.9	23.4	53.4	8.5	0.0	48.9	57.2
2000	P. Cod	Longline	1	0	5,610	1,729	7,339	1,213	0	7,105	7,339	8,792	0.0	63.8	19.7	83.5	13.8	0.0	80.8	83.5

				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
2000	P. Cod	Longline	2	41	61	141	243	0	0	244	244	557	7.4	10.9	25.4	43.7	0.0	0.0	43.7	43.7
2000	P. Cod	Longline	3	1	1	0	2	0	0	2	2	85	1.4	0.7	0.1	2.2	0.0	0.0	2.0	2.0
2000	P. Cod	Longline	4	0	0	2	2	0	0	2	2	126	0.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
2000	P. Cod	Longline	ALL	42	5,672	1,872	7,587	1,213	0	7,353	7,587	9,561	0.4	59.3	19.6	79.4	12.7	0.0	76.9	79.4
2000	P. Cod	ALL	ALL	120	17,867	11,305	29,292	2,848	5,960	16,654	29,936	48,091	0.2	37.2	23.5	60.9	5.9	12.4	34.6	62.2
2000	Atka mackerel	Trawl	1	0	0	0	0	0	0	0	0	0	0.0	0.0	100.0	100.0	0.0	0.0	100.0	100.0
2000	Atka mackerel	Trawl	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	Trawl	3	0	0	0	0	0	0	0	0	167	0.0	0.0	0.3	0.3	0.0	0.2	0.2	0.3
2000	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
2000	Atka mackerel	Trawl	ALL	0	0	1	1	0	0	0	1	167	0.0	0.0	0.3	0.3	0.0	0.2	0.3	0.3
2000	Atka mackerel	Pot	1	0	0	0	0	1	0	0	1	2	0.0	0.0	4.3	4.3	52.0	0.5	4.3	56.3
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0	0	0	1	0	0	1	2	0.0	0.0	4.3	4.3	52.0	0.5	4.3	56.3
2000	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
2000	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
2000	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
2000	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
2000	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
2000	Atka mackerel	ALL	ALL	0	0	1	1	1	0	1	2	169	0.0	0.0	0.4	0.4	0.6	0.2	0.3	0.9
2000	ALL	ALL	ALL	326	28,404	35,501	64,231	25,035	15,288	50,764	69,163	114,210	0.3	24.9	31.1	56.2	21.9	13.4	44.4	60.6
2001	Pollock	Trawl	1	22	2,014	34,983	37,019	22,891	9,166	36,410	38,940	39,667	0.1	5.1	88.2	93.3	57.7	23.1	91.8	98.2
2001	Pollock	Trawl	2	0	89	189	279	1	21	263	279	382	0.0	23.3	49.6	72.9	0.2	5.6	68.7	73.0
2001	Pollock	Trawl	3	684	4,644	7,591	12,918	3,584	2,016	11,997	12,941	19,436	3.5	23.9	39.1	66.5	18.4	10.4	61.7	66.6
2001	Pollock	Trawl	4	20	2,136	2,634	4,789	478	0	4,547	4,848	12,411	0.2	17.2	21.2	38.6	3.9	0.0	36.6	39.1
2001	Pollock	Trawl	ALL	725	8,883	45,396	55,005	26,954	11,204	53,217	57,008	71,897	1.0	12.4	63.1	76.5	37.5	15.6	74.0	79.3
2001	Pollock	Pot	1	0	0	0	0	0	0	0	0	5	0.0	2.9	2.6	5.4	0.0	5.4	5.4	5.4
2001	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
2001	Pollock	Pot	3	0	0	0	0	0	0	0	1	1	0.0	0.0	52.5	52.5	59.9	17.2	52.5	100.0
2001	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
2001	Pollock	Pot	ALL	0	0	0	1	0	0	1	1	6	0.0	2.5	7.6	10.1	6.0	6.6	10.1	14.9
2001	Pollock	Longline	1	0	19	63	82	0	13	82	83	102	0.2	18.6	62.0	80.9	0.4	12.7	80.5	81.3
2001	Pollock	Longline	2	0	0	0	0	0	0	0	0	0	0.0	0.0	20.4	20.4	0.0	20.4	20.4	20.4
2001	Pollock	Longline	3	0	0	0	0	0	0	0	0	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	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
2001	Pollock	Longline	ALL	0	19	63	82	0	13	82	83	104	0.2	18.3	61.0	79.5	0.4	12.5	79.1	79.9
2001	Pollock	ALL	ALL	725	8,902	45,460	55,088	26,954	11,217	53,299	57,092	72,006	1.0	12.4	63.1	76.5	37.4	15.6	74.0	79.3
2001	P. Cod	Trawl	1	33	1,258	2,010	3,301	57	528	3,235	3,305	7,678	0.4	16.4	26.2	43.0	0.7	6.9	42.1	43.0
2001	P. Cod	Trawl	2	0	369	1,044	1,413	2	32	1,232	1,413	5,430	0.0	6.8	19.2	26.0	0.0	0.6	22.7	26.0
2001	P. Cod	Trawl	3	5	349	834	1,188	11	11	1,172	1,194	4,837	0.1	7.2	17.2	24.6	0.2	0.2	24.2	24.7
2001	P. Cod	Trawl	4	3	571	2,133	2,707	16	76	2,660	2,707	6,383	0.0	8.9	33.4	42.4	0.3	1.2	41.7	42.4
2001	P. Cod	Trawl	ALL	41	2,547	6,021	8,608	86	646	8,299	8,619	24,328	0.2	10.5	24.7	35.4	0.4	2.7	34.1	35.4
2001	P. Cod	Pot	1	0	92	577	669	0	634	669	669	1,598	0.0	5.8	36.1	41.8	0.0	39.7	41.8	41.8
2001	P. Cod	Pot	2	0	0	0	0	58	942	1,533	2,122	2,328	0.0	0.0	0.0	0.0	2.5	40.5	65.9	91.1
2001	P. Cod	Pot	3	0	9	316	326	366	61	318	520	1,078	0.0	0.8	29.4	30.2	34.0	5.7	29.5	48.2
2001	P. Cod	Pot	4	0	0	0	0	0	0	0	0	2,140	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2001	P. Cod	Pot	ALL	0	101	893	994	425	1,637	2,521	3,311	7,145	0.0	1.4	12.5	13.9	5.9	22.9	35.3	46.3
2001	P. Cod	Longline	1	17	1,308	5,374	6,698	33	551	6,130	6,730	9,665	0.2	13.5	55.6	69.3	0.3	5.7	63.4	69.6
2001	P. Cod	Longline	2	0	43	127	170	0	131	59	170	225	0.0	19.1	56.5	75.5	0.0	58.5	26.3	75.5
2001	P. Cod	Longline	3	0	2	14	16	0	14	2	16	78	0.0	2.4	18.3	20.6	0.0	18.3	2.4	20.6
2001	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

				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
2001	P. Cod	Longline	ALL	17	1,352	5,515	6,883	33	697	6,191	6,916	9,968	0.2	13.6	55.3	69.1	0.3	7.0	62.1	69.4
2001	P. Cod	ALL	ALL	57	4,000	12,429	16,486	544	2,981	17,011	18,846	41,441	0.1	9.7	30.0	39.8	1.3	7.2	41.0	45.5
2001	Atka mackerel	Trawl	1	0	1	2	3	0	1	3	3	3	4.1	19.2	62.5	85.8	0.0	23.3	85.8	85.8
2001	Atka mackerel	Trawl	2	0	0	9	9	0	1	4	9	13	0.0	0.0	73.5	73.5	0.0	7.8	33.1	73.5
2001	Atka mackerel	Trawl	3	1	0	19	20	0	11	10	20	38	2.5	0.0	49.8	52.3	0.0	28.3	26.5	52.3
2001	Atka mackerel	Trawl	4	0	0	15	15	0	0	0	15	22	0.0	0.0	68.8	68.8	0.0	1.8	0.0	68.8
2001	Atka mackerel	Trawl	ALL	1	1	45	47	0	13	17	47	76	1.4	0.8	59.7	61.9	0.0	17.0	22.3	61.9
2001	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
2001	Atka mackerel	Pot	2	0	0	0	0	0	0	0	0	0	0.0	33.0	49.2	82.2	0.0	11.0	39.0	82.2
2001	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
2001	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
2001	Atka mackerel	Pot	ALL	0	0	0	0	0	0	0	0	1	0.0	13.7	20.4	34.2	0.0	4.6	16.2	34.2
2001	Atka mackerel	Longline	1	0	0	0	0	0	0	0	0	0	0.0	5.7	24.3	30.0	0.0	0.0	22.9	30.0
2001	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
2001	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
2001	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
2001	Atka mackerel	Longline	ALL	0	0	0	0	0	0	0	0	0	0.0	5.1	21.8	26.9	0.0	0.0	20.5	26.9
2001	Atka mackerel	ALL	ALL	1	1	46	47	0	13	17	47	77	1.4	0.9	59.3	61.6	0.0	16.8	22.2	61.6
2001	ALL	ALL	ALL	784	12,903	57,935	71,622	27,498	14,211	70,327	75,985	113,524	0.7	11.4	51.0	63.1	24.2	12.5	61.9	66.9
2002	Pollock	Trawl	1	0	873	6,160	7,033	2,546	6,414	2,335	8,749	21,903	0.0	4.0	28.1	32.1	11.6	29.3	10.7	39.9
2002	Pollock	Trawl	2	0	8	209	217	45	178	6	218	287	0.0	2.7	72.8	75.5	15.5	62.1	2.0	75.7
2002	Pollock	Trawl	3	0	3,717	7,922	11,639	514	11,621	2,880	11,641	17,590	0.0	21.1	45.0	66.2	2.9	66.1	16.4	66.2
2002	Pollock	Trawl	4	0	1,347	5,343	6,691	0	6,613	4,053	7,826	11,980	0.0	11.2	44.6	55.8	0.0	55.2	33.8	65.3
2002	Pollock	Trawl	ALL	0	5,945	19,635	25,580	3,105	24,827	9,274	28,434	51,761	0.0	11.5	37.9	49.4	6.0	48.0	17.9	54.9
2002	Pollock	Pot	1	0	0	0	0	0	0	0	0.24126	1	0.0	2.9	22.1	25.0	0.0	25.0	2.8	27.8
2002	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
2002	Pollock	Pot	3	0	4	5	9	9	9	0	9.21852	9	0.0	43.2	56.7	99.9	99.6	99.9	0.0	99.9
2002	Pollock	Pot	4	0	5	0	5	5	5	0	5.41908	5	0.0	99.9	0.1	100.0	99.9	100.0	0.0	100.0
2002	Pollock	Pot	ALL	0	9	5	15	15	15	0	14.87886	16	0.0	60.7	35.0	95.8	94.2	95.7	0.2	95.9
2002	Pollock	Longline	1	0	0	27	28	6	24	2	29.51932	84	0.0	0.5	32.3	32.9	6.7	29.0	2.1	35.0
2002	Pollock	Longline	2	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
2002	Pollock	Longline	3	0	0	0	0	0	0	0	0.14616	3	0.0	0.0	4.2	4.2	0.0	4.2	0.0	4.2
2002	Pollock	Longline	4	0	0	1	1	0	0	0	0.90234	2	0.0	6.3	29.9	36.2	0.0	11.6	0.0	36.2
2002	Pollock	Longline	ALL	0	1	28	29	6	25	2	30.56782	96	0.0	0.6	29.2	29.9	5.8	25.8	1.8	31.7
2002	Pollock	ALL	ALL	0	5,955	19,668	25,624	3,125	24,866	9,276	28,479	51,873	0.0	11.5	37.9	49.4	6.0	47.9	17.9	54.9
2002	P. Cod	Trawl	1	4	1,517	2,828	4,349	856	4,344	64	4,411	11,406	0.0	13.3	24.8	38.1	7.5	38.1	0.6	38.7
2002	P. Cod	Trawl	2	0	75	663	738	356	532	206	873	3,554	0.0	2.1	18.7	20.8	10.0	15.0	5.8	24.6
2002	P. Cod	Trawl	3	0	319	812	1,130	286	977	83	1,175	3,700	0.0	8.6	21.9	30.5	7.7	26.4	2.2	31.8
2002	P. Cod	Trawl	4	0	239	472	711	3	670	123	728	1,271	0.0	18.8	37.1	55.9	0.3	52.8	9.7	57.3
2002	P. Cod	Trawl	ALL	4	2,150	4,775	6,928	1,502	6,523	476	7,188	19,930	0.0	10.8	24.0	34.8	7.5	32.7	2.4	36.1
2002	P. Cod	Pot	1	0	584	1,006	1,590	146	1,519	601	2,108	3,399	0.0	17.2	29.6	46.8	4.3	44.7	17.7	62.0
2002	P. Cod	Pot	2	0	1	77	78	75	56	0	78	84	0.0	0.9	91.6	92.5	89.6	66.3	0.0	92.5
2002	P. Cod	Pot	3	10	95	1,369	1,475	1,099	380	0	1,475	2,421	0.4	3.9	56.6	60.9	45.4	15.7	0.0	60.9
2002	P. Cod	Pot	4	0	453	731	1,185	361	896	0	1,185	1,767	0.0	25.7	41.4	67.1	20.4	50.7	0.0	67.1
2002	P. Cod	Pot	ALL	10	1,134	3,184	4,328	1,680	2,851	601	4,845	7,671	0.1	14.8	41.5	56.4	21.9	37.2	7.8	63.2
2002	P. Cod	Longline	1	0	554	3,178	3,732	475	3,208	783	4,435	11,038	0.0	5.0	28.8	33.8	4.3	29.1	7.1	40.2
2002	P. Cod	Longline	2	0	48	5	53	47	51	30	83	201	0.1	23.8	2.5	26.4	23.3	25.4	15.0	41.5
2002	P. Cod	Longline	3	0	0	26	26	0	26	0	26	294	0.0	0.0	8.8	8.8	0.0	8.8	0.0	8.8
2002	P. Cod	Longline	4	2	740	692	1,434	304	1,041	71	1,505	3,171	0.1	23.3	21.8	45.2	9.6	32.8	2.2	47.5
2002	P. Cod	Longline	ALL	2	1,342	3,901	5,245	826	4,326	884	6,049	14,705	0.0	9.1	26.5	35.7	5.6	29.4	6.0	41.1
2002	P. Cod	ALL	ALL	16	4,625	11,860	16,501	4,009	13,700	1,960	18,082	42,306	0.0	10.9	28.0	39.0	9.5	32.4	4.6	42.7
2002	Atka mackerel	Trawl	1	0	1	0	1	0	1	0	1	4	0.0	27.9	4.0	31.9	7.3	31.9	0.0	31.9

				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
2002	Atka mackerel	Trawl	2	0	0	0	0	0	0	0	0	4	0.0	0.0	10.8	10.8	4.1	3.6	0.0	10.8
2002	Atka mackerel	Trawl	3	0	0	6	6	1	5	0	6	72	0.0	0.0	8.2	8.2	0.8	7.5	0.0	8.2
2002	Atka mackerel	Trawl	4	0	0	1	1	0	1	0	1	2	0.0	0.0	59.6	59.6	0.0	56.1	0.0	59.6
2002	Atka mackerel	Trawl	ALL	0	1	8	9	1	8	0	9	83	0.0	1.2	9.4	10.6	1.2	9.6	0.0	10.6
2002	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
2002	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
2002	Atka mackerel	Pot	3	0	0	0	0	0	0	0	0	0	0.0	0.0	100.0	100.0	100.0	0.0	0.0	100.0
2002	Atka mackerel	Pot	4	0	0	0	0	0	0	0	0	1	0.0	4.7	5.2	9.9	6.6	7.2	0.0	9.9
2002	Atka mackerel	Pot	ALL	0	0	0	0	0	0	0	0	1	0.0	4.3	14.3	18.6	15.6	6.5	0.0	18.6
2002	Atka mackerel	Longline	1	0	0	1	1	1	0	0	1	1	0.0	0.0	96.8	96.8	76.3	20.5	0.0	96.8
2002	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
2002	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
2002	Atka mackerel	Longline	4	0	0	0	0	0	0	0	0	0	0.0	0.0	96.3	96.3	22.9	73.5	0.0	96.3
2002	Atka mackerel	Longline	ALL	0	0	1	1	1	0	0	1	1	0.0	0.0	91.5	91.5	67.4	24.1	0.0	91.5
2002	Atka mackerel	ALL	ALL	0	1	9	10	2	8	0	10	85	0.0	1.3	10.6	11.9	2.4	9.7	0.0	11.9
2002	ALL	ALL	ALL	16	10,582	31,537	42,135	7,136	38,575	11,236	46,572	94,264	0.0	11.2	33.5	44.7	7.6	40.9	11.9	49.4

Appendix III

This is a comparison of "traditional" fishing areas in 1991,1998, and 1999 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, and 1999 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			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	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	-	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	655	221	92	1,419	1,605	2,498	1,919	1,488	1,132	3,993	3,315	3,722	680	0	53	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	1,648	130	190	7,485	2,997	1,812	18,092	4,702	381	27,225	7,829	2,383	0	150	102	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	161	275	8	46	60	102	693	651	686	900	986	796	1,463	900	1,527	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	128	200	110	10	45	95	57	110	229	195	355	434	223	381	605	106	43	38	124	69	167	228	385	605	228	385	617	3,336	12,846	12,399	7	3	5
EBS	Trawl	81	0	47	6,298	0	1,219	1,716	0	20	8,095	0	1,286	8,649	0	1,286	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	114	475	161	333	4,572	3,330	116	334	901	563	5,381	4,392	139	1,041	1,287	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	240	0	197	355	312	896	0	8	5	595	320	1,098	0	38	46	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	39	286	131	708	708	-	140	219	147	887	1,213	277	782	849	147	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		3,195	1,603	950	16,660	10,389	11,266	22,733	8,624	3,531	42,588	20,616	15,746	11,944	3,359	5,053	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			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	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	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	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	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	0	0	23	3,275	84	125	48,225	11	14	51,500	95	162	1,398	80	-	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		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	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			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	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	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	272	65	280	18,030	342	568	902	7,828	8,656	19,204	8,235	9,505	13,165	188	6	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		272	65	280	18,948	444	568	2,120	8,282	10,600	21,340	8,791	11,449	15,301	780	1,950	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, 1998, and 1999 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 - Methods for Tables III-7(a-f)

Estimates of catch and biomass of three groundfish species in Steller sea lion critical habitat were tabulated in order to compare the distributions and harvest rates (by area) of the 1999 and 2002 fisheries (Tables III-7(a-f)). The goal was to compare local area harvest rates, catch divided by biomass, of the 1999 and 2002 fisheries for Atka mackerel, pollock and Pacific cod in the GOA, EBS and AI. Four areas were chosen for analysis:

- 0-10 nm from listed rookery or haulout
- 10-20 nm from a listed rookery or haulout
- Outside of 20 nm from a listed rookery or haulout but inside a critical habitat foraging area, and
- Outside of critical habitat

Catch estimates by area were obtained for 1999 and 2002 through queries of the observer database (see Appendix 2).

NMFS does not undertake surveys of groundfish on the spatial or temporal scale necessary to compute biomass estimates by season and the four areas listed above. However, NMFS had previously undertaken an exercise to estimate, using all relevant commercial, survey, and life history data available, the relative proportion of the biomass of pollock and Atka mackerel cod inside critical habitat in the GOA, AI and EBS by month (NMFS 2000). These proportions were updated for EBS pollock, but NMFS (2000) estimates were utilized for GOA pollock and AI mackerel for the present analysis. For BSAI and GOA Pacific cod, the absolute biomass estimates within critical habitat by month in NMFS (2000) were converted to proportions using the 1999 GOA and average 1998-2000 BSAI stock assessment biomass estimates (G. Thompson, personal communication).

Proportions of Biomass by Month for Each Species Inside Critical Habitat by Region

Month	GOA Pollock	AI Atka mackerel	EBS Pollock	GOA Pacific cod	BSAI Pacific cod
Jan	84%	67%	48%	88%	75%
Feb	85%	67%	52%	91%	78%
Mar	85%	67%	55%	81%	68%
Apr	82%	67%	56%	57%	43%
May	77%	67%	36%	33%	19%
Jun	76%	67%	15%	24%	9%
Jul	77%	67%	16%	26%	11%
Aug	78%	67%	19%	33%	19%
Sep	79%	67%	24%	44%	30%
Oct	81%	67%	29%	57%	43%
Nov	82%	67%	36%	70%	57%
Dec	83%	67%	42%	81%	68%

To estimate the biomass in portions of critical habitat, an assumption was made that each species was evenly distributed within critical habitat < 1000 m in depth. Therefore, the proportion of biomass by month within each subarea would be proportional to the surface area in each subarea:

Percentage and Area (km^2) of Critical Habitat by Region < 1000 m Depth

	GOA		AI		EBS	
Part of CH	**%**	**Area**	**%**	**Area**	**%**	**Area**
0-10 nm	37%	54,990	46%	30,999	19%	15,374
10-20 nm	54%	79,882	52%	34,949	37%	30,981
Foraging*	9%	12,749	1%	846	44%	36,554
Total		147,621		66,795		82,909

*Foraging=critical habitat foraging areas, but not within 20 nm of a listed rookery or haulout

Catches by area were estimated for two time periods in 1999 and 2002: January-June, and July-December. The begin-year biomass estimates for 1999 and 2002 were utilized to estimate the biomass available each year by area. Estimates for 1999 were those calculated in fall 1998 that were utilized to set the ABC in 1999; similarly for 2002, fall 2001 estimates were used. The following calculations were made:

- Jan-Jun Biomass by area = Begin year biomass * Jan-Jun (average) proportion by area
- Jan-Jun Harvest rate by area = Jan-Jun Catch by area/Jan-Jun Biomass by area
- Jul-Dec Biomass by area = Begin year biomass * Jul-Dec (average) proportion by area minus Jan-Jun catch by area
- Jul-Dec Harvest rate by area = Jul-Dec Catch by area/Jul-Dec Biomass by area
- Annual Biomass by area = Begin year biomass * Jan-Dec (average) proportion by area
- Annual Harvest rate by area = Jan-Dec Catch by area/Annual Biomass by area

The following assumptions were made in this analysis:

- Recruitment+individual growth=natural mortality between Jan-Jun and Jul-Dec
- Fish are evenly distributed within critical habitat

Appendix V - Density maps of catch distribution between the 1999 and 2002 fisheries.

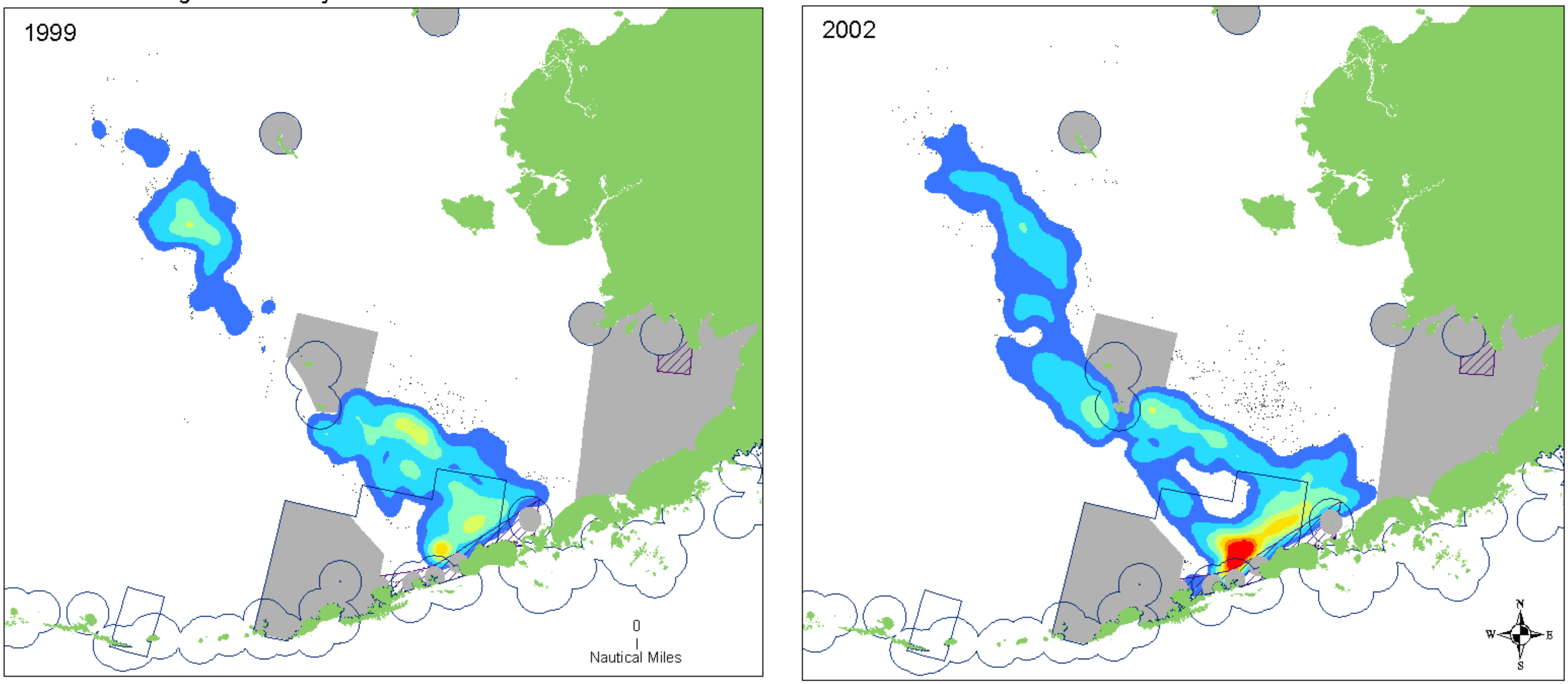
Appendix V consists of a series of maps which depict the distribution of catch in fisheries targeting pollock, Pacific cod, and Atka mackerel in the eastern Bering Sea (EBS), Aleutian Islands (AI), and Gulf of Alaska (GOA). Side-by-side comparisons of 1999 and 2002 catch distributions show the change in the concentration of fishing removals under their respective fishery management regimes. Catch distributions were plotted over the 2002 Steller sea lion Protection Measure closure areas and Steller sea lion critical habitat boundaries to show 1999 catch that was displaced by the current protection measures and the change in fishery removals inside Steller sea lion critical habitat. Catch distributions are represented as contoured density surfaces (metric tons of catch per km^2) to show the relative concentration of removals from each fishery and the difference in these removals between 1999 and 2002.

The source of the catch data was the groundfish fishery observer database. Observed catches are associated with a haul retrieval latitude and longitude which served as the spatial reference of the catch distributions. Total observed catch was extrapolated up to the total reported catch for each fishery (source, NOAA Fisheries Alaska Region 'Blend' catch accounting system). Total reported catch was divided by total observed catch to obtain an expansion factor for each fishery. Catch from each observed haul was multiplied by the appropriate expansion factor to proportionally allocate unobserved catch to the observed fishing distribution based on the assumption that the observed fishing distribution reflected the unobserved fishing distribution.

Catch density surfaces were generated in ArcGIS using the Spatial Analyst extension. The expanded catch was summed over a specified radius and divided by the area contained by that radius. Results were reported as catch (mT) / km^2 at the resolution of 5 km^2 grid cells (the resolution of EBS pollock catch is 4 km^2 grid cells). Catch densities were classified into bins using natural breaks (Jenks). Manual adjustments were made to the bins resulting from the natural breaks to standardize the bins (and thus the legend) between 1999 and 2002 to facilitate visual comparisons. Overall resulting patterns in catch density were reliant on the distribution of catch from individual hauls. Therefore, tables are provided on each map to show the minimum, maximum, and mean catch per haul in 1999 and 2002. The total catch from each fishery in 1999 and 2002 is provided to show the difference in the magnitude of catch between the two years.

The location of observed hauls with less catch than the smallest value represented in the legend are depicted as points. In some instances on the 2002 fishery maps, catch density surfaces overlap the edge of closure areas. This overlap is a result of the resolution at which the density surfaces were calculated and the resolution at which the results were displayed.

Appendix V. Figure 1. Distribution of observed EBS Pollock trawl catch in 1999 and 2002 and EBS Pollock trawl closures in effect in 2002. Density surfaces of Pollock catch (mT/ 4 km^2) were generated from observer haul data that were expanded up to the annual 'Blend' total. Pollock catch density was classified into seven categories using natural breaks (Jenks). Categories generated from natural breaks were manually adjusted to standardize the legend between years.



Legend

SSL Critical Habitat
Year Round Trawl Closure
Seasonal Trawl Closure
Observed Pollock Trawl Haul

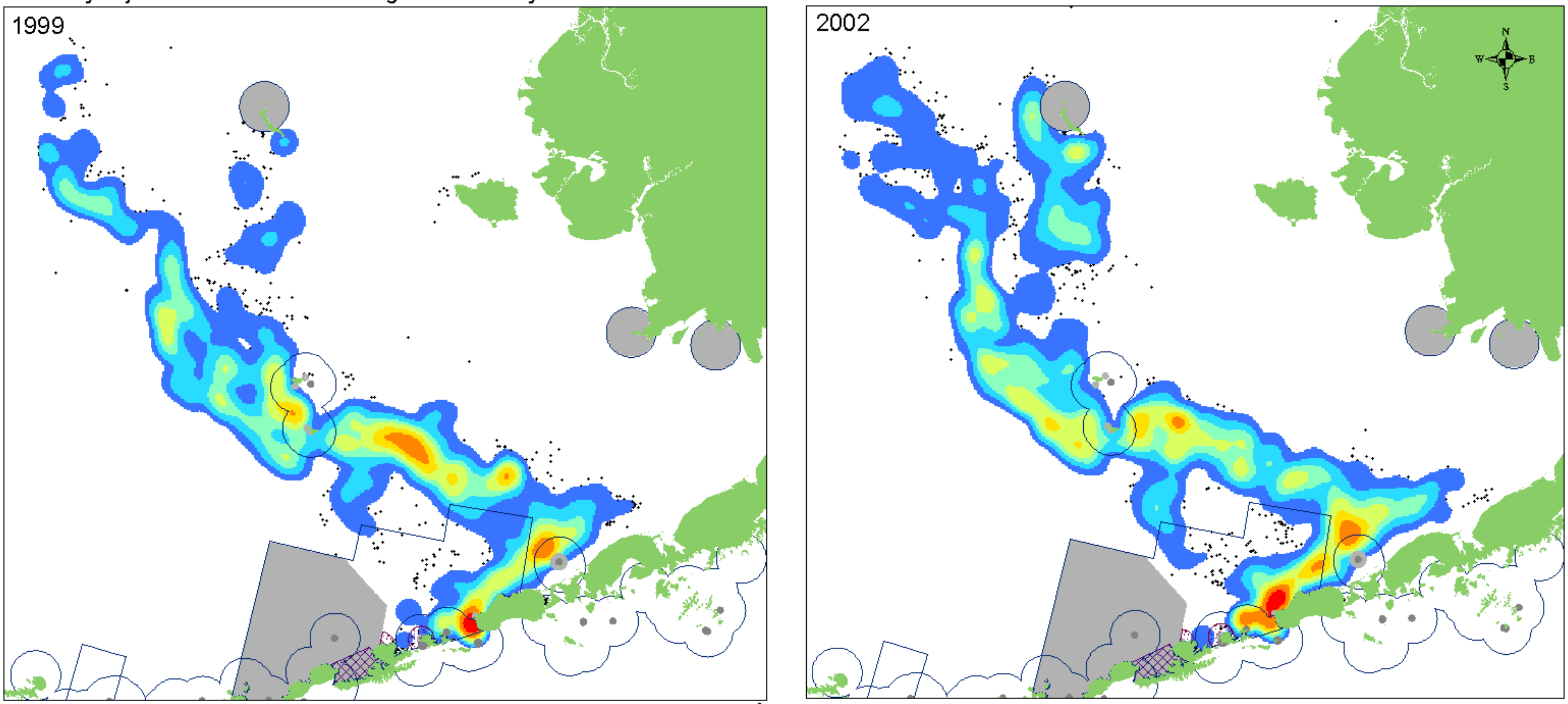
Catch (mT) / 4 km^2

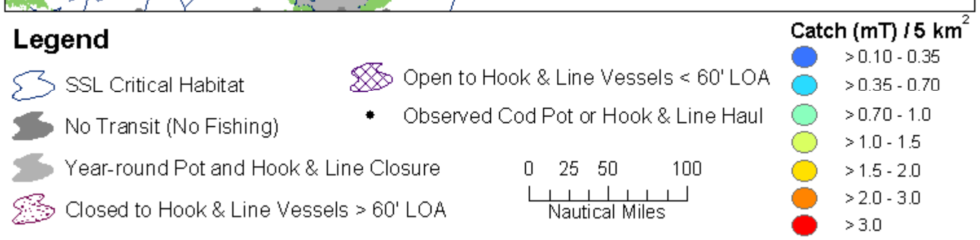
> 1 - 5
> 5 - 15
> 15 - 30
> 30 - 45
> 45 - 60
> 60 - 75
> 75

* **Cell size = 4 km^2**

Catch per Haul (mT)		
	1999	2002
Min	0.00	0.01
Mean	85	93
Max	519	467
Total	965,931	1,460,271

Appendix V. Figure 2. Distribution of observed EBS Pacific cod pot and hook & line catch in 1999 and 2002 and EBS Pacific cod fixed gear closures in effect in 2002. Density surfaces of Pacific cod catch (mT/ 5 sq. km) were generated from observer haul data that were expanded up to the annual 'Blend' total. Pacific cod catch density was classified into seven categories using natural breaks (Jenks). Categories generated from natural breaks were manually adjusted to standardize the legend between years.

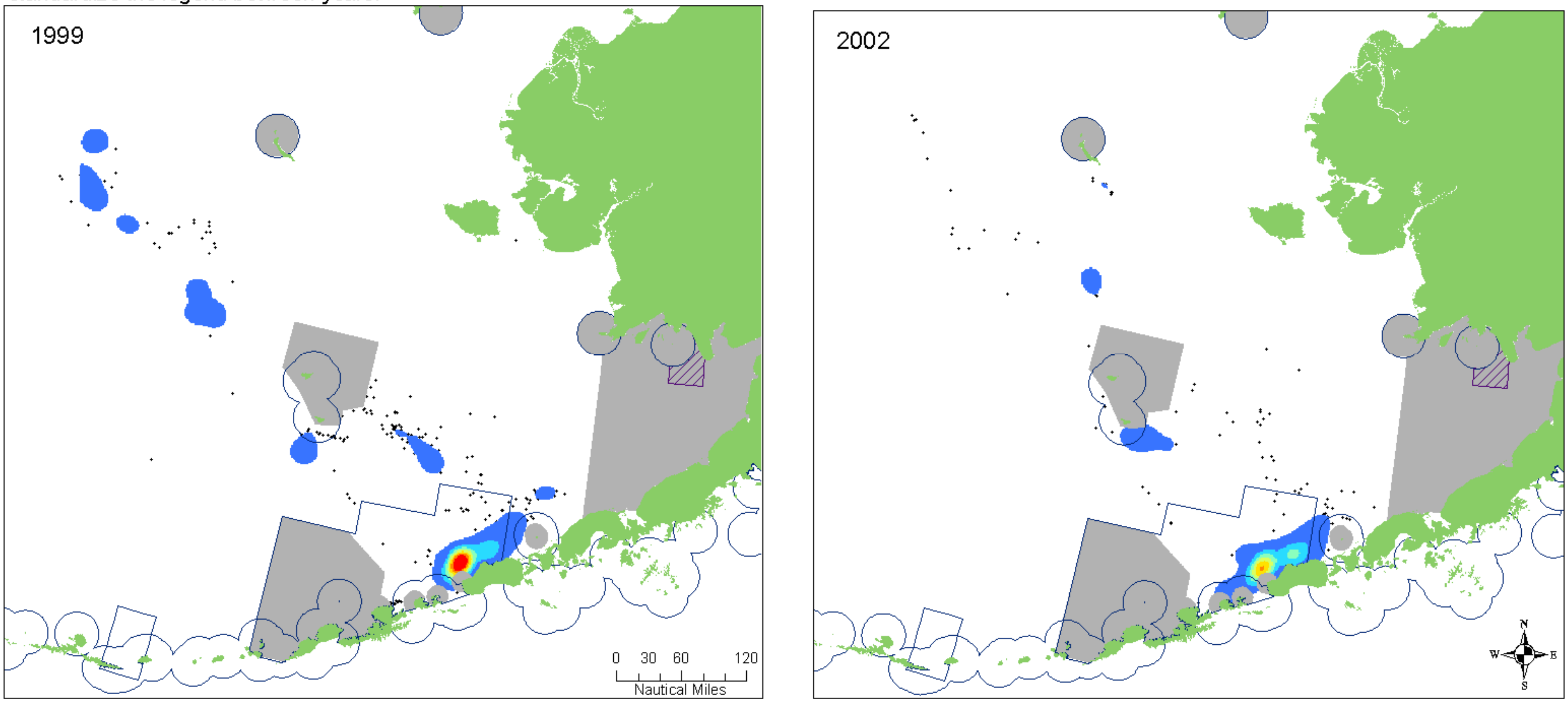




Catch per Haul (mT)

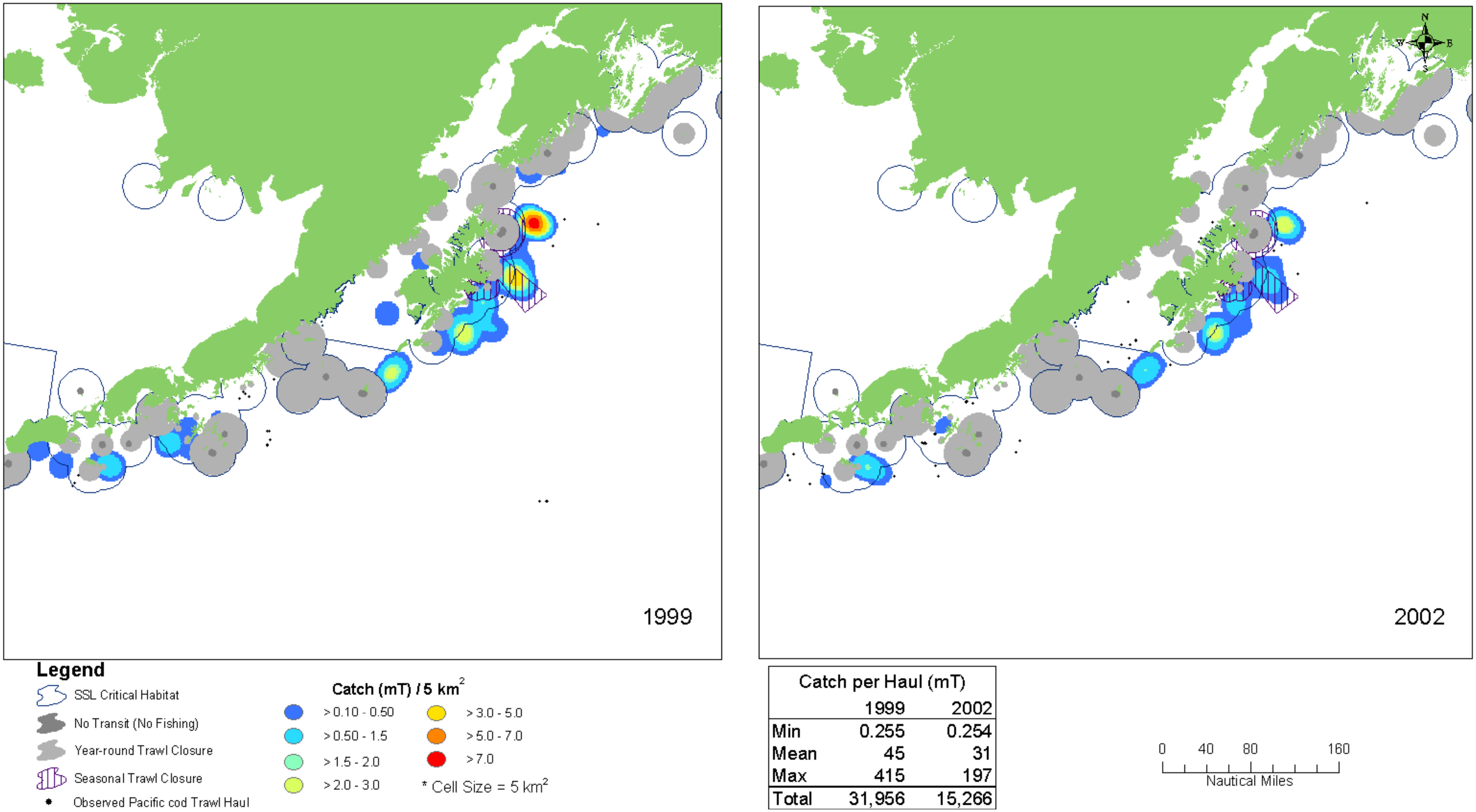
	1999	2002
Min	0.001	0.008
Mean	11.6	11.2
Max	97.3	152.0
Total	93,794	114,517

Appendix V. Figure 3. Distribution of observed EBS Pacific cod trawl catch in 1999 and 2002 and EBS Pacific cod trawl closures in effect in 2002. Density surfaces of Pacific cod catch (mT/ 5 km^2) were generated from observer haul data that were expanded up to the annual 'Blend' total. Pacific cod catch density was classified into seven categories using natural breaks (Jenks). Categories generated from natural breaks were manually adjusted to standardize the legend between years.



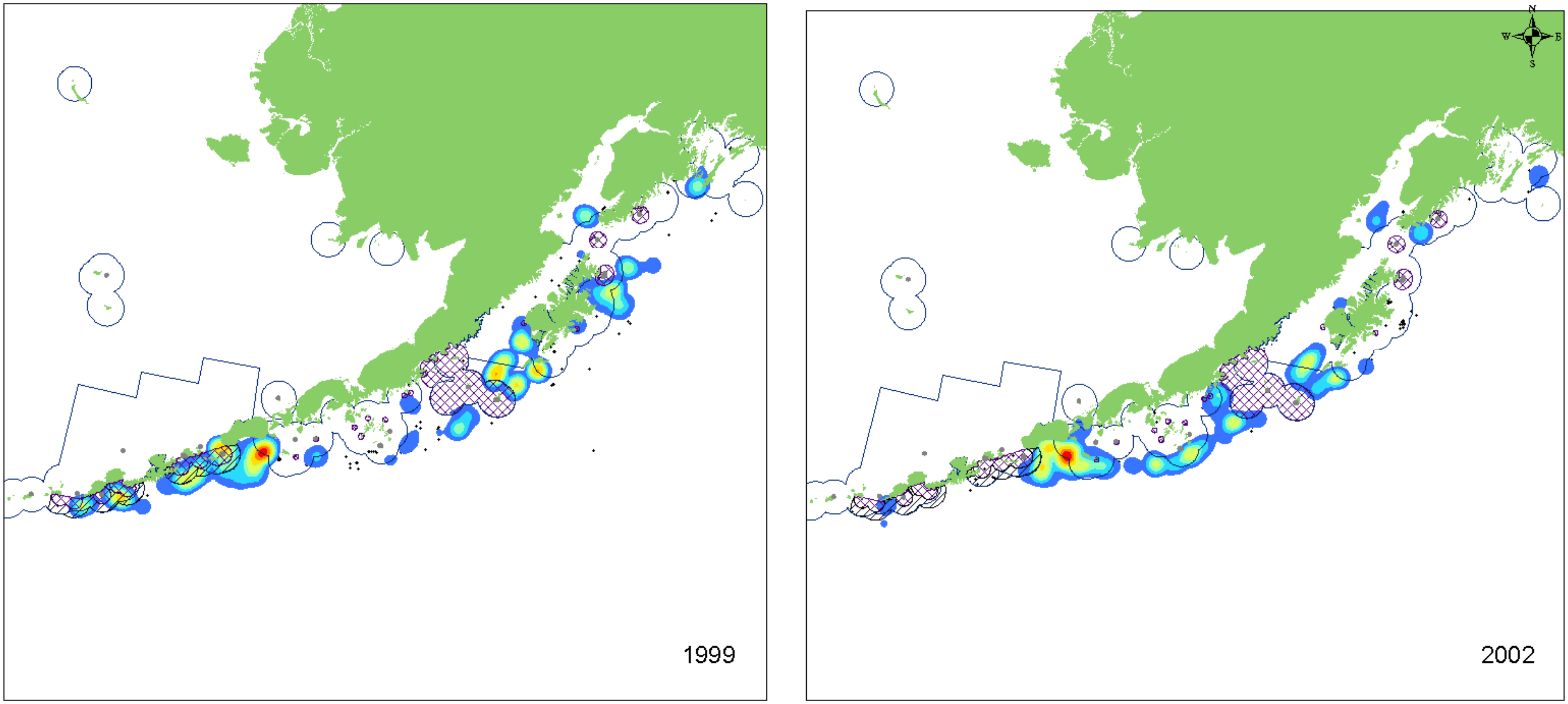
Catch per Haul (mT)		
	1999	2002
Min	0.02	0.12
Mean	15	13
Max	148	109
Total	**28,758**	**22,077**

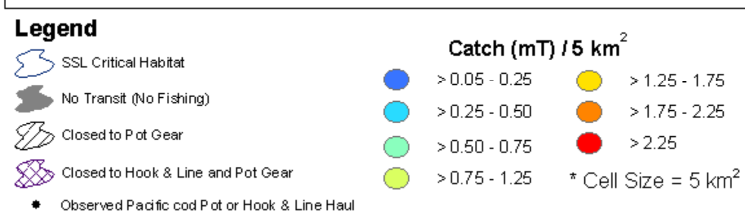
Appendix V. Figure 4. Distribution of observed GOA Pacific cod trawl catch in 1999 and 2002 and GOA Pacific cod trawl closures in effect in 2002. Density surfaces of Pacific cod catch (mT/ 5 km^2) were generated from observer haul data that were expanded up to the annual 'Blend' total. Pacific cod catch density was classified into seven categories using natural breaks (Jenks). Categories generated from natural breaks were manually adjusted to standardize the legend between years.



Catch per Haul (mT)		
	1999	2002
Min	0.255	0.254
Mean	45	31
Max	415	197
Total	31,956	15,266

Appendix V. Figure 5. Distribution of observed GOA Pacific cod pot and hook & line catch in 1999 and 2002 and GOA Pacific cod fixed gear closures in effect in 2002. Density surfaces of Pacific cod catch (mT/ 5 sq km) were generated from observer haul data that were expanded up to the annual 'Blend' total. Pacific cod catch density was classified into seven categories using natural breaks (Jenks). Categories generated from natural breaks were manually adjusted to standardize the legend between years.

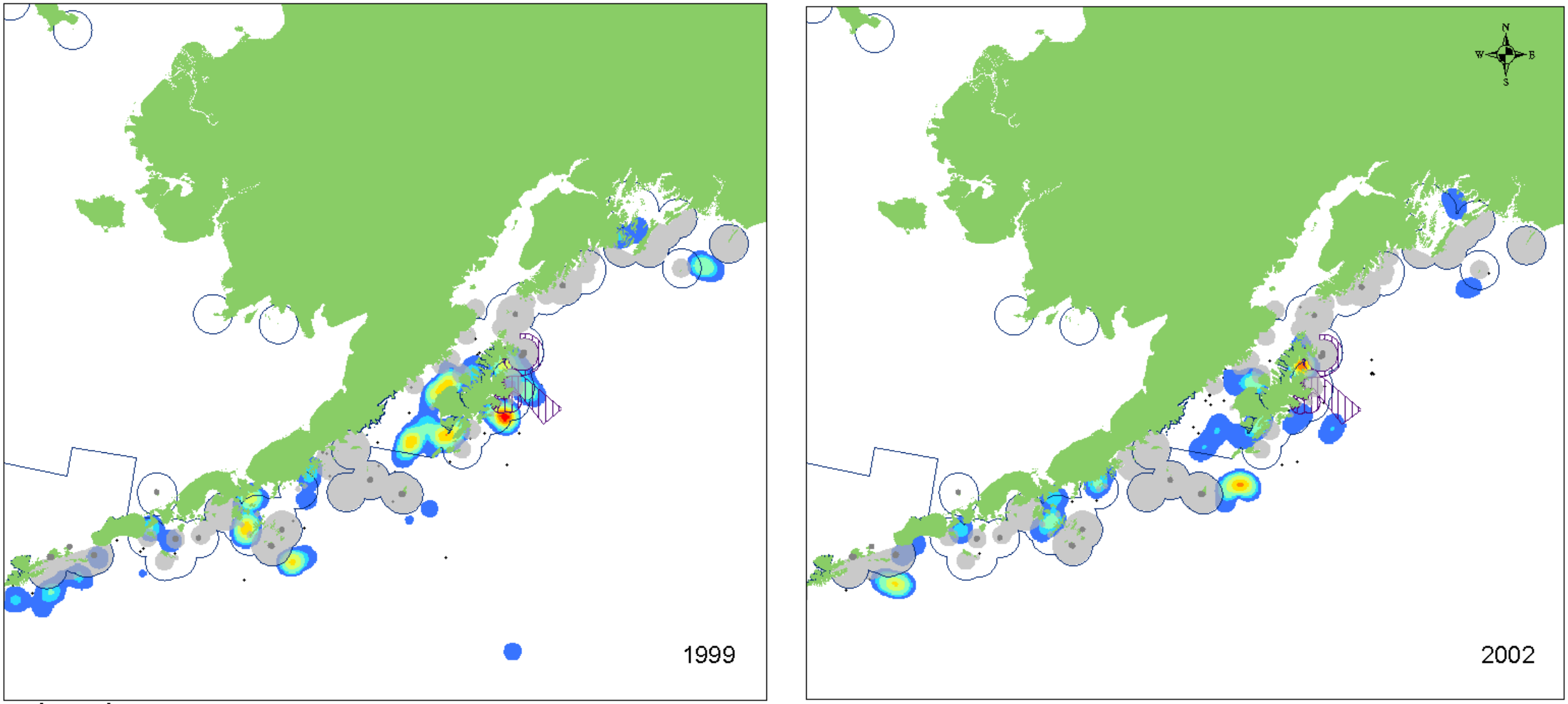


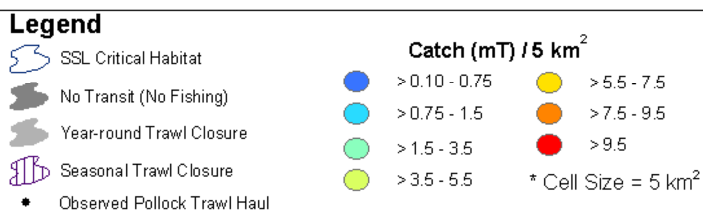


Catch per Haul (mT)

	1999	2002
Min	0.021	0.020
Mean	33	28
Max	346	255
Total	31,289	22,075

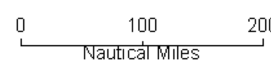
Appendix V. Figure 6. Distribution of observed GOA trawl pollock catch in 1999 and 2002 and GOA pollock trawl closures in effect in 2002. Density surfaces of pollock catch (mT/ 5 km^2) were generated from observer haul data that were expanded up to the annual 'Blend' total. Pollock catch density was classified into seven categories using natural breaks (Jenks). Categories generated from natural breaks were manually adjusted to standardize the legend between years.



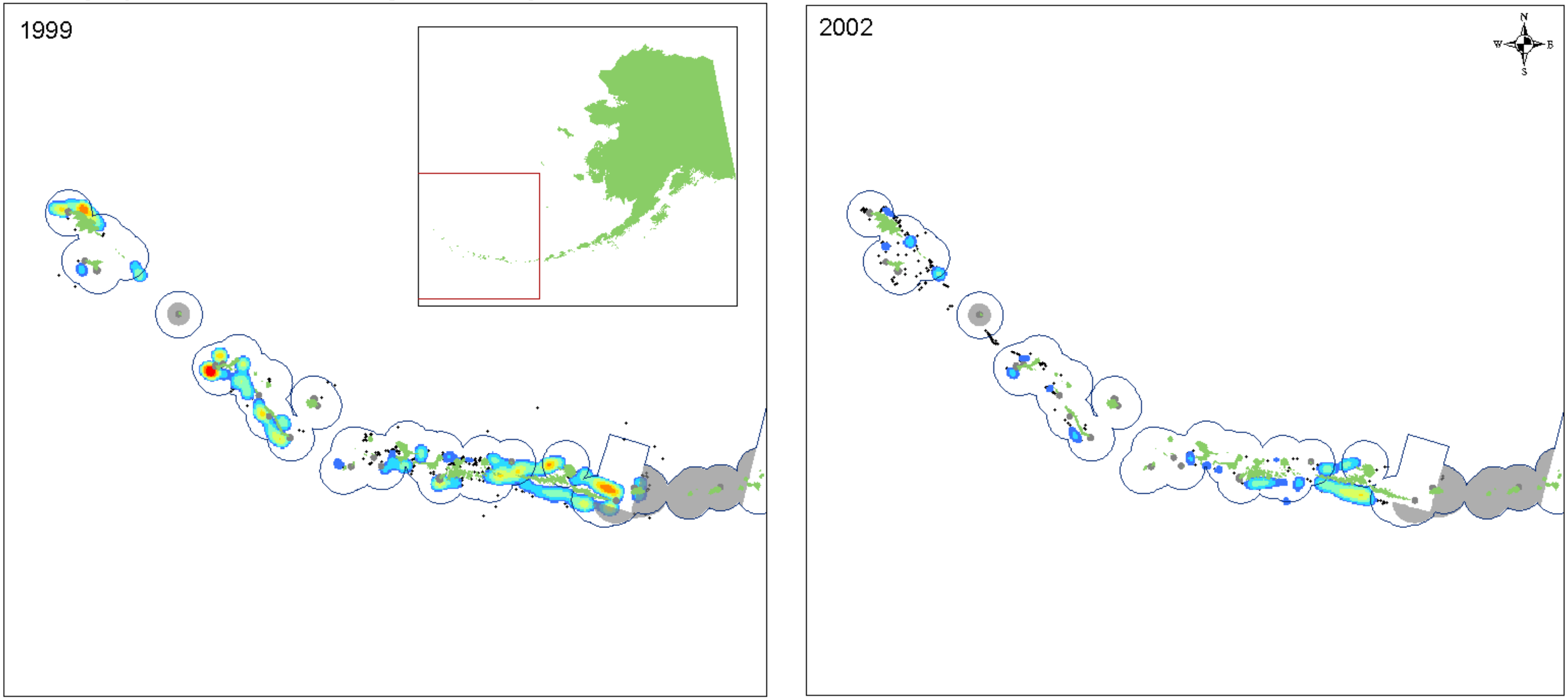


Catch per Haul (mT)

	1999	2002
Min	0.004	0.018
Mean	107	92
Max	500	542
Total	94,446	50,823



Appendix V. Figure 7. Distribution of observed AI Pacific cod pot and hook & line catch in 1999 and 2002 and AI Pacific cod fixed gear closures in effect in 2002. Density surfaces of Pacific cod catch (mT/ 5 sq. km) were generated from observer haul data that were expanded up to the annual 'Blend' total. Pacific cod catch density was classified into seven categories using natural breaks (Jenks). Categories generated from natural breaks were manually adjusted to standardize the legend between years.



Legend

SSL Critical Habitat

No Transit (No Fishing)

Closed to Pot and Hook & Line Gear

Observed Pot or Hook & Line Haul

Catch (mT) / 5 km^2

- > 0.08 - 0.16
- > 0.16 - 0.32
- > 0.32 - 0.65
- > 0.65 - 1.10
- > 1.10 - 1.60
- > 1.60 - 2.40
- > 2.40

* Cell Size = 5 km^2

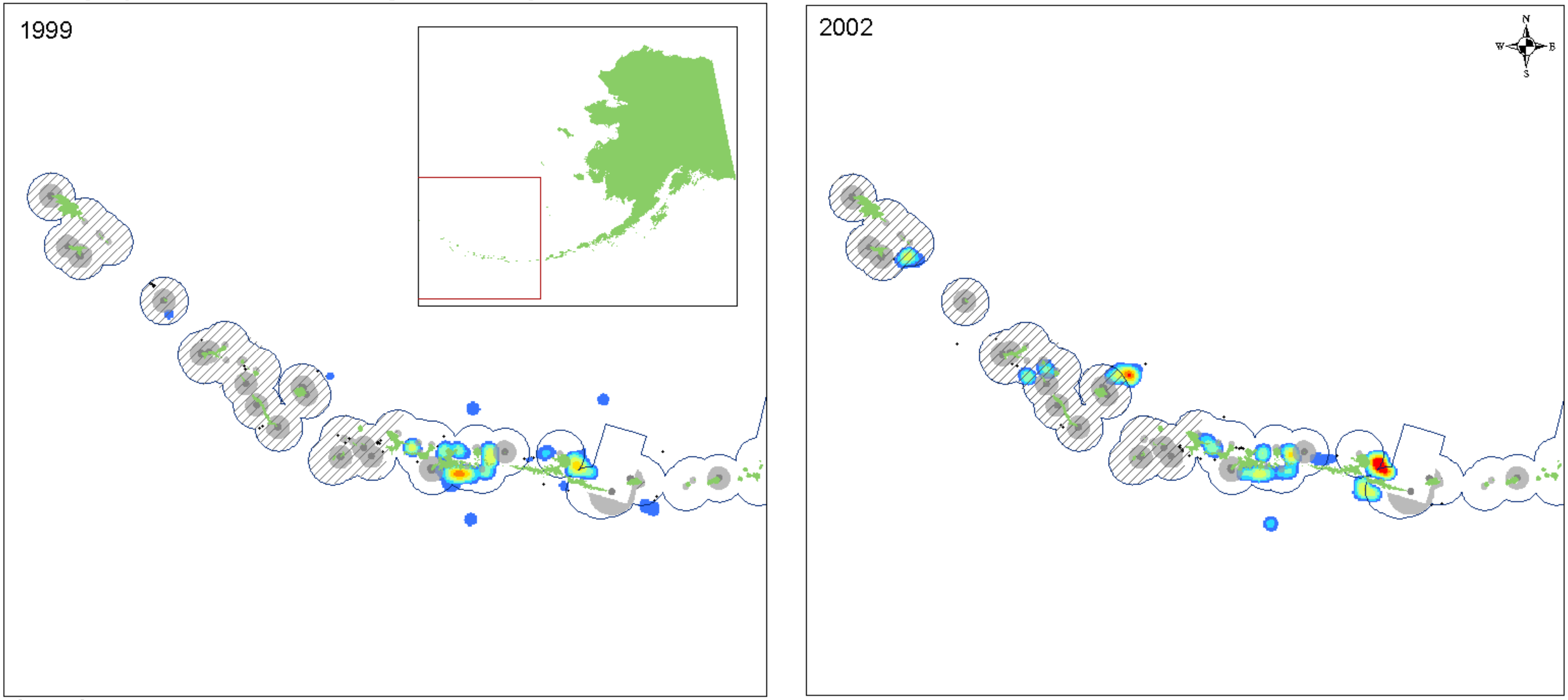
Catch per Haul (mT)

	1999	2002
Min	0.005	0.022
Mean	7.6	4.5
Max	89	37
Total	11,609	2,822

0 50 100 200

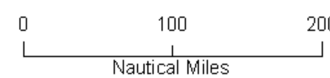
Nautical Miles

Appendix V. Figure 8. Distribution of observed AI Pacific cod trawl catch in 1999 and 2002 and AI Pacific cod trawl closures in effect in 2002. Density surfaces of Pacific cod catch (mT/ 5 km^2) were generated from observer haul data that were expanded up to the annual 'Blend' total. Pacific cod catch density was classified into seven categories using natural breaks (Jenks). Categories generated from natural breaks were manually adjusted to standardize the legend between years.

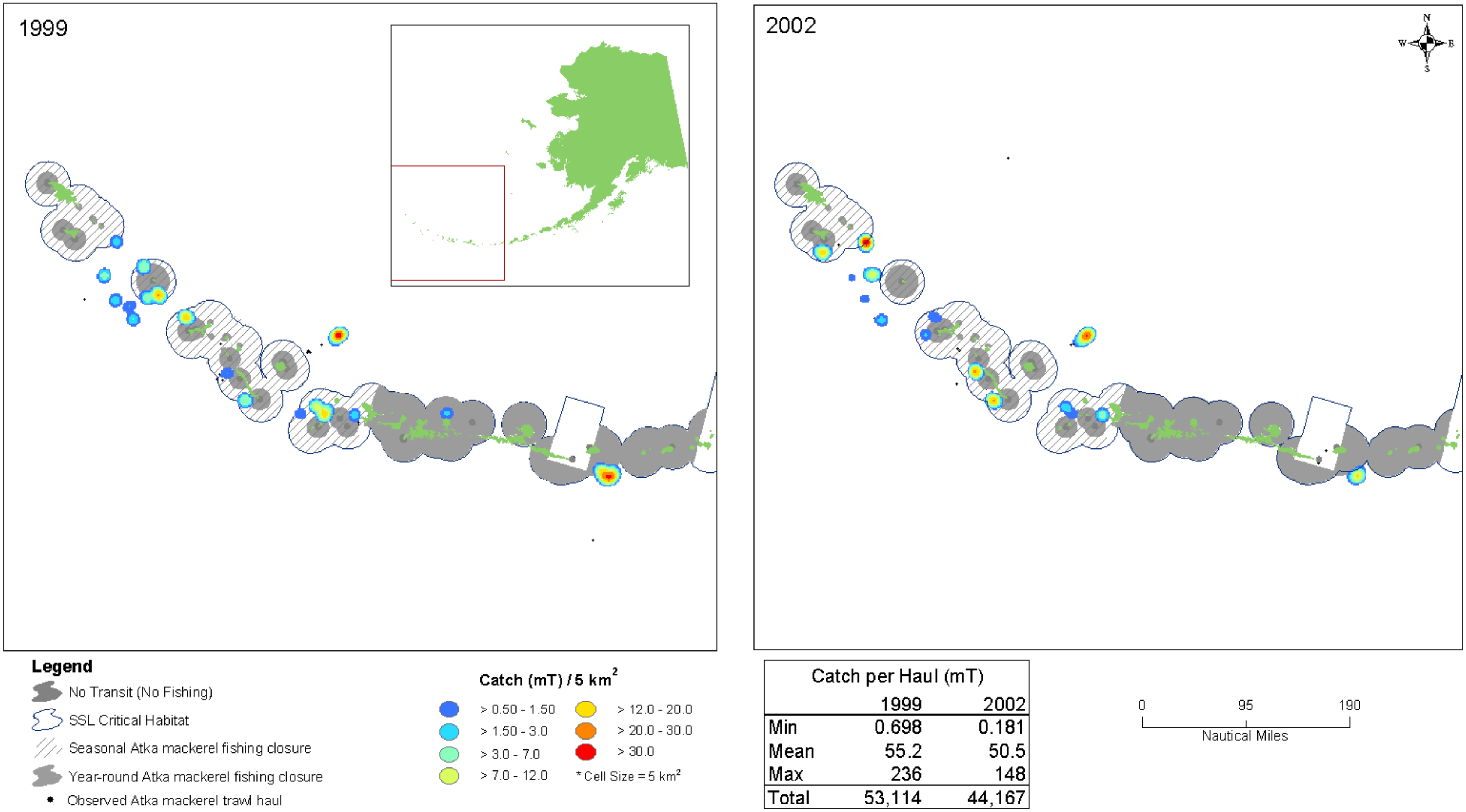


Catch per Haul (mT)

	1999	2002
Min	0.103	0.512
Mean	26.4	30.6
Max	123	144
Total	13,901	26,059



Appendix V. Figure 9. Distribution of observed AI Atka mackerel trawl catch in 1999 and 2002 and AI Atka mackerel trawl closures in effect in 2002. Density surfaces of Atka mackerel catch (mT/ 5 km^2) were generated from observer haul data that were expanded up to the annual 'Blend' total. Atka mackerel catch density was classified into seven categories using natural breaks (Jenks). Categories generated from natural breaks were manually adjusted to standardize the legend between years.



Catch per Haul (mT)		
	1999	2002
Min	0.698	0.181
Mean	55.2	50.5
Max	236	148
Total	53,114	44,167