Final

Marine Mammal Protection Act
Section 101(a)(5)(E) – Negligible Impact Determination

Humpback Whale, Central North Pacific stock
Humpback Whale, Western North Pacific stock
Steller Sea Lion, Western U.S. stock
Steller Sea Lion, Eastern U.S. stock
Fin Whale - Northeast Pacific stock
Sperm Whale – North Pacific Stock

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National Marine Fisheries Service
Protected Resources Division
Alaska Regional Office

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1.0 Executive Summary

Section 101(a)(5)(E) of the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1371(a)(5)(E)) requires the National Marine Fisheries Service (NMFS) to authorize the incidental taking of individuals from marine mammal species or stocks listed as threatened or endangered under the Endangered Species Act (ESA), as amended (16 U.S.C. 1531 et seq.) in the course of commercial fishing operations only after NMFS determines, among other things, that mortality and serious injury (M/SI) incidental to commercial fishing will have a negligible impact on the affected species or stock.

The purpose of this document is to conduct the analysis necessary to determine whether the M/SI incidental to U. S. commercial fisheries will have a negligible impact to ESA-listed species taken in commercial fisheries in the U.S. Exclusive Economic Zone (EEZ) offshore of Alaska. The determination follows a process previously described and implemented by the NMFS when issuing incidental take permits (e.g., 75 FR 29984, May 28, 2010).

The ESA-listed species determined to interact with commercial fisheries the Alaska region include those listed as endangered: the Central North Pacific (CNP) stock of humpback whales (*Megaptera novaeangliae*), the Western North Pacific (WNP) stock of humpback whales (*Megaptera novaeangliae),* the Western U.S. stock of Steller sea lions (*Eumetopias jubatas*), the Northeast Pacific (NEP) stock of fin whale (*Balaenoptera physalus),* and the North Pacific stock of sperm whales (*Physeter macrocephalus*) – or threatened: the Eastern U.S. stock of Steller sea lions.

A Negligible Impact Determination (NID) was prepared recently for the CNP humpback whale in Hawaiian and Alaskan waters (75 FR 29984, May 28, 2010) which remains current. NMFS reviewed information obtained since the NID was completed and confirmed that the current NID for this stock remains valid.

Based on a review of the best available information on population status and trends, M/SI rates due to commercial fishing and all other known sources of human related activities (e.g., harvest, ship strike, illegal shooting) the NMFS concludes here that the incidental M/SI from commercial fishing in Alaska waters would have a negligible impact on the WNP stock of humpback whales, the NEP stock of fin whales, the North Pacific stock of sperm whales, the Western U.S. stock of Steller sea lions, and the Eastern U.S. stock of Steller sea lions.

2.0 Introduction

Section 101(a)(5)(E) of the MMPA provides for NMFS, as delegated by the Secretary of Commerce, to issue permits for the taking of marine mammals designated as depleted because of their listing under the ESA by U.S. vessels and those vessels which have valid fishing permits issued by the Secretary in accordance with section 204(b) of the Magnuson-Stevens Fishery Conservation and Management Act for a period of up to three years. NMFS may issue the authorization to take ESA-listed marine mammals incidental to these commercial fisheries only after the agency has determined, after notice and opportunity for public comment, that:

(1) the incidental M/SI from commercial fisheries will have a negligible impact on the affected species or stock;

(2) a recovery plan has been developed or is being developed for such species or stock under the ESA; and

(3) where required under section 118 of the MMPA, a monitoring program has been established, vessels engaged in such fisheries are registered in accordance with section 118 of the MMPA, and a take reduction plan has been developed or is being developed for such species or stock.

The purpose of this document is to explain the analysis and rationale for determining whether the M/SI incidental to U. S. commercial fisheries will have a negligible impact (*i.e.*, determination (1), above) on the following species listed as endangered under the ESA: the CNP stock of humpback whales, the WNP stock of humpback whales, the NEP stock of fin whale, the North Pacific stock of sperm whales, and the Western U.S. stock of Steller sea lions; and a species listed as threatened under the ESA: the Eastern U.S. stock of Steller sea lions. Commercial fisheries in Alaska within the range of these populations have been observed to interact with and, in some cases, cause incidental serious injury or mortality to, these species. Determinations regarding (2) recovery plans, and (3) the requirements of MMPA section 118, are made in the final *Federal Register* notice to issue the necessary permits under MMPA section 101(a)(5)(E).

2.1 History, Process and Criteria for Issuing a 101(a)(5)(E) Permit

Among the requirements of MMPA section 101(a)(5)(E) to issue a permit to take ESA-listed marine mammals incidental to commercial fishing, NMFS must determine whether the taking of marine mammals would have a negligible impact on the affected species or stock(s) of marine mammals. Such determinations are required only under MMPA section 101(a)(5) and are currently required in authorizing the take of small numbers of any stock of marine mammals incidental to activities other than commercial fishing (termed the "Small Take Program") (sections 101(a)(5)(A) & (D)) or in permitting the take of threatened or endangered marine mammals incidental to commercial fishing operations (section 101(a)(5)(E)).

Within the MMPA's provisions for the Small Take Program, NMFS must determine if the taking (by harassment, injury, or mortality – or a combination of these) incidental to specified activities will have a negligible impact on the affected species or stock(s) of marine mammals. For permitting the take of threatened or endangered marine mammals incidental to commercial fishing operations, NMFS must determine if M/SI incidental to commercial fisheries will have a negligible impact on the affected species or stock(s) of marine mammals.

NMFS has implemented programs to authorize, including a qualitative definition of negligible impact, through regulations and has relied upon qualitative and quantitative approaches to quantify the levels of taking that would result in a negligible impact to affected stocks of marine mammals. The quantitative approach is easier to assess for serious injury and mortality than for non-lethal takes because M/SI are considered removals from the population and can be evaluated by well-documented models of population dynamics.

2.1.1 Qualitative Guidance to Initial Quantified Approach

The MMPA does not define the term "negligible impact." There is, however, a reference to negligible impact in the House of Representatives committee report for the MMPA Amendments of 1981, which are the amendments that added the "negligible impact" provisions to the MMPA. The report states, "'negligible' is intended to mean an impact which is able to be disregarded. In this regard, the committee notes that Webster's Dictionary defines the term 'negligible' to mean 'so small or unimportant or of so little consequence as to warrant little or no attention'" (House of Representatives, Report 97-228, September 16, 1981). NMFS' implementation of the 1981 amendments included a regulatory definition:

> An impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival. 50 CFR 216.103.

This qualitative definition of negligible impact was the standard NMFS used to implement the Small Take Program from its beginning in 1981 through 1994, when additional amendments to the MMPA required a more quantitative approach for assessing what level of removals from a population stock of marine mammals could be considered a negligible impact. It remains the only formal definition of negligible impact for implementing the MMPA.

The MMPA Amendments of 1994 were enacted primarily to establish a regime to govern the taking of marine mammals incidental to commercial fishing operations. These amendments were based in large part on a legislative proposal NMFS submitted to Congress in 1992. This legislative proposal was, in turn, based in large part on recommended guidelines from the Marine Mammal Commission (Commission) in early 1990 (Recommended Guidelines to Govern the Incidental Taking of Marine Mammals in the Course of Commercial Fishing Operations after October 1993, transmitted to NMFS under a cover letter from John Twiss, dated July 12, 1990). The Commission's guidelines were required by MMPA section 114(l)(4). In these guidelines, the Commission recommended, among five other characteristics of a mechanism to govern the take of threatened and endangered marine mammals incidental to fishing, "…the authorized level of take would have a negligible effect on population size and recovery time..." The Commission provided quantitative guidance on negligible effect on population size and recovery time in the following:

> an effect that (a) will not cause or contribute to a further decline in distribution or size lasting more than twelve months [[1]]; and/or (b) will not cause greater than a 10% increase in the best available estimate of the time it will take the affected species or population to recover to its maximum net productivity level [MNPL].[2]

With the recommendation above, the Commission's guidelines for establishing the regime to govern interactions between marine mammals and commercial fishing contained the first quantitative approach for assessing whether a certain level of take could be considered negligible. The two-part recommendation suggests that a take would be negligible if it had an effect lasting no more than twelve months (that is, one that would be so small that it could not be detected from natural variability or would be expected to be alleviated by the next breeding season) or would delay the period of recovery by no more than 10%. The first of these quantitative approaches is likely more appropriate for the Small Take Program than for commercial fisheries. A specified activity would likely have a relatively short duration relative to the life expectancy of the affected stocks of marine mammals; thus, it could be considered an instantaneous perturbation.

The first recommended criterion would also be appropriate for M/SI incidental to commercial fishing in cases where the take of threatened or endangered marine mammals was a rare event (*i.e*., occurred only once in a ten to twenty-year period). Where incidental mortality or serious injury is likely to occur on a more regular basis, as it does with most interactions with commercial fishing, the "instantaneous" approach would likely not be appropriate, and the delay-in-recovery standard would be favored.

2.1.2 A Quantitative Approach

The Commission's guidelines suggested the beginnings of a quantitative approach to distinguish between negligible and non-negligible impact, and NMFS has used the Commission's delay-in-recovery guideline consistently. To apply this criterion, however, NMFS had to estimate what annual levels of incidental M/SI would cause no more than a 10% delay in time to recovery. Such an effort was initiated at the NMFS-convened workshop (June 1994) to develop guidelines for preparing marine mammal stock assessment reports. Among the many items considered at that workshop, participants agreed that recovery factors (RF) used in the calculation of Potential Biological Removal (PBR)[3] for each stock of marine mammals should compensate for

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[1] "Further Definition of Negligible Effect. It can be argued that the take of a single animal from a population that is stable or declining will cause or contribute to a population decline. While this may be true in an absolute sense at a fixed point in time, the effect on population size of small removals may be less than the effect of natural fluctuations in individual survival and reproductive rates. The purpose of this criterion is to prevent a determination that any lethal take, no matter how small, will inevitably cause a population decline, and therefore cannot be authorized. At the same time, it is intended to prohibit taking that would cause or contribute to a further decline in population distribution or size" (Marine Mammal Commission 1990).

[2] MNPL is the population size that results in the greatest net annual increment in population numbers or biomass resulting from additions to the population due to reproduction and/or growth less losses due to natural mortality. [*See* maximum net productivity in the definition of Optimum Sustainable Population (OSP), 50 CFR 216.3]. MNPL is the lower limit of a population stock's OSP and is, thus, the major recovery goal for depleted stocks under the MMPA.

[3] *See infra* page 24, for discussion of PBR.

uncertainty and possible unknown estimation errors. In discussing the recovery factor for stocks of endangered species of marine mammals, participants noted that an RF of 0.1 would preserve 90% of net annual production for recovery of the stock, limiting the proportion of net annual production of the stock available for authorization of mortality or serious injury incidental to human-caused mortality. Participants also stated that reserving such a high proportion of net annual production of endangered species was appropriate to "…allow stocks to recover at near maximum rates, and to minimize the probability that naturally occurring stochastic mortality would result in extinction of the stock." (Barlow *et al*. 1995 at 10) Workshop participants also noted, "authorized levels of human-related mortality should increase recovery time of endangered stocks by no more than 10% (consistent with the goal stated in NMFS legislative proposal)." (Barlow *et al*. 1995 at 11, 12). Consequently, participants at the workshop recommended, and NMFS accepted (after public review and comment), that M/SI remaining at or below PBR for an endangered stock (with 0.1 as the RF in the PBR calculation) would have a negligible impact on the affected stock.

In applying the negligible impact criterion to determinations made initially under the MMPA Amendments of 1994, NMFS understood that total human-caused M/SI limited to a level no greater than a PBR calculated with RF of 0.1 would be negligible; however, MMPA section 101(a)(5)(E) required a determination related to the impact of M/SI incidental to commercial fishing rather than incidental to all human activities. Accordingly, NMFS proposed to use, and subsequently used, 10% of any stock's PBR as the upper limit of M/SI incidental to commercial fishing in making the first negligible impact determinations[4] (60 FR 31666, June 16, 1995 (proposed) and 65 FR 45399, August 31, 1995 (final)). A rationale supporting this approach was that a negligible (or insignificant) level of fishery-related M/SI should be only a small portion of the maximum level of M/SI a stock could sustain. NMFS noted that the threshold value was a starting point; that is, the criterion should not be used rigidly, but should produce the first estimate, which, in turn, could be modified on a case-by-case basis according to existing information. Although 10% of PBR was used in 1995 in issuing permits to fisheries under MMPA section 101(a)(5)(E), NMFS removed this provision from the final rule when implementing the threshold level of mortality that would be considered insignificant levels approaching a zero M/SI rate from its implementation of the ZMRG.

In 1996, when NMFS marine mammal assessment scientists and managers, representatives of the U.S. Fish and Wildlife Service, representatives of the Commission, and members of regional Scientific Review Groups reviewed the guidelines for preparing marine mammal stock assessment reports, participants discussed RFs and the use of 10% of PBR as an upper limit for insignificant levels of removals. Participants noted that the use of 0.1 as the RF for many stocks of endangered species, especially some of the large whales, could be too conservative. The workshop did not recommend a new default RF for large whales, but noted that the guidelines should be clarified to allow some flexibility to depart from default values when there is justification to do so.

[4] In 1995 NMFS used 10% of PBR as an upper limit of M/SI that could be considered negligible and that could also be considered an insignificant level of incidental M/SI approaching a zero M/SI rate. The latter of these is the "target" level of M/SI that NMFS applied to the MMPA's Zero Mortality Rate Goal (ZMRG) (69 FR 43338, July 20, 2004).

Workshop participants also discussed the use of 10% of PBR as a threshold value for insignificant levels of M/SI of marine threatened and endangered species, which was at the time equated with a level of M/SI that would result in a negligible impact to the affected stock of marine mammals. Some of the participants at the workshop stated, "…the PBR for endangered stocks was already set at a level that was thought, in one sense, to be insignificant to the recovery of the stock, so that 10% of that level was perhaps an overly conservative number" (Wade and Angliss 1997). Although participants agreed that 10% of PBR was an appropriate threshold value for insignificant levels of mortality for stocks with an RF of 0.5, there was not a general agreement on an appropriate quantitative value for endangered stocks with RF of 0.1. Workshop participants suggested a possible alternative would be to use a case-specific approach for endangered whales with a starting point as a fixed percentage of the minimum population estimate.[5]

Wade (1998) summarized the robustness trials conducted in support of the PBR approach for marine mammal conservation, including an aspect that was missing from simulations conducted for the NMFS-convened workshop in 1994: exploring the maximum level of annual removals from a population that would result in no more than a 10% delay in the time a population would need for recovery to its MNPL. Wade (1998) found that an upper limit of annual removals equal to the value of a PBR calculation with an RF of 0.15 would allow 95% of simulations to equilibrate at or above MNPL, which was an initial step in quantifying the maximum number of annual removals resulting in a negligible impact. However, the negligible impact standard as applied in the Small Take Program and for ZMRG must also address a performance criterion for marine mammal stocks that are not necessarily depleted. Wade (1998) also reported that an upper limit of annual mortality limited to a value equal to a PBR calculation with an RF of 0.1 would allow 95% of simulations to equilibrate within 95% of the carrying capacity of the affected stock of marine mammals.

Wade's (1998) performance testing included removals to the threshold level for a period of 100 years and evaluated the robustness of each case over a range of bias or uncertainty in productivity rates, abundance estimation, and mortality estimation. Thus, the limits are appropriate for use on long-term average removals and do not indicate that a short-term level of removal exceeding the threshold would delay time to recovery by more than 10%.

In 1998, NMFS published a notice (63 FR 71894, December 30, 1998) advising the public that the agency was extending the 3-year permit issued to fisheries in 1995 to authorize the taking of threatened or endangered marine mammals. This notice also informed the public that NMFS considered the 6-month extension of the permit an opportunity to review existing criteria for the issuance of permits and to address issues that have arisen since the permits were first issued. NMFS solicited public comments to develop alternatives to 10% of PBR as a criterion for determining negligible impact. No public comments were received.

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[5] Minimum population estimate is defined in the MMPA to mean an estimate of the number of animals in a stock that—

> (a) is based on the best available scientific information on abundance, incorporating the precision and variability associated with such information; and
> (b) provides reasonable assurance that the stock size is equal to or greater than the estimate. MMPA section 2(27).

Having received no comments upon which to develop alternatives for determining negligible impact, NMFS published a notice proposing to issue permits under MMPA section 101(a)(5)(E) in 1999 (64 FR 28800, May 27, 1999). The notice contained a statement that NMFS, through internal deliberation, had adopted the following criteria for making negligible impact determinations (NID) for such permits:

> 1. The threshold for initial determination will remain at 0.1 PBR. If total human-related serious injuries and mortalities are less than 0.1 PBR, all fisheries may be permitted.
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> 2. If total human-related serious injuries and mortalities are greater than PBR, and fisheries-related mortality is less than 0.1 PBR, individual fisheries may be permitted if management measures are being taken to address non-fisheries-related serious injuries and mortalities. When fisheries-related serious injury and mortality is less than 10 percent of the total, the appropriate management action is to address components that account for the major portion of the total.
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> 3. If total fisheries-related serious injuries and mortalities are greater than 0.1 PBR and less than PBR and the population is stable or increasing, fisheries may be permitted subject to individual review and certainty of data. Although the PBR level has been set up as a conservative standard that will allow recovery of a stock, there are reasons for individually reviewing fisheries if serious injuries and mortalities are above the threshold level. First, increases in permitted serious injuries and mortalities should be carefully considered. Second, as serious injuries and mortalities approach the PBR level, uncertainties in elements such as population size, reproductive rates, and fisheries-related mortalities become more important.
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> 4. If the population abundance of a stock is declining, the threshold level of 0.1 PBR will continue to be used. If a population is declining despite limitations on human-related serious injuries and mortalities below the PBR level, a more conservative criterion is warranted.
>
> 5. If total fisheries-related serious injuries and mortalities are greater than PBR, permits may not be issued.

This set of criteria maintained 10% of PBR (from 1995) as the starting point in negligible impact determinations and explicitly noted ways in which determinations could deviate from the default. Criterion 3 notes that NMFS may give special consideration if the affected stock of marine mammals is stable or increasing and may permit take incidental to fishing even if incidental removals exceed 10% of PBR, but are below PBR.

A marine mammal species or population stock which is listed under the ESA is by definition also considered depleted under the MMPA.

2.2 ESA-Listed Marine Mammals Considered in this Analysis

Six species of ESA listed marine mammals are considered in this analysis: the endangered CNP humpback whale, the WNP humpback whale, the NEP stock of fin whales, the North Pacific sperm whale, and the Steller sea lion, Western U.S. stock, and the threatened Steller sea lion, Eastern U.S. stock. U. S. commercial fisheries within the range of these four species have been observed to interact with and, in some cases, cause incidental serious injury or mortality to individuals from these populations.

On August 31, 1995, NMFS issued a three-year permit for those commercial fisheries that were determined to have negligible impacts on ESA-listed marine mammal stocks, including three of these species (60 FR 45399) (with the WNP humpback having been excluded on the basis of having no reported or observed fisheries related mortalities, see (1) below). This permit was extended through June 30, 1999 (63 FR 71894, Dec. 30, 1998). On May 27, 1999, NMFS proposed issuing additional three-year permits for the incidental takes of the same three populations in commercial fishing operations (64 FR 28800). That notice included the above-referenced 1999 criteria for making a NID under section 101(a)(5)(E).

Using these criteria, the impact of commercial fisheries on specific stocks of endangered and threatened marine mammals can be divided into three groups: (1) stocks with no fisheries related mortalities for which permits are not necessary; (2) stocks ineligible for permits under criteria 4 and 5; and (3) stocks for which commercial fisheries are eligible for permits provided other provisions of section 101(a)(5)(E) of the MMPA are met. Based on 1999 criteria, the 2009 Marine Mammal Stock Assessment Reports (SAR; Allen and Angliss 2010), and the best scientific information and data available, NMFS has determined that CNP humpback whales, WNP humpback whales, NEP Stock of Fin whales, the North Pacific stock of sperm whales, the Western U.S. stock Steller sea lions, and the Eastern U.S. stock of Steller sea lions fall within group (3), above. Accordingly, NMFS has reevaluated whether issuance of a permit under section 101(a)(5)(E) is appropriate. The following is NMFS' analysis and finding of whether the impacts caused by the U.S. commercial fisheries within the range of these subject species or stocks may be considered negligible.

3.0 Action Area (Alaska)

The action area includes all Federally-managed and parallel-State of Alaska groundfish fisheries that operate within the Alaska EEZ and state waters (Figure 1).

4.0 Category I, II, and III Fisheries in the Action Area – Alaska

Under the MMPA, fisheries are categorized on a per-stock basis, thus a fishery may qualify as one Category for one marine mammal stock and another Category for a different marine mammal stock. A fishery is typically categorized on the List of Fisheries (75 FR 68468, November 8, 2010) at its highest level of classification (e.g., a fishery qualifying for Category III for one marine mammal stock and for Category II for another marine mammal stock will be listed under Category II). Category I fisheries have frequent incidental M/SI of marine mammals, and Category II fisheries have occasional incidental M/SI of marine mammals. Category III fisheries have a remote likelihood of, or no known, incidental M/SI, of marine mammals. Additional details are provided in the preamble to the proposed rule implementing section 118 of the MMPA (60 FR 45086, August 30, 1995).

Based on the 2011 List of Fisheries (75 FR 68468, November 8, 2010), there are no Category I fisheries in the action area. Table 1 provides details concerning all Category II fisheries for the action area. Under MMPA 101(a)(5)(E) permits are not required for Category III fisheries; however, M/SI incidental to all fisheries, regardless of category, are included in this analysis. There are 138 commercial fisheries listed as Category III in the Pacific Ocean (57 of these in Alaska waters) within the range of the listed marine mammals considered by this analysis; mortality or serious injury to these listed species has been reported at some point in 22 of these fisheries.

Federally-Managed Groundfish Fisheries and parallel-State of Alaska Groundfish Fisheries

Description of the Fisheries

The following are the only fisheries classified as Category II in the 2011 List of Fisheries (75 FR 68468, November 8, 2010) which are known to incidentally seriously injure or kill ESA-listed marine mammals in the process of conducting commercial fishing operations. Detailed descriptions of these fisheries can be found in the June 2004 Alaska Groundfish Fisheries Final Supplemental Programmatic Environmental Impact Statement (http://alaskafisheries.noaa.gov/sustainablefisheries/seis/) and in the November 2010 Biological Opinion for *Authorization of Groundfish Fisheries under the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Island Management Area, Authorization of Groundfish Fisheries under the Fishery Management Plan for Groundfish of the Gulf of Alaska, and the State of Alaska Parallel Groundfish Fisheries* ("BiOp;" NMFS 2010a) available at: http://www.alaskafisheries.noaa.gov/protectedresources/stellers/esa/biop/final/1210.htm). For purposes of brevity, these fisheries henceforth are collectively referred to as the "Alaska groundfish fisheries." A brief description follows (vessel count data from Hiatt et al 2010).

Bering Sea Aleutian Islands (BSAI) flatfish trawl

In 2008 the Amendment 80 program allocated most of the BSAI rock sole, flathead sole, and yellowfin sole allocations to the trawl catcher processor sectors using bottom trawl gear. Other vessel categories and gear types catch some rock sole, flathead sole, other flatfish incidentally in other directed fisheries. In 2009, 30 vessels targeted flatfish in the BSAI. Rock sole is generally targeted during the roe season. Then these vessels shift to several different targets; notably Atka mackerel, arrowtooth flounder, flathead sole, yellowfin sole, Pacific cod, and Pacific ocean perch. Vessels also can go into the Gulf of Alaska to fish for arrowtooth, Pacific cod, flathead sole, and rex sole. In the BSAI, most of the rock sole, flathead sole, and other flatfish fisheries occur on the continental shelf in the eastern Bering Sea in water shallower than 200 m. Some effort follows the contour of the shelf to the northwest and extends as far north as Zhemchug Canyon. Very few rock sole, flathead sole, and other flatfish are taken in the Aleutian Islands due to the limited shallow water areas present.

Bering Sea Aleutian Islands pollock trawl

In 2009, 117 vessels targeted pollock in the Bering Sea and Aleutian Islands management area. The pattern of the modern pollock fishery in the BSAI is to focus on a winter, spawning-aggregation fishery. The A season fishery is January 20 through June 10. Fishing in this season lasts about 8-10 weeks depending on the catch rates. The B season is June 10 through November 1. Fishing in the B season is typically September through October and has been conducted to a greater extent west of 170/W longitude compared to the A season fishing location in the southern Bering Sea. Directed fishing is closed for pollock in all areas from November 1 to January 20. Fishing is also closed around designated rookeries and haulouts out to 20 nm and closed within Steller sea lion foraging areas in the Bering Sea and Aleutian Islands. The Bering Sea pollock total allowable catch (TAC) is allocated 40 percent to the A season and 60 percent to the B season. No more than 28 percent of the annual directed fishing allowance for pollock can be taken inside the Sea Lion Conservation Area (SCA) in the southern Bering Sea before April 1.

Bering Sea Aleutian Islands Pacific cod longline

In 2009 55 vessels targeted Pacific cod using hook-and-line gear. Hook-and-line harvested Pacific cod are mostly taken along the slope of the continental shelf break and along the Aleutian Islands. Harvest is seasonally apportioned to A and B seasons for vessels greater than 60 feet length overall. The A season is January 1 through June 10 and the B season is June 10 through December 31. The annual TAC is apportioned 60 percent to the A season and 40 percent to the B season.

Bering Sea sablefish pot

Sablefish are harvested in relatively deep water along the continental slope (100–1,000 m) and along the Aleutian Islands. From 1996 to 2007, directed fisheries for sablefish have only been open to vessels using hook-and-line and pot gear in the BSAI. In 1995, sablefish (as well as Pacific halibut) became a closed fishery for fixed gear based on historical participation. An individual fishing quota (IFQ) program was implemented, which assigns quota shares on an annual basis to authorized fishermen (50 CFR 679(d)). The directed sablefish fishery is open only to IFQ shareholders who use fixed gear (hook-and line or pot gear) and starting in 2008 trawl catcher processors in the Amendment 80 cooperative. In 2009, 10 pot catcher vessels were active in this fishery.

State of Alaska Fisheries

The NMFS/Alaska Regional Office operates a marine mammal observer program which collects information on marine mammal interactions in ten Category II state-managed commercial fisheries targeting salmon (Table 2). Due to the high cost of observing these fisheries, only one or two fisheries were observed at a time for one to two years. To date, seven state fisheries have been observed in this way. Of those, one has been re-categorized to Category III due to minimal interactions with marine mammals (Prince William Sound set gillnet salmon fishery).

Bristol Bay Set and Drift Gillnet Fisheries

The Bristol Bay management area includes all coastal and inland waters from Cape Newenham to Cape Menshikof and includes five management districts. There are eight major river systems in the area, and these form the largest commercial sockeye salmon fishery in the world. Although sockeye salmon is by far the most abundant salmon species that returns to Bristol Bay each year, chinook, chum, coho, and pink salmon returns are important as well. About 80% of the catch is with drift gillnets and 20% with set gillnets.

Alaska Peninsula Set Gillnet Fishery

The Alaska Peninsula set gillnet fishery takes place in two districts on the north of the peninsula (Northern and Northwestern), and four districts on the south of the peninsula (Unimak, Southwestern, Southcentral and Southeastern).

Cook Inlet Drift Gillnet and Set Gillnet Fisheries

The Upper Cook Inlet contains two fisheries management districts, with salmon driftnet fishing in the Central District. This fishery and the set gillnet fishery, are the primary commercial fisheries in the Upper Cook Inlet. The fishery usually runs from June 25 until August 9. Currently driftnet fishing only occurs in the entire Central District areas for the two regular 12 hour openers on Mondays and Thursdays, with extra fishing restricted to another drift corridor, as detailed in the management plan. Fishing effort peaks in mid to late July for sockeye. The productive driftnet fishing season is relatively short in Cook Inlet, and many boats also fish other areas before and after the salmon driftnet season. Driftnet fishing accounts for about 60% of the average annual salmon harvest for the region. This fishery and the Cook Inlet set gillnet fishery were observed for marine mammal interactions in 1999 and 2000.

Notices of fishing openers are posted weekly and announced on regular radio channels. There are usually two regular openers a week of 12 hours each, but may be extended by Emergency Order. However, the fishing effort can change at any time because of alterations in management policy, the salmon run strength, the price of fish, and strikes within the industry. The duration of sets can vary from 20 minutes to four or more hours, depending on fishing conditions and other variables, with between four and 20 sets per day. In general, fishing only occurs during daylight hours.

Kodiak Island Set Gillnet Fishery

The fishery consists of the Northwest District, from Spruce Island to the south side Uyak Bay, and the Alitak Bay District, located on the southwestern corner of the island. In most years, the Northwest District is fished by about 100 permit holders and constitutes about 70% of the annual fishing effort, while the Alitak Bay District has about 70 permit holders and about 30% of the annual fishing effort.

The fishery begins between the 5th and the 9th of June. Traditionally, the Northwest District is open for the majority of June and July, while the Alitak Bay District typically fishes from five to seven out of every ten days. As the runs progress, changing from sockeye to pink salmon in late July, the Alaska Department of Fish and Game (ADFG) often reduces the length of openers if escapement goals have not been met. Fishing effort begins to reduce in mid to late August as runs begin to decline, and although many areas are open until early October, most fishers have pulled their nets by early September. Most nets are attached to a shore lead up to 80 fathoms long in a straight line to a king buoy offshore, with numerous anchor lines and buoys holding the net in place. The last 25 fathoms is usually formed into a fish trap, which is also called a hook.

Prince William Sound Drift Gillnet Fishery

The Prince William Sound Fisheries Management Area consists of 11 districts. The fishing gear employed for salmon includes drift and set gillnets and purse seines. Drift gillnet fishing permits are most common. Six hatcheries contribute to the salmon fisheries. The management objective in all 11 districts is the achievement of salmon escapement goals for the major stocks while allowing for the orderly harvest of all fish that are surplus to the spawning requirements. The ADFG also follows regulatory plans to manage the fisheries, and to allow private non-profit hatcheries to achieve cost recovery and broodstock objectives.

Yakutat Set Gillnet Fishery

The Yakutat set gillnet fisheries are divided into two fishing districts, the Yakutat District and the Yakataga District. The Yakutat District fisheries primarily target sockeye salmon and coho salmon although all species of salmon are harvested. The Yakataga District fisheries target coho salmon. The bulk of the Yakutat salmon harvest is usually reported from a few fisheries, but as many as 25 different areas are open to commercial fishing each year. With few exceptions, gillnetting is confined to the intertidal area inside the mouths of the various rivers and streams, and to the ocean waters immediately adjacent to each. Due to the terminal nature of these fisheries, ADFG has been able to develop escapement goals for most of the major and several of the minor fisheries.

Southeast Alaska Drift Gillnet Fishery

There are five fishing areas in the Southeast Alaska drift gillnet fishery. In addition, some fishing is permitted in terminal harvest areas (THAs) that are adjacent to hatchery facilities, some is permitted for hatchery cost recovery, and some at Annette Island. Most salmon are caught by drift gillnets in the five main fishing areas (81% in 2003) and the THAs (13% in 2003), with small contributions from Annette Island (4% in 2003), and hatchery cost recovery (1.8% in 2003). Fishing generally continues from the middle of June through to early October.

Southeast Alaska Purse Seine Fishery

The purse seine fishery accounts for about 80% of the total salmon harvest in the Southeast Alaska region, with about 87% of the fish caught being pink salmon. Regulations allow purse seine fishing in certain fishing districts, and also in certain terminal harvest areas, hatchery cost recovery areas, and the Annette Island Fishery Reserve. In 2003, purse seine fishing ran from 1 June until 12 November in THAs, and from 22 June until 30 September in the Fishing Districts.

5.0 Central North Pacific Humpback Whales

NMFS issued (75 FR 8305, February 24, 2010) a draft Negligible Impact Determination (NID) for the CNP humpback whale for fisheries within the EEZ waters of U.S. Pacific Islands and Alaska (NMFS 2010b). The NID for CNP humpback whales was finalized by announcement (75 FR 29984, May 28, 2010) of the issuance of a permit to authorize the incidental, but not intentional, taking of individuals of the CNP stock of endangered humpback whales by the Hawaii-based longline fisheries (deep-set and shallowset). The NID for CNP humpback whales (http://www.fpir.noaa.gov/Library/PRD/Humpback%20Whale/Final%20NID%205-2010.pdf) remains valid and in effect for the subject groundfish fisheries in Alaska; therefore, that stock is not considered further here.

6.0 Western North Pacific Humpback Whales

6.1 Species Information

For this assessment of negligible impact, NMFS considered the impact of serious injury and mortality to WNP humpback whales resulting from interactions with the above-described fisheries. This section discusses species information, the current status of WNP humpback whales, and threats to the stock. The time frame for the data used in this analysis is the five-year period from 2002 through 2006, where recent data are available. The information in this section is from the WNP humpback whale draft 2010 Stock Assessment Report (Allen and Angliss 2010).

The humpback whale is distributed worldwide in all ocean basins. In winter, most humpback whales occur in the subtropical and tropical waters of the Northern and Southern Hemispheres. Humpback whales in the high latitudes of the North Pacific are seasonal migrants that feed on euphausiids and small schooling fishes (Nemoto 1957; 1959, Clapham and Mead 1999). The humpback whale population was considerably reduced as a result of intensive commercial exploitation during the 20th century. A large-scale study of humpback whales throughout the North Pacific was conducted in 2004-06 (the Structure of Populations, Levels of Abundance, and Status of Humpbacks, or SPLASH, project). Initial results from this project (Calambokidis et al. 2008), including abundance estimates and movement information, are used in this report. Genetic results, which may provide a more comprehensive understanding of humpback whale population structure in the North Pacific, should be available in the near future.

The historic summer feeding range of humpback whales in the North Pacific encompassed coastal and inland waters around the Pacific Rim from Point Conception, California, north to the Gulf of Alaska and the Bering Sea, and west along the Aleutian Islands to the Kamchatka Peninsula and into the Sea of Okhotsk and north of the Bering Strait (Zenkovich 1954, Nemoto 1957, Tomlin 1967, Johnson and Wolman 1984). Historically, the Asian wintering area extended from the South China Sea east through the Philippines, Ryukyu Retto, Ogasawara Gunto, Mariana Islands, and Marshall Islands (Rice 1998). Humpback whales are currently found throughout this historic range, with sightings during summer months occurring as far north as the

Beaufort Sea (Hashagen et al. 2009). Most of the current winter range of humpback whales in the North Pacific is relatively well known, with aggregations of whales in Japan, the Philippines, Hawaii, Mexico, and Central America.

Photo-identification data, distribution information, and genetic analyses have indicated that in the North Pacific there are at least three breeding populations (Asia, Hawaii, and Mexico/Central America) that all migrate between their respective winter/spring calving and mating areas and their summer/fall feeding areas (Calambokidis et al. 1997, Baker et al. 1998). Calambokidis et al. (2001) further suggested that there may be as many as six subpopulations on the wintering grounds. There are known connections between Asia and Russia, between Hawaii and Alaska, and between Mexico/Central America and California (Calambokidis et al. 1997, Baker et al. 1998, Darling 1991; 1993; Mizroch pers. comm., North Pacific Humpback Whale Working Group, unpublished data). This information led to the designation of three stocks of humpback whales in the North Pacific: 1) the California/Oregon/Washington and Mexico stock, 2) the CNP stock, and, 3) the WNP stock, consisting of winter/spring populations off Asia which migrate primarily to Russia and the Bering Sea/Aleutian Islands.

New information from the SPLASH project mostly confirms this view of humpback whale distribution and movements in the North Pacific. For example, the SPLASH results confirm low rates of interchange between the three principal wintering regions (Asia, Hawaii, and Mexico). However, the full SPLASH results suggest the current view of population structure is incomplete. The overall pattern of movements is complex but indicates a high degree of population structure.

The winter distribution of humpback whales in the WNP stock includes several island chains in the western North Pacific. The migratory destination of WNP humpbacks is not well known. Discovery tag recaptures have indicated movement of whales between areas in Japan and feeding areas in the Bering Sea, on the southern side of the Aleutian Islands, and in the Gulf of Alaska (Nishiwaki 1966, Omura and Ohsumi 1964, Ohsumi and Masaki 1975). Research on humpback whales at the Ogasawara Islands has documented recent movements of whales between there and British Columbia (Darling et al. 1996), the Kodiak Archipelago in the central Gulf of Alaska (Calambokidis et al. 2001), and the Shumagin Islands in the western Gulf of Alaska (Witteveen et al. 2004), but no photo-identification studies had previously been conducted in Russia.

SPLASH results indicate humpback whales from the WNP (Asian) breeding stock overlap broadly on summer feeding grounds with whales from the CNP breeding stock, as well as with whales that winter in the Revillagigedos in Mexico. Given the relatively small size of the Asian population, Asian whales probably represent a small fraction of all the whales found in the Aleutian Islands, Bering Sea, and Gulf of Alaska, which are primarily whales from Hawaii and the Revillagigedos. A full description of the distribution and density of humpback whales in the Aleutian Islands, Bering Sea, and Gulf of Alaska is in the Stock Assessment Report for the CNP stock of humpback whales (Allen and Angliss 2010).

In summary, information from a variety of sources indicates that humpback whales from the Western and CNP stocks mix to a limited extent on summer feeding grounds ranging from British Columbia through the central Gulf of Alaska and up into the Bering Sea.

6.2 Status of the Stock

Population size

Prior to the SPLASH study the only abundance estimates available for humpback whales on the Asian wintering grounds were from 1991-93. An average of pair-wise estimates for the years 1991-92, 1992-93, and 1991-93 results in an abundance estimate of 394 (CV = 0.084) (Calambokidis et al. 1997). This was an estimate for the Ogasawara Islands and Okinawa, but no data from the Philippines or other areas were included. During the SPLASH study surveys were conducted in three winter field seasons (2004-06). There were a total of 20 individuals seen in more than one area, leaving a total of 566 unique individuals seen in the Asian wintering areas. For abundance in winter or summer areas, a Hilborn mark-recapture model was used, which is a form of a spatially-stratified model that explicitly estimates movement rates between winter and summer areas. Two broad categories of models were used making different assumptions about the movement rates, and four different models were used for capture probability. Point estimates of abundance for Asia (combined across the three areas) were relatively consistent across models, ranging from 938 to 1107. The model that fit the data the best (as selected by AICc) gave an estimate of 1107 for the Ogasawara Islands, Okinawa, and the Philippines. Confidence limits or CVs have not yet been calculated for the SPLASH abundance estimates. Although no other high density aggregations of humpback whales are known on the Asian wintering ground, whales have been seen in other locations, indicating this is likely to represent an underestimate of the stock's true abundance to an unknown degree.

On the summer feeding grounds, the initial SPLASH abundance estimates for Kamchatka in Russia ranged from about 100-700, suggesting a large portion of the Asian population occurs near Kamchatka. No separate estimates are available for the other areas in Russia, the Gulf of Anadyr and the Commander Islands; abundance from those areas is included in the estimate of abundance for the Bering Sea and Aleutian Islands, which ranged from about 6000 to 14,000. Abundance estimates for the Gulf of Alaska and for Southeast Alaska/northern British Columbia both ranged from 3,000-5,000 (Calambokidis et al. 2008).

From line-transect surveys Moore et al. (2000) estimated abundance of humpback whales in the central Bering Sea as 1,175 humpback whales (95% CI: 197-7,009) in 1999, though Moore et al. (2002) suggested these sightings were too clumped in the central-eastern Bering Sea to be used to provide a reliable estimate for the area. Moore et al. (2002) estimated abundance as 102 (95% CI: 40-262) for humpback whales in the eastern Bering Sea in 2000. Zerbini et al. (2006) estimated abundance of humpback whales from line-transect surveys as 2,644 (95% CI 1,899–3680) for coastal/shelf waters from the central Gulf of Alaska through the eastern Aleutian Islands. Although there is a small amount over overlap between these surveys in the eastern Aleutian Islands, this suggests a combined total of about 4,000 whales, considerably less than the SPLASH abundance estimates, which range from 9,000 to 19,000 combined for the Aleutian Islands, Bering Sea, and Gulf of Alaska. However, the SPLASH surveys were more extensive in scope, including areas not covered in those surveys, such as parts of Russian waters (Gulf of Anadyr and Commander Islands), the western and central Aleutian Islands, offshore waters in the Gulf of Alaska and Aleutian Island, and Prince William Sound. Additionally, mark-recapture estimates can be higher than line transect estimates because they estimate the total number of whales that have used the study area during the study period, whereas line-transect surveys provide a snapshot of average abundance in the survey area at the time of the survey.

Current Population Trend

The SPLASH abundance estimate for Asia represents a 6.7% annual rate of increase over the 1991-93 abundance estimate for Asia (Calambokidis et al. 2008). However, the 1991-93 estimate was for Ogaswara and Okinawa only, whereas the SPLASH estimate includes the Philippines, so the annual rate of increase in biased high to an unknown degree. No confidence limits are available as yet for the rate of increase.

Current and maximum net productivity rates

Utilizing a birth-interval model, Barlow and Clapham (1997) have estimated a population growth rate of 6.5% (SE = 1.2%) for the well-studied humpback whale population in the Gulf of Maine, although there are indications that this rate has slowed in recent years (Clapham et al. 2003). Mobley et al. (2001) estimated a trend of 7% for 1993-00 using data from aerial surveys that were conducted in a consistent manner for several years across all of the Hawaiian Islands and were developed specifically to estimate a trend for the CNP stock.

Mizroch et al. (2004) estimated survival rates for North Pacific humpback whales using mark-recapture methods, and a Pradel model fit to data from Hawaii for the years 1980-1996 resulted in an estimated rate of increase of 10% per year (95% C.I. of 3-16%). For shelf waters of the northern Gulf of Alaska Zerbini et al. (2006) estimated an annual rate of increase for humpback whales from 1987-2003 of 6.6% (95% C.I. of 5.2-8.6%). The SPLASH abundance estimate for the total North Pacific represents an annual increase of 4.9% over the most complete estimate for the North Pacific from 1991-93. Comparisons of SPLASH abundance estimates for Hawaii to estimates from 1991-93 gave estimates of annual increase that ranged from 5.5 to 6.0% (Calambokidis et al. 2008). No confidence limits were calculated for these rates of increase from SPLASH data.

Although there is no estimate of the maximum net productivity rate for the Western U.S. stock, it is reasonable to assume that R_{MAX} for this stock would be at least 7%. Hence, until additional data become available from the WNP humpback whale stock, it is recommended that 7% be employed as the maximum net productivity rate (R_{MAX}) for this stock (Wade and Angliss 1997).

Potential Biological Removal

Under the 1994 reauthorized MMPA, the PBR is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a FR : PBR = N_{MIN} x $0.5R_{MAX}$ x FR. The FR for this stock is 0.1, the value for cetacean stocks listed as endangered under the Endangered Species Act (Wade and Angliss 1997). Using the smallest SPLASH abundance estimate calculated for 2004 - 2006 of 938 with an assumed CV of 0.300 for the WNP stock of humpback whale, PBR is calculated to be 2.6 animals (732 x 0.035 x 0.1). Alternatively, using the number of unique individuals seen during the SPLASH study results in a PBR of 2.0 (566 x 0.035 x 0.1).

6.3 Threats to WNP Humpback Whales

Currently, direct mortality from bycatch in commercial fisheries, injury and mortality from fishery entanglements, and ship strikes threaten individuals in the WNP population. In addition, the extent of impact to humpback whales from underwater noise and contaminants in the marine ecosystem is unknown. Although these human activities clearly have an adverse effect to individuals in the population, the population-level consequences of these anthropogenic stressors are not fully understood. Despite this, increasing population trends and protection from commercial whaling may mean that the probability of extinction has been reduced for this species since its ESA listing in 1973. NMFS recently announced the initiation of a humpback whale status review under the ESA, which is a periodic undertaking conducted to ensure that the listing classification of a species is accurate. (74 FR 40568, August 12, 2009).

6.3.1 Fishery Entanglements

Until 2004, there were six different federally-regulated commercial fisheries in Alaska that occurred within the range of the WNP humpback whale stock that were monitored for incidental mortality by fishery observers. As of 2004, changes in fishery definitions in the List of Fisheries have resulted in separating these six fisheries into 22 fisheries (69 FR 70094, 2 December 2004). This change does not represent a change in fishing effort, but provides managers with better information on the component of each fishery that is responsible for the incidental serious injury or mortality of marine mammal stocks in Alaska (Table 1).

Strandings of humpback whales entangled in gear of unobserved fisheries or with injuries caused by interactions with fishing gear are another source of mortality data. The only fishery-related humpback stranding in an area thought to be occupied by animals from this stock was reported by a U. S. Coast Guard vessel in late June 1997 operating near the Bering Strait. The whale was found floating dead entangled in netting and trailing orange buoys (National Marine Mammal Laboratory, Platforms of Opportunity Program, unpubl. data, 7600 Sand Point Way NE, Seattle, WA 98115). With the given data it is not possible to determine which fishery (or even which country) caused the mortality. Note, that this mortality has been attributed the WNP stock, but without a tissue sample (for genetic analysis) or a photograph (for matching to known Japanese animals) it is not possible to know for certain (i.e., it may have belonged to the CNP stock). Alaska natives reported harvesting a humpback whale that had stranded in a south Norton Sound lagoon in 2006 (see below). No other strandings or sightings of entangled humpback whales of this stock were reported between 2001 and 2008.

Observed Fisheries

Estimates of marine mammal serious injury/mortality in each of these observed fisheries are provided in Perez (2006) and Perez (unpubl. ms.). Between 2002 and 2006, there was one incidental serious injury and mortality of a WNP humpback whale in the Bering Sea/Aleutian Islands sablefish pot fishery (Table 3). Average annual mortality from observed fisheries was 0.20 humpbacks from this stock (Table 3). Note, that the stock identification is uncertain and the mortality may have involved a whale from the CNP stock of humpback whales. However, this mortality has been evaluated relative to its potential impact on the WNP stock, because the very low PBR of this stock may result in a greater impact on the population.

However, this estimate is considered a minimum for all commercial fisheries because there are no data concerning fishery-related mortalities in Japanese, Russian, or international waters. However, this negligible impact determination only considers incidental serious injury and mortality incidental to U. S. commercial fisheries. In addition, there is a small probability that fishery interactions discussed in the assessment for the CNP stock may have involved animals from this stock because of the overlap in with the CNP stock.

6.3.2 Non-fishery Vessel Interactions in Alaska

There are two reported ship strikes within the geographic area inhabited by WNP humpback whales in Alaska waters: both involved recreational vessels in the Kodiak area in 2008. In each case the presumably struck whale was subsequently observed exhibiting what appeared to be normal behavior without signs of visible injury. Accordingly, these two events are not considered to be serious injuries

6.3.4 Other Threats

Elevated levels of sound from the U. S. Navy's Low Frequency Active Sonar program and other anthropogenic sources (e.g., shipping, seismic profiling by air guns related to oil and gas exploration) is a potential concern for WNP humpback whales in the northern Aleutian Basin and Chukchi Sea.

Subsistence hunters in Alaska reported harvesting a humpback whale that had stranded in a south Norton Sound lagoon in 2006. Because this whale was stranded within a lagoon and there is no history of Alaska Native subsistence hunting of humpback whales, this event is classified as a stranding and not a subsistence take for purposes of calculating the annual rate of serious injury and mortality. There have not been any reported direct substance harvest takes of humpback whales from this stock by hunters in Alaska or Russia.

6.4. Interaction with Fisheries in Alaska

The available information on observed WNP humpback whale interaction with the U.S. commercial fisheries in Alaska has been limited to one possible instance of serious injury or mortality in the Bering Sea sablefish pot fishery in 2002 (Table 3). However, this event occurred in an area of overlap between the WNP and CNP humpback stocks. Because of the uncertainty of stock assignment of that take, NMFS evaluated the potential impacts of this mortality to each of the possible source stocks.

6.5 Negligible Impact Analysis

6.5.1 Incidental Mortality and Serious Injury in Commercial Fisheries

Individual incidental serious injuries and mortalities to the WNP stock of humpback whales caused by commercial fisheries in Alaska are summarized in Table 3. Only serious injuries and mortalities were used in making the negligible impact determination. Data for serious injury and mortality incidental to commercial fishing operations includes observer data, subsistence harvest, and stranded or entangled whales reported to NMFS through various sources.

Although some limited data are available for recent years, these data are considered preliminary and may not be consistent with earlier data; therefore, the time frame for the data used in this analysis is the five-year period from 2002 through 2006. The Guidelines for Assessing Marine Mammal Stocks (GAMMS), reported in Wade and Angliss (1997) and the subsequent 2005 GAMMS update provide guidance that, when available, "it is suggested that mortality estimates could be averaged over as many years necessary to achieve a CV of less than or equal to 0.3, but should usually not be averaged over a time period of more than the most recent 5 years for which data have been analyzed" (Wade and Angliss 1997). This time frame provides enough data to adequately, capture year to year variations in take levels, while better reflecting current environmental and fishing conditions as they may change over time. Preliminary NMFS observer data show that there were no observed takes in the2007 or 2008, but the WNP humpback whale SAR (Allen and Angliss 2010) uses the 2002 to 2006 data because the more recent data have not been analyzed.

Entanglement data are opportunistic data that are reported to NMFS from various sources, including the general public, authorized members of the NMFS' marine mammal stranding networks, commercial fishermen, NMFS Enforcement, the U.S. Coast Guard, and others. Verification of some reports is often difficult, due to a lack of detailed information accompanying the report (such as positive species identification, location, indication of human interaction, etc.), resulting in reports that range from confirmed to unconfirmed. NMFS Alaska Region has developed guidelines for use in determining the types of entanglement information that is considered sufficiently reliable to be used in assessments of the impacts of fisheries-related incidents on a marine mammal population. Serious injuries and mortalities that are included in the annual List of Fisheries may be included in the total serious injury/mortality across all U.S. fisheries where commercial fishing gear was seen attached to an animal or other specific indications of fishery interaction, but may not be attributable to a particular fishery. Only those serious injuries and mortalities in which the specific fishery can be positively identified are used in assessing the impacts of specific individual fisheries on marine mammal populations. Such fishery identification is made through identification of the associated gear type, gear registration number, or communication between NMFS staff, NMFS Enforcement, or the U.S. Coast Guard and the individual fishermen whose gear entangled the animal, or other compelling evidence.

Serious injuries were distinguished from non-serious injuries using results from a workshop addressing this issue (Angliss and DeMaster 1998). This estimate is considered a minimum because not all entangled animals die and not all dead animals are found, reported, or cause of death determined. A Serious Injury Workshop was held in 2007 to re-evaluate 1999 NMFS guidelines used to determine if fishery entanglements, ship strikes, or other human interactions with a marine mammal results in serious injury. Revised guidelines for determining serious injury are expected to be finalized in the near future.

Mortalities or serious injuries of WNP humpback whales sometimes occur in an area of known overlap with the CNP stock of humpback whales. Where there is considerable uncertainty regarding to which stock an individual serious injury or mortality should be assigned, NMFS exercises a conservative approach by considering the possible effects of such serious injuries and mortalities under separate scenarios for each possible source stock. In this analysis NMFS notes there is one humpback whale mortality event that occurred in the overlap area; there is no certainty as to what stock that whale belonged. The impact of that event is factored into independent analysis for each of the two overlapping stocks: the total serious injuries and mortalities from that stock (those within the overlap area plus those outside the overlap area, but within the range of that stock) are assessed against the PBR for that stock. This results in a maximum level of possible serious injuries or mortalities that may have been taken from each stock, based on known serious injury or mortality and, therefore, the maximum possible impact to the population from the known incidents. This assessment is completed for each of the stocks that occur in the overlap area. This approach does not cause any individual serious injury or mortality to be counted twice in assessing the impact of the serious injuries and mortalities, since the assessments for each stock are done independently and are not added together. Where information is available regarding the location of the take, genetics of the animal taken, or other information that would conclusively link mortality to a specific stock, NMFS uses that information to assign the take to a specific stock.

The total of all known serious injury and mortalities to the WNP stock as a result of commercial fishing operations for the time period from 2002 through 2006 is 1 whale, resulting in an annual average take of 0.20 animals (Table 3).

The current PBR for this stock is conservatively estimated at 2.0 animals. Therefore, the total annual average incidental take in commercial fisheries for this timeframe is equal to 10 percent of the PBR.

6.5.2 Other Human-Caused Injuries and Mortalities

Only one "subsistence take" has been reported (Allen and Angliss 2010) for the 2004-2008 period. However, because that whale had stranded prior to being harvested and live humpback whales are not a focus for subsistence hunters in Alaska, we calculate the average subsistence take as 0 animals.

6.5.3 Total Human-Caused Mortality and Serious Injury

An estimated annual total human-caused M/SI rate for the entire WNP stock of humpback whales in the US EEZ for the 2002-2006 time period is 0.2 (US commercial fishery-related). Accordingly, total human-caused M/SI is below the PBR (2.0) for this stock.

6.6 Application of Negligible Impact Determination Criteria

In applying the 1999 criteria (64 FR 28800, May 27, 1999; *see* page 8) to determine whether M/SI incidental to commercial fisheries will have a negligible impact on a stock, NID Criterion 1 is the starting point for analyses. If this criterion is satisfied, the analysis would be concluded. The remaining criteria describe alternatives applicable under certain conditions (such as fishery mortality below the negligible threshold but other human-caused mortality above the threshold, or fishery and other human caused mortality between the negligible threshold and PBR for a stock that is increasing or stable). If NID Criterion 1 is not satisfied, NMFS may use one of the other criteria as appropriate.

The NID Criterion 1 states: “The threshold for initial determination will remain at 0.1 PBR. If total human-related serious injuries and mortalities are less than 0.1 PBR, all fisheries may be permitted.” In this case, NID Criterion 1 was not satisfied because the total human-related serious injuries are equal to 0.1 PBR. The overall PBR calculated for this stock is 2.0 animals (Allen and Angliss 2010). The annual average serious injury and mortality to the WNP stock of humpback whales from all human-caused sources is 0.2 animal, which is 10% of this stock’s PBR [equal to the 0.1 PBR (2.0 animals) threshold]. As a result, the other criteria must be examined.

The NID Criterion 3 states: “If total fisheries-related serious injuries and mortalities are greater than 0.1 PBR and less than PBR and the population is stable or increasing, fisheries may be permitted subject to individual review and certainty of data. Although the PBR level has been set up as a conservative standard that will allow recovery of a stock, there are reasons for individually reviewing fisheries if serious injuries and mortalities are above the threshold level. First, increases in permitted serious injuries and mortalities should be carefully considered. Second, as serious injuries and mortalities approach the PBR level, uncertainties in elements such as population size, reproductive rates, and fisheries-related mortalities become more important.”

Only the M/SI incidental to commercial fishing is subject to the negligible impact determination; however, total human-caused M/SI of WNP humpback whales should be below PBR. Based on data for the 5 yr period (2002-2006) adopted for this analysis, the total of 0.2 potential M/SI per year is below the stock’s PBR of 2.0.

The guidance for use of Criteria 1 is a M/SI of *less than* 0.1; the guidance for use of Criteria 3 is M/SI of *greater than* 0.1 PBR. However, in this case the M/SI *is equal to* 0.1 PBR. By adopting Criteria 3 as the standard to apply, NMFS is taking a precautionary approach. NMFS also views this as precautionary because preliminary data for 2007 and 2008 report no additional fishery related mortalities or serious injuries to WNP humpback whales. Furthermore, the established analysis guidelines used by NMFS to assign fisheries to categories under the annual List of Fisheries (LOF) stipulates that where total serious injury and mortality across all fisheries is equal to or less than 10 percent of a stock’s PBR, all fisheries interacting with this stock would be placed in Category III. NMFS intends to propose a change to Category III for this fishery for the 2012 LOF, based on the current level of total serious injury and mortality from this stock (equal to 10 percent of the stock’s PBR) and the fact that this fishery has no takes from other marine mammal stocks that would place it in Category II. Because this fishery is currently in Category II it requires the subject permit to lawfully incidentally take ESA-listed species and is therefore subject to this NID.

Basin-wide survival rate data (Mizroch et al 2004; Calambokidis et al. 2008) as well as a variety of regional population estimates, including the Alaska region (Zerbini et al 2006) considered in Allen and Angliss (2010) provide concurring evidence the population is likely increasing at some uncertain rate, thus satisfying an additional standard appropriate to NID Criterion 3. Therefore, U.S. commercial fisheries within the range of WNP humpback whales may be permitted subject to their individual review and the certainty of relevant data, and provided that the other provisions of section 101(a)(5)(E) are met.

Although there are uncertainties in information regarding WNP humpback whales, such as abundance and mortality/serious injury estimates, the level of human-caused M/SI is well below the estimated PBR. Point estimates of abundance for the WNP (Asia) humpback whale ranged from 938 to 1107 with a minimum population estimate of 732 animals (Allen and Angliss 2010). Best available estimates of population growth range from 4.9% to near 6.7% (Zerbini et al. 2006, Calambokidis et al. 2008); the best estimate for R_{MAX} is 7% per year. Only one fishery has been implicated in a mortality/serious injury event potentially involving of a WNP humpback whale. That event occurred in 2002 and there have been no subsequent reported events in the years since. Fishery-related M/SI is only a small portion of the stock's PBR, which is calculated using the most conservative FR of 0.1 (with a long term-average M/SI equal to PBR, 90% of the stock's net annual production would be reserved for recovery). The Biological Opinion (NMFS 2010a) issued for the subject fisheries note that reported levels of entanglements and incidental take are not expected to increase as a result of the proposed action and are not expected to have an adverse consequence on the viability of the subpopulations or foraging groups of humpback whales in the action area. Therefore, these events would not cause an increase to human-caused M/SI to exceeding or even approaching the stock's PBR.

The NID Criterion 3 is therefore satisfied in determining that mortality and serious injuries of the WNP humpback stock incidental to commercial fishing will have a negligible impact on the stock. This determination is supported by review of M/SI incidental to U.S. commercial fishing, increased growth rate of the stock, limited potential for increases in serious injury and mortality due to the relevant fisheries, and the fact that total human-caused M/SI is below the estimated PBR.

6.7 Negligible Impact Determination

Based on the review of the best available scientific and commercial data and the applicability of the criteria for making a negligible impact determination under MMPA Section 101(a)(5)(E), all conditions of NID Criterion 3 (64 FR 28800, May 27, 1999) are met by the available serious injury and mortality data for the WNP stock of humpback whales. NMFS has determined that the annual M/SI incidental to commercial fisheries Alaska (0.2), with a US EEZ total annual M/SI of 0.2 animals, will have a negligible impact for purposes of issuing a permit under section 101(a)(5)(E) of the MMPA, because this level is below PBR for this endangered stock (using 0.1 as the FR in the PBR calculation). Accordingly, the expected level of M/SI incidental to commercial fisheries will not cause more than a 10% increase in the time to recovery for WNP humpback whales. NMFS will re-evaluate this determination as new information becomes available.

7.0 Steller sea lion, Western U.S. stock

7.1 Species Information

For this assessment, NMFS considered the impact of serious injury and mortality to the Western U.S. stock of Steller sea lions (Western Steller sea lion) resulting from interactions with the above described fisheries. Steller sea lions were first provided with protection under the Endangered Species Act in 1990 when the NMFS issued an emergency interim rule to list the species as threatened throughout its range (55FR1264, April 5, 1990). Critical habitat was designated on August 27, 1993 (58 FR 45269) based on the location of terrestrial rookery and haulout sites, spatial extent of foraging trips, and availability of prey. In 1997, based on demographic and genetic dissimilarities, NMFS designated two distinct population segments (DPS) of Steller sea lions under the ESA: a Western DPS and an Eastern DPS (62 FR 24345, 62 FR 30772). Due to persistent decline, the Western DPS was reclassified as endangered, while the increasing Eastern DPS remained classified as threatened. The first recovery plan for Steller sea lions was completed in December 1992 and covered the entire range of the species. A Revised Final Recovery Plan for the Eastern and Western DPSs was completed (73FR11872, March 5, 2008; http://www.nmfs.noaa.gov/pr/recovery/plans.htm). As a result of the ESA endangered listing, the Western U.S. stock of the Steller sea lion (stock identity is the same as the Western DPS identified under the ESA) is by definition classified as a strategic stock under the MMPA. The time frame for the data used in this analysis is the five-year period from 2002 through 2006, where these data are available. More recent data have been incorporated into the analysis where available and when considered final; in some areas recent preliminary data is presented for comparative purposes but was not used in the final assessment.

Distribution and stock structure:
Steller sea lions range along the North Pacific Rim from northern Japan to California (Loughlin et al. 1984), with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands, respectively. The species is not known to migrate, but individuals disperse widely outside of the breeding season (late May-early July), thus potentially intermixing with animals from other areas. Despite the wide-ranging movements of juveniles and adult males in particular, exchange between rookeries by breeding adult females and males (other than between adjoining rookeries) appears low (NMFS 1995).

Based on reviews of distribution, population dynamics, phenotype, and genetic information, two separate stocks of Steller sea lions were recognized within U. S. waters: an Eastern U. S. stock, which includes animals east of Cape Suckling, Alaska (at 144°W), and a Western U. S. stock, which includes animals at and west of Cape Suckling (NMFS 2008, Allen and Angliss 2010).

Steller sea lions that breed in Asia have been considered part of the Western U.S. stock. While Steller sea lions seasonally inhabit coastal waters of Japan in the winter, breeding rookeries are currently only located in Russia (Burkanov and Loughlin, 2005). Juveniles marked in the central Aleutian Islands have been observed in the Commander Islands and animals tagged in the Commander Islands have been observed on rookeries and haulouts in the Aleutian Islands of Alaska.

Movement across the western and Eastern U.S. stock boundary by animals (particularly juveniles) from both populations does occur (Raum-Suryan *et al.* 2002). Moreover, Steller sea lions may sometimes disperse from their rookeries of birth and breed at other rookeries within their parent populations. This breeding dispersal has the potential to affect local population dynamics and patterns of underlying genetic variation. Movement of animals has also indicated that the geographic boundary between the western and eastern populations as it existed at the time of the listing of two DPSs may be changing or blurring at the edges (Gelatt *et al*. 2006; Pitcher *et al.* 2007; NMFS unpublished).

The consequence is that the impact of actions (e.g., incidental catch or serious mortality in a fishery, entanglement, or other action) occurring within the breeding range of one stock may affect animals that are utilizing habitat, especially for feeding, within the breeding range of the other population stock.

7.2 Status of the Stock

Population size

The most recent comprehensive estimate (pups and non-pups) of abundance of the Western U.S. stock of Steller sea lions in Alaska is based on aerial surveys of non-pups in June-July 2008 (Fritz et al. 2008a) and aerial and ground-based pup counts in June and July of 2005 through 2009 (Fritz et al. 2009). Data from these surveys represent actual counts of pups and non-pups at all rookeries and major haulout sites. During the 2008 aerial survey, a total of 31,246 non-pups was counted at 275 rookeries and haulout sites; 6,522 in the Gulf of Alaska and 14,724 in the Bering Sea/Aleutian Islands (Fritz et al. 2008b). A composite pup count for 2005-2009 includes counts from 2 sites in 2005, and 3 sites in 2008, and 172 sites in 2009. There were 5,456 pups counted in the Gulf of Alaska and 664 pups counted in the Bering Sea/Aleutian Islands for a total of 11,120 for the stock in Alaska. Combining the pup count data from 2005-2009 (11,120) and non-pup count data from 2008 (31,246) results in a minimum abundance estimate of 42,366 Steller sea lions for the Western U.S. stock in 2005-2009 (Allen and Angliss 2010). This is considered a minimum estimate because it has not been corrected to account for animals that were at sea during the surveys.

In 2007 and 2008, over 19,000 Western Steller sea lions were counted in Russia. Methods used to survey Steller sea lions in Russia differ from those used in Alaska, with less use of aerial photography and more use of skiff surveys and ground counts. Burkanov and Loughlin (2005) estimated that the size of the population (pups and non-pups) in Russia was 16,000 in 2005.

Current Population Trend

The first reported trend counts (an index to examine population trends) of Steller sea lions in Alaska were made in 1956-60. Those counts indicated that there were at least 140,000 (no correction factors applied) sea lions in the Gulf of Alaska and Aleutian Islands (Merrick et al. 1987). Subsequent surveys indicated a major population decrease, first detected in the eastern Aleutian Islands in the mid-1970s (Braham et al. 1980). Counts from 1976 to 1979 indicated about 110,000 sea lions (Table 4). The decline appears to have spread eastward to the Kodiak Island area during the late 1970s and early 1980s, and then westward to the central and western Aleutian Islands during the early and mid-1980s (Merrick et al. 1987, Byrd 1989).

Between 1990 and 2000, trend site counts continued to decline, though more slowly than in the 1980s, resulting in a total reduction of almost 90% since the 1950s and 83% since the 1970s; the population likely reaching its smallest size in 2000. Sub-area declines from 1990 to 2000 had a different pattern than in the 1970s-1990 period, with smaller changes in the center of the Alaskan range (western Gulf of Alaska (GOA) and eastern and central Aleutians: -32% to +1%) and larger declines at the edges (eastern and central GOA and western Aleutians: -54% to –64%)

(NMFS 2010a). The average rate of decline between 1990 and 2000 for all trend sites in the Western U.S. stock was 5.1% per year (Sease *et al.* 2001).

Counts of non-pup Steller sea lions at trend sites for the Western U.S. stock increased 5.5% from 2000 to 2002, and at a similar rate between 2002 and 2004 (Table 4, Figure 2). These were the first region-wide increases for the Western U.S. stock since standardized surveys began in the 1970s.

More recent data (2004-2008) show considerable regional variability in trend (percentages listed below are % change between years):

- the population in the eastern Aleutian Islands is the only one that has consistently increased from 2004-2008 (+7%);
- the populations in the central and western Aleutian Islands declined (-30% and -16%, respectively);
- the populations in the central and western Gulf of Alaska increased between 2004 and 2007, but declined slightly between 2007 and 2008;
- the non-pup counts in the eastern Gulf of Alaska increased by 35%, with some of this increase likely related to timing of the 2008 survey (earlier than usual) and seasonal movement of animals into this area from the central Gulf and Southeast Alaska (Eastern U.S. stock) (Fritz et al. 2008, DeMaster 2009, Allen and Angliss 2010).

Overall between 2000 and 2008, counts of adult and juvenile Western Steller sea lions at all trend sites within the range of the Western U.S. stock in Alaska increased 12% and most of this increase occurred in the first four years (11% increase between 2000 and 2004). In the core of the Western U.S. stock range in Alaska (Kenai-Kiska), all of the 2000-2008 increase of 10% occurred between 2000 and 2004. In the larger Kenai-Attu region, counts increased 7% in the first four years, but then dropped slightly between 2004 and 2008. Consequently, the overall increase of 3% observed between 2004 and 2008 in the Western U.S. stock was due entirely to a 35% higher count in the eastern Gulf of Alaska.

- Non-pup counts in the following regions increased between 2000 and 2008: eastern AI, western GOA, and eastern GOA.
- Non-pup counts in the following regions decreased between 2000 and 2008: western AI, central AI, and the central GOA .

Analysis of the differences in timing and counts between the 2008 and 2009 non-pup surveys concluded that approximately 570 animals from the Eastern U.S. stock may have been counted within the range of the Western U.S. stock in 2008 (DeMaster 2009). If the 570 non-pups are subtracted from the 2008 total, then the overall Western U.S. stock increase between 2004 and 2008 is reduced from 3% to 1%. The 2009 non-pup survey results in the northern Gulf of Alaska supports a conclusion that the increase observed between 2000 and 2004 in the size of the Western U.S. stock of Steller sea lion did not continue, and that the population was generally stable between 2004 and 2008 (Allen and Angliss 2010). A reasonable interpretation is that overall, the Western U.S. stock of Steller sea lions is increasing at a non-significant rate of 1.4% (Ianelli 2010, Johnson 2010, DeMaster, pers. comm., NPFMC briefing August 16, 2010).

Potential Biological Removal
Under the 1994 reauthorized MMPA, PBR is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a FR: PBR = N_{MIN} x 0.5 R_{MAX} x FR. The FR for this stock is 0.1, the default value for stocks listed as "endangered" under the Endangered Species Act (Wade and Angliss 1997). Thus, for the U.S. portion of the Western U.S. stock of Steller sea lions, PBR = 254 animals (42,366 x 0.06 x 0.1).

7.3 Threats to the Western U.S. Stock of Steller Lions

7.3.1 Illegal shooting

Illegal shooting of sea lions was thought to be a potentially significant source of mortality prior to the listing of sea lions as "threatened" under the U.S. Endangered Species Act (ESA) in 1990. Such shooting has been illegal since the species was listed as threatened. (Note: the 1994 Amendments to the MMPA made intentional lethal take of any marine mammal illegal except for subsistence take by Alaska Natives or where imminently necessary to protect human life). Records from NMFS enforcement indicate that there were two cases of illegal shootings of Steller sea lions in the Kodiak area in 1998, both of which were successfully prosecuted (NMFS, Alaska Enforcement Division). There have been no cases of successfully prosecuted illegal shootings between 1999 and 2003 (NMFS, Alaska Enforcement Division).

7.3.2 Subsistence harvest

Information on the subsistence harvest of Western U.S. stock Steller sea lions comes via two sources: the Alaska Department of Fish and Game (ADFG) and the Ecosystem Conservation Office (ECO) of the Aleut Community of St. Paul. The ADFG conducts systematic interviews with hunters and users of marine mammals in approximately 2,100 households in about 60 coastal communities within the range of the Steller sea lion in Alaska (Wolfe et al. 2004). The interviews are conducted once per year in the winter (January to March), and cover hunter activities for the previous calendar year. The ECO collects data on the harvest in near real-time on St. Paul Island, and records hunter activities within 36 hours of the harvest (Zavadil et al. 2004). Information on subsistence harvest levels is provided in Table 6; data from ECO (e.g., Zavadil et al. 2004) are relied upon as the source of data for St. Paul Island and all other data are from the ADFG (e.g., Wolfe et al. 2004).

The mean annual subsistence take from this stock over the 5-year period from 2004 through 2008 was 197 Steller sea lions/year (Table 6).

7.3.3 Authorized Mortality in Research

Mortalities may occasionally occur incidental to marine mammal research activities authorized under MMPA permits issued to a variety of government, academic, and other research organizations. Between 2003-2007, there were a total of 3 mortalities resulting from research on the Western U.S. stock of Steller sea lions, which results in an average of 0.6 mortalities per year from this stock (Tammy Adams, Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, 1315 East-West Highway, Silver Spring, MD 20910).

7.3.4 Habitat concerns

The persistent decline in the Western population stock of Steller sea lions caused a change in the listing status of the stock in 1997 from “threatened” to “endangered” under the U.S. Endangered Species Act of 1973. Survey data collected since 2000 suggest that the decline has slowed or stopped in some portions of the range of the Western U. S. stock, but continues in others. Many factors have been suggested as causes of the steep decline observed in the 1980s, (e.g., competitive effects of fishing, environmental change, disease, killer whale predation, incidental take, illegal and legal shooting). Decreases in rates of survival, particularly for juveniles, were associated with the steep 1980s declines (Holmes et al. 2007). Factors causing direct mortality were likely the most important. The slowing of the decline in the 1990s, and the periods of increase and stability observed between 2000 and 2008 were associated with increases in survival of both adults and juveniles, but also with continuation of a chronic decline in reproductive rate that may have been initiated in the early 1980s (Pitcher et al. 1998, Holmes et al. 2007). Nutritional stress related to competition with commercial fisheries or environmental change and predation by killer whales, have been identified as potentially important threats to recovery (NMFS 2008). Additional potential threats to Steller sea lion recovery are discussed in the Recovery Plan (NMFS 2008), the 2010 BiOp (NMFS 2010a) and Allen and Angliss (2010).

7.4 Incidental Mortality and Serious Injury in Commercial Fisheries

7.4.1 Direct Impacts of Fisheries in Russia

Fisheries occur in Russian waters that similar to those in the US known to incidentally kill or seriously injure Steller sea lions (i.e., Bering Sea/Aleutian Islands herring and pollock trawl fisheries). Burkanov et al. (2006) estimated between 43-50 Western Steller sea lions may have been subjected to serious injury or mortality in the 2002 western Bering Sea herring trawl fishery. However, no additional information is available at this time to assess if Western U.S. stock Steller sea lions might be taken or at what frequency incidental to other fisheries in Russian waters.

7.3.2 Direct Impacts of Commercial Fisheries in Alaska

Until 2003, there were six different federally regulated commercial fisheries in Alaska that could have interacted with Steller sea lions. These fisheries were monitored for incidental mortality by fishery observers. As of 2003, changes in fishery definitions in the List of Fisheries have resulted in separating these 6 fisheries into 22 fisheries (69 FR 70094, 2 December 2004). This change does not represent a change in fishing effort, but provides managers with better information on the component of each fishery that is responsible for the incidental serious injury or mortality of marine mammal stocks in Alaska. Currently there are no Category I fisheries in the subject area reviewed by this document. The following are currently classified as Category II fisheries and are known to take Western U.S. stock Steller sea lions: Bering Sea/Aleutian Islands flatfish trawl, Bering Sea/Aleutian Islands pollock trawl, and Bering Sea/Aleutian Islands Pacific cod longline (Table 1).

Data from Fisheries Observer Programs

Estimates of marine mammal serious injury/mortality in each of these observed fisheries are provided in Perez (2006) and Perez (unpubl. ms.) and summarized in Table 5. Between 2002-2006, there were incidental M/SI of Western U.S. stock Steller sea lions in the following fisheries: Bering Sea/Aleutian Islands Atka mackerel trawl, Bering Sea/Aleutian Islands flatfish trawl, Bering Sea/Aleutian Islands Pacific cod trawl, Bering Sea/Aleutian Islands pollock trawl, Gulf of Alaska Pacific cod trawl, Gulf of Alaska pollock trawl, and Bering Sea/Aleutian Islands Pacific cod longline (Table 5).

Eight gillnet fisheries and two purse seine fisheries for salmon managed by the State of Alaska are classified as Category II fisheries (Table 1). Of these, six have reported incidental kill/injury of Western U.S. stock Steller sea lions (Tables 1 and 5).

Combining the mortality estimates from the Bering Sea and Gulf of Alaska groundfish trawl and Gulf of Alaska longline fisheries (11.3) with the mortality estimate from the Prince William Sound salmon drift gillnet fishery (14.5) results in an estimated mean annual mortality rate in the observed fisheries of 25.8 (CV = 0.60) sea lions per year from this stock (Table 5).

Data from Stranding Databases

Reports from the NMFS stranding database of Steller sea lions entangled in fishing gear or with injuries caused by interactions with gear are another source of mortality data. During the 5-year period from 2001 to 2005, there was only one confirmed fishery-related Steller sea lion stranding in the range of the Western U.S. stock. In addition to this incident, a Steller sea lion was entangled in a large flasher/spoon in 1998. It is likely that this injury occurred as a result of a sport fishery, not a commercial fishery (Table 5). Fishery-related strandings during 2001-2005 result in an estimated annual mortality of 0.4 animals from this stock. This estimate is considered a minimum because not all entangled animals strand and not all stranded animals are found or reported. Steller sea lions reported in the stranding database as shot are not included in this estimate, as they may result from animals struck and lost in the Alaska Native subsistence harvest.

The minimum estimated mortality rate incidental to U. S. commercial fisheries is 26.2 sea lions per year, based on observer data (25.8) and stranding data (0.4) where observer data were not available. Observer data on state fisheries dates as far back as 1990; however, these are the best data available to estimate takes in these fisheries. No observers have been assigned to several fisheries that are known to interact with this stock making the estimated mortality a minimum estimate.

7.5 Negligible Impact Analysis

7.5.1 Incidental Take and Serious Injury in Commercial Fisheries

Individual incidental serious injuries and mortalities to the Western U.S. stock of Steller sea lions caused by commercial fisheries in Alaska are summarized in Table 5. Only serious injuries and mortalities were used in making the negligible impact determination.

Although some limited data are available mortality estimates in commercial fisheries for 2007-2008, these data are considered preliminary and may not be consistent with earlier data; therefore, the time frame for these data used here is the five-year period from 2002 through 2006. Mortality due to subsistence harvest by Alaska Natives is available from 2004-2008. The GAMMS and the subsequent 2005 GAMMS update provide guidance that, when available, "it is suggested that mortality estimates could be averaged over as many years necessary to achieve a CV of less than or equal to 0.3, but should usually not be averaged over a time period of more than the most recent 5 years for which data have been analyzed" (Wade and Angliss 1997). This time frame provides enough data to adequately, capture year to year variations in take levels, while better reflecting current environmental and fishing conditions as they may change over time.

Data for serious injury and mortality incidental to commercial fishing operations includes observer data, subsistence harvest, and stranded or entangled Steller sea lions reported to NMFS through various sources. Stranding data are opportunistic data that are reported to NMFS from various sources, including the general public, authorized members of the NMFS' marine mammal stranding networks, commercial fishermen, NMFS Enforcement, the U.S. Coast Guard, and others. Verification of some reports is often difficult, due to a lack of detailed information accompanying the report (such as positive species identification, location, indication of human interaction, etc.), resulting in reports that range from confirmed to unconfirmed. NMFS Alaska Region has developed guidelines for use in determining the types of stranding information that is considered sufficiently reliable to be used in assessments of the impacts of fisheries-related incidents on a marine mammal population. Serious injuries and mortalities that are included in the annual List of Fisheries may be included in the total serious injury/mortality across all U.S. fisheries where commercial fishing gear was seen attached to an animal or other specific indications of fishery interaction, but may not be attributable to a particular fishery. Only those serious injuries and mortalities in which the specific fishery can be positively identified are used in assessing the impacts of specific individual fisheries on marine mammal populations. Such fishery identification is made through identification of the associated gear type, gear registration number, or communication between NMFS staff, NMFS Enforcement, or the U.S. Coast Guard and the individual fishermen whose gear entangled the animal, or other compelling evidence.

Serious injuries were distinguished from non-serious injuries using results of a workshop addressing the issue (Angliss and DeMaster 1998). This estimate is considered a minimum because not all entangled animals die and not all dead animals are found, reported, or cause of death determined. A Serious Injury Workshop was held in 2007 to re-evaluate 1999 NMFS guidelines used to determine if fishery entanglements, ship strikes, or other human interactions with a marine mammal results in serious injury. Revised guidelines for determining serious injury are expected to be finalized in the near future.

The average minimum estimated total of all known serious injury and mortalities to Western U.S. stock Steller sea lions as a result of commercial fishing operations for the time period from 2002 through 2006 is 26.2 (25.8 from Observer Program + 0.4 from stranding data).

The current PBR for this stock is conservatively calculated at 254 animals (Allen and Angliss 2010). Therefore, the total annual average incidental take in commercial fisheries (26.2) in the US EEZ for the 2002-2006 (5yr) timeframe is > 10% of the PBR (25.4).

7.5.2 Other Human-Caused Injuries and Mortalities

The mean annual subsistence take from the Western U.S. stock of Steller sea lions over the 5-year period from 2004 through 2008 is 197 animals/year (77.6% of PBR).

The mean annual number of injury and mortality from research activities to Western U.S. stock Steller sea lions of the 5-year period from 2003-2007 is 0.6 mortalities per year (0.2% of PBR).

7.5.3 Total Human-Caused Mortality and Serious Injury

Based on available data, the estimated Total Human-Caused Mortality and Serious Injury (26.2 + 197 + 0.6 = 223.8) is less than the PBR (254) for this stock.

7.6 Application of Negligible Impact Determination Criteria

In applying the 1999 criteria (64 FR 28800, May 27, 1999) to determine whether M/SI incidental to commercial fisheries will have a negligible impact on a stock, NID Criterion 1 is the starting point for analyses. If this criterion is satisfied, the analysis would be concluded. The remaining criteria describe alternatives applicable under certain conditions (such as fishery mortality below the negligible threshold but other human-caused mortality above the threshold, or fishery and other human caused mortality between the negligible threshold and PBR for a stock that is increasing or stable). If NID Criterion 1 is not satisfied, NMFS may use one of the other criteria as appropriate.

NID Criterion 1 states: "The threshold for initial determination will remain at 0.1 PBR. If total human-related serious injuries and mortalities are less than 0.1 PBR, all fisheries may be permitted." In this case, NID Criterion 1 was not satisfied because the total human-related serious injuries are greater than 0.1 PBR. The overall PBR calculated for this stock is 254 animals (Allen and Angliss 2010). The annual average serious injury and mortality to Western U.S. stock Steller sea lions from all human-caused sources is 223.8 animals, which is 88.1% of this stock's PBR [254]. As a result, the other criteria must be examined.

Only the M/SI incidental to commercial fishing is subject to the negligible impact determination; however, total human-caused M/SI of Western U.S. stock of Steller sea lions should be below PBR. The total of 223.8 average annual M/SI per year is below the stock's PBR of 254.

Because the Western U.S. stock of Steller sea lions is believed to be stable or increasing (Allen and Angliss 2010; NMFS 2010a), NID Criterion 3 is the appropriate criterion. The total annual fisheries-related serious injury and mortality is 26.2 animals, which greater than 0.1 of PBR (25.4 animals) and less than this stock's PBR (254 animals). Therefore, U.S. commercial fisheries within the range of the Western U.S. stock of Steller sea lions may be permitted subject to their individual review and the certainty of relevant data, and provided that the other provisions of section 101(a)(5)(E) are met.

The NID Criterion 3 states: "If total fisheries-related serious injuries and mortalities are greater than 0.1 PBR and less than PBR and the population is stable or increasing, fisheries may be permitted subject to individual review and certainty of data. Although the PBR level has been set up as a conservative standard that will allow recovery of a stock, there are reasons for individually reviewing fisheries if serious injuries and mortalities are above the threshold level. First, increases in permitted serious injuries and mortalities should be carefully considered. Second, as serious injuries and mortalities approach the PBR level, uncertainties in elements such as population size, reproductive rates, and fisheries-related mortalities become more important."

The endangered Western U.S. stock of Steller sea lions has declined by almost 90% throughout its range, reaching its smallest size in 2000. Prior to the 1990s, the primary causes of the decline may have been commercial harvests of Steller sea lions, entanglement of juvenile Steller sea lions in commercial fishing gear, and intentional shooting by fishermen. Improvements in juvenile survival rates may be attributed to management actions taken in the 1990s to reduce direct mortality factors (e.g., shooting and incidental mortality in fisheries) and improvements in prey access resulting from fishery management measures implemented in the early 2000s. At present in the scientific community, there is no clear leading hypothesis to explain the decline of the Western U.S. stock of Steller sea lions in the 1990s (DeMaster *et al.* 2001) nor its apparent overall stability since 2000 (NMFS 2008, 2010). Indirect effects of commercial fishing, nutritional stress, predation, and natural environmental changes are all considered to be factors in the decline and lack of recovery (NMFS 2008). Recent analyses (Ianelli 2010, Johnson 2010) have projected that between 2000-2008 the Western Steller sea lion population is thought to have increased at about a 1.5% (non-significant) rate (DeMaster, pers. comm., NPFMC briefing August 16, 2010; Johnson 2010, Ianelli 2010). This information likely indicates that the Western U.S. stock of Steller sea lions is currently stable or increasing at a statistically insignificant rate (increasing in some sub-regions, but in two sub-regions is continuing to decline).

Fishery-related M/SI is 10.3% of the stock's PBR, which is calculated using a FR of 0.1 (with a long term-average M/SI equal to PBR, 90% of the stock's net annual production would be reserved for recovery). Thus, even with the current levels of human-caused M/SI, NMFS estimates the population is stable or increasing slightly.

Three fisheries have been identified in which the M/SI (MSI) exceeds 1% of the PBR set for the Western U.S. stock of Steller sea lions: the Bering Sea/Aleutian Islands flatfish trawl (3.01 animals/yr or 1.2% PBR), the Bering Sea/Aleutian Islands pollock trawl (3.83 animals/yr or 1.5%), and the Prince William Sound salmon drift gillnet fishery (14.5 animals/yr or 5.7%). Both the flatfish and pollock fisheries are currently subject to active NMFS based fisheries observer programs. Over the years of monitoring, the estimated mortality in these fisheries has fluctuated at low levels unlikely to have a significant adverse affect on survival or recovery. As these monitoring programs are expected to continue into the foreseeable future, it is reasonable to expect that any significant increase in M/SI of Steller sea lions in these fisheries would result in additional agency analysis and the rapid development of appropriate corrective management measures to reduce M/SI.

Calculation of the estimated mortality or serious injury for Western Steller sea lions in the Prince William Sound salmon drift gillnet fishery is based on data collected between 1990-1991; while dated, these are the best data available to estimate takes in this fishery. The fishery is not currently subject to monitoring for M/SI, nor are funds available to implement such a program.

The endangered Western Stock of Steller sea lions is continuing to decline in the three westernmost NMFS Statistical Regions (541-543) of its range. Following the guidance for making a criterion 3 NID, particular attention should be paid to future instances of incidental take of Western stock of Steller sea lions in those sub-regions to ensure the level of taking remains negligible on a local scale.

The BiOp issued for the subject fisheries also noted that reported levels of entanglements and incidental take and serious injury are not expected to increase as a result of the proposed action and are not expected to have an adverse consequence on the viability of the Western U.S. stock of Steller sea lions in the action area (NMFS 2010a). Therefore, these events would not cause human-caused M/SI to exceed the PBR. Accordingly, Criterion 3 is satisfied in determining that mortality and serious injuries of Western U.S. stock Steller sea lions incidental to commercial fishing would have a negligible impact on the stock because population growth is stable or increasing slightly, there are minor fluctuations in the number of serious injury and mortality due to the relevant fisheries, and the level of human-caused M/SI is below the estimated PBR.

7.7 Negligible Impact Determination

The NMFS recognizes there are uncertainties in information regarding the Western U.S. Steller sea lion stock. However, our review of the best available data indicates that despite continued declines, primarily in the western portion of the range, the stock is likely increasing overall by 1.4%/yr. Data available for estimating human caused M/SI in commercial fisheries are largely based on extensive and ongoing fisheries observer programs designed to address those fisheries known or believed most likely to interact with this stock. In some cases M/SI data are based on voluntary, verbal, or opportunistic reports (e.g. strandings, subsistence harvest) and, while this information is understood to be uncertain, there is an absence of contradictory data suggesting it is not an accurate estimate of current levels of mortality. Our review of the best available data indicates the estimated level of total human-caused M/SI is below the calculated PBR, the current level of M/SI in commercial fisheries is 10.3% of PBR, there is no expectation these levels of M/SI will increase in the future, and the stock is likely increasing overall, even given the current levels of M/SI.

Based on the review of the best available scientific and commercial data and the applicability of the criteria for making a negligible impact determination under MMPA Section 101(a)(5)(E), all conditions of criterion 3 (64 FR 28800, May 27, 1999) are met by the available serious injury and mortality data for the Western U.S. stock of Steller sea lions. NMFS has determined that the annual M/SI incidental to commercial fisheries Alaska (26.2), with a US EEZ total annual M/SI of 223.8 animals, will have a negligible impact for purposes of issuing a permit under section 101(a)(5)(E) of the MMPA because this level is below PBR for this endangered stock. Accordingly, then, the expected level of M/SI incidental to commercial fisheries will not cause more than a 10% increase in the time to recovery for the Western U.S. stock of Steller sea lions. NMFS will monitor any incidental take (in particular, for areas 541-543) and will re-evaluate this determination as new information becomes available.

8.0 Steller sea lion, Eastern U.S. stock

8.1 Species Information[6]

For this assessment, NMFS considered the impact of serious injury and mortality to the Steller sea lion, Eastern U.S. stock, resulting from interactions with the above described fisheries (Table 1). Steller sea lions were first provided with protection under the Endangered Species Act in 1990 when the NMFS issued an emergency interim rule to list the species as threatened throughout its range (55FR1264, April 5, 1990). Critical habitat was designated on August 27, 1993 (58 FR 45269) based on the location of terrestrial rookery and haulout sites, spatial extent of foraging trips, and availability of prey. In 1997, based on demographic and genetic dissimilarities, NMFS designated two DPSs of Steller sea lions under the ESA: a Western DPS and an Eastern DPS (62 FR 24345, 62 FR 30772). Due to persistent decline, the Western DPS was reclassified as endangered, while the increasing Eastern DPS remained classified as threatened. The identity of the Eastern U.S. stock of Steller sea lions is identical to the Eastern DPS described under the ESA. The Eastern DPS, extending from Cape Suckling east British Columbia and south to California, remained on the list as threatened because of concern over Western DPS animals ranging into the east, the larger decline overall in the U.S. population, human interactions, and the lack of recovery in California (62 FR 24354). However, at present, the Eastern DPS appears to have met the recovery criteria laid out in the Final Revised Steller Sea Lion Recovery Plan (NMFS 2008; http://www.nmfs.noaa.gov/pr/recovery/plans.htm).

As a result of the ESA endangered listing, the Eastern DPS is by definition classified as a depleted stock under the MMPA. The time frame for the data used in this analysis is the five-year period from 2001 through 2005, although more recent data (to 2008) are included where available and when considered final. In some areas recent preliminary data are presented for comparative purposes but were not used in the final assessment.

Distribution and stock structure:

Based on reviews of distribution, population dynamics, phenotype, and genetic information, two separate stocks of Steller sea lions are recognized within U. S. waters: an Eastern U. S. stock, which includes animals east of Cape Suckling, Alaska (at 144°W), and a Western U. S. stock, which includes animals at and west of Cape Suckling (NMFS 2008, Allen and Angliss 2010).

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[6] This section is based primarily on Allen and Angliss (2010) with additional material included from the Groundfish BiOp (NMFS 2010).

The range of the Eastern U.S. stock of Steller sea lions extends around the North Pacific Ocean rim roughly from Prince William Sound, along Alaska's southern coast, and south to California (Kenyon and Rice 1961, Loughlin *et al*. 1984, 1992). The Eastern U.S. stock of Steller sea lions breeds on rookeries from California (currently, Año Nuevo Island off central California is the southernmost rookery, although until 1981 some pups were born farther south at San Miguel Island) to as far north as Southeast Alaska.

8.2 Status of the Stock

Population Size

Counts of pups on rookeries located in southeast Alaska, British Columbia, Oregon, and California (there are no rookeries located in Washington) conducted near the end of the birthing season are nearly complete counts of pup production. Calkins and Pitcher (1982) and Pitcher el al. (2007) concluded that the total Steller sea lion population could be estimated by multiplying pup counts by a factor based on the birth rate, sex and age structure, and growth rate of the Steller sea lion population. Using the most recent 2006-2009 pup counts available by region from aerial surveys across the range of the Eastern U.S. stock (total N=13,889), the total population of the Eastern U.S. stock of Steller sea lions is estimated to be within the range of 58,334 to 72,223. The minimum population estimate of 52,847 was calculated by adding the most recent non-pup and pup counts from all sites surveyed (Table 7) and includes counts as old as 2001 for sea lions hauled out in WA to as recent as 2009 for sites in SE Alaska and California, and all rookeries in Oregon. Additional details about these estimates are discussed in Allen and Angliss (2010).

Current Population Trend

Counts in Oregon have shown a gradual increase since 1976, as the adult and juvenile state-wide count for that year was 1,486 compared to 4,169 in 2002 (NMFS 2008).

Steller sea lion numbers in California, especially in southern and central California, have declined from historic numbers. Counts in California between 1927 and 1947 ranged between 4,000 and 6,000 non-pups with no apparent trend, but have subsequently declined by over 50%, and were between 1,500 and 2,000 non-pups during 1980-2004. At Año Nuevo Island off central California, a steady decline in ground counts started around 1970, and there was an 85% reduction in the breeding population by 1987 (LeBoeuf et al. 1991). Overall, counts of non-pups at trend sites in California and Oregon have been relatively stable or increasing slowly since the 1980s (Table 8, see also Figure 3).

In Southeast Alaska, counts of non-pups at trend sites increased by 56% from 1979 to 2002 from 6,376 to 9,951 (Merrick et al. 1992; Sease et al. 2001; NMFS 2008). NMFS conducted an aerial survey of Southeast Alaska in early June 2008 and counted only 8,748 non-pups on trend sites (Fritz et al. 2008). It is thought that the lower than expected count in Southeast Alaska may have been due to movement of animals early in the survey period (early June to early July) north to the Prince William Sound region (since counts of non-pups there were over 1,300 greater in 2008 than 2007) or south to British Columbia. This hypothesis was supported by counts from a late June 2009 non-pup survey in SE Alaska, in which 11,965 non-pups were observed on trend sites, over 3,200 more than were counted in early June 2008. Between 1979 and 2009, counts of pups on the three largest rookeries in Southeast Alaska (Forrester Island complex, Hazy Island and White Sisters) more than tripled (from 2,219 to 6,859). In British Columbia, counts of non-pups throughout the province increased at a rate of 3.9% annually from 1971 through 2006 (Olesiuk and Trites 2003). Counts of non-pups at trend sites throughout the range of the Eastern U.S. stock of Steller sea lions are shown in Figure 3. Between the 1970s and 2002, the average annual population growth rate of Eastern Steller sea lions was 3.1% (Pitcher et al. 2007).

Potential Biological Removal
Under the 1994 reauthorized MMPA, the PBR is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: $PBR = N_{MIN} \times 0.5R_{MAX} \times FR$. The default FR for stocks listed as "threatened" under the ESA is 0.5 (Wade and Angliss 1997). However, as total population estimates for the Eastern U. S. Steller sea lion stock have remained stable or increased over the last 20 years, the FR is set at 0.75, midway between 0.5 (FR for a "threatened" stock) and 1.0 (FR for a stock within its optimal sustainable population level). This approach is consistent with recommendations of the Alaska Scientific Review Group. Thus, for the Eastern U. S. stock of Steller sea lions, PBR = 2,378 animals (52,847 x 0.06 x 0.75).

8.3 Threats to the Eastern U.S. Stock of Steller Lions

8.3.1 Illegal Shooting

Illegal shooting of sea lions in U.S. waters was thought to be a potentially significant source of mortality prior to the listing of sea lions as threatened under the ESA in 1990. Such shooting has been illegal since the species was listed as threatened. (Note: the 1994 Amendments to the MMPA made intentional lethal take of any marine mammal illegal except for subsistence hunting by Alaska Natives or where imminently necessary to protect human life). Records from NMFS enforcement indicate that there were two cases of illegal shootings of Steller sea lions investigated in Southeast Alaska between 1995 and 1999: the cases involved the illegal shooting of one Steller sea lion near Sitka, and three Steller sea lions in Petersburg. Both cases were successfully prosecuted (NMFS, Alaska Enforcement Division). There are no records of illegal shooting of Steller sea lions from the Eastern U.S. stock listed in the NMFS enforcement records for 1999-2003 (NMFS, unpublished data).

Strandings of Steller sea lions with gunshot wounds do occur, along with strandings of animals entangled in material that is not fishery-related. During the period from 2004 to 2008, strandings of animals from this stock with gunshot wounds occurred in Oregon and Washington (one in 2004 and three in 2005) resulting in an estimated annual mortality of 0.8 Steller sea lions. This estimate is considered a minimum because not all stranded animals are found, reported, or cause of death determined (via necropsy by trained personnel). Reports of stranded animals in Alaska with gunshot wounds have not been included in the above estimates because it is not possible to tell whether the animal was illegally shot or if the animal was struck and lost by subsistence hunters (in which case the mortality would have been legal and accounted for in the subsistence harvest estimate).

8.3.2 Subsistence harvest

The subsistence harvest of Eastern Steller sea lions during 2004-2008 is summarized in Wolfe et al. (2009b). During each year, data were collected through systematic interviews with hunters and users of marine mammals in approximately 2,100 households in about 60 coastal communities within the geographic range of the Steller sea lion in Alaska. Approximately 16 of the interviewed communities lie within the range of the Eastern U.S. stock. The mean annual native Alaska subsistence take (catch plus struck and loss) is 11.9 animals per year (Table 8).

An unknown number of Eastern U.S. stock Steller sea lions are harvested by subsistence hunters in Canada. The magnitude of the Canadian subsistence harvest is believed to be small. Alaska Native subsistence hunters have initiated discussions with Canadian hunters to quantify their respective subsistence harvests, and to identify any effect these harvests may have on the cooperative management process.

8.3.3 Authorized Research Mortality

Mortalities may occur occasionally incidental to marine mammal research activities authorized under MMPA permits issued to a variety of government, academic, and other research organizations. Between 2003 and 2007, there were a total of 9 incidental mortalities resulting from permitted research on the Eastern U.S. stock of Steller sea lions, which results in an annual average of 1.8 mortalities per year from this stock (NMFS data).

8.3.4 Other Serious Injury Or Mortality

Stranding data may also provide information on additional sources of potential human-related mortality. Between 2001 and 2005 there were three reported non-fishery related serious injuries or mortalities to Steller sea lions in Washington and Oregon: one with a head injury (2001), one with a piece of cargo net around its neck (2003), and one mortality due to blunt trauma (2004). If the number of interactions (3) is averaged over 5 years, the “other” interaction rate would be a minimum of 0.6 animals per year.

8.4 Incidental Mortality & Serious Injury in Commercial Fisheries

8.4.1 Impacts of Fisheries outside of the US EEZ (Canada)

Due to limited observer program coverage, no data exist on the mortality of marine mammals incidental to Canadian commercial fisheries (i.e., those similar to U.S. fisheries known to take Steller sea lions). As a result, the number of Steller sea lions taken in Canadian waters is not known.

Steller sea lions were previously taken in British Columbia during commercial salmon farming operations. Preliminary figures from the British Columbia Aquaculture Predator Control Program indicated a mean annual mortality of 45.8 Steller sea lions from this stock over the period from 1999 to 2003 (Olesiuk 2004). Starting in 2004, aquaculture facilities were no longer permitted to shoot Steller sea lions (P. Olesiuk, Pacific Biological Station, Canada, pers. comm.).

8.4.2 Impacts of Commercial Fisheries in Alaska, Washington, Oregon, and California

Until 2003, there were six different federally regulated commercial fisheries in Alaska that could have interacted with the Eastern U.S. stock of Steller sea lions and were monitored for incidental mortality by fishery observers. As of 2003, changes in fishery definitions in the List of Fisheries have resulted in separating these 6 fisheries into 22 fisheries (69 FR 70094, 2 December 2004). This change does not represent a change in fishing effort, but provides managers with better information on the component of each fishery that is responsible for the incidental serious injury or mortality of marine mammal stocks in Alaska. Currently there are no Category 1 fisheries in the subject area reviewed by this document.

There is one Category II fishery, the Southeast Alaska Salmon Drift Gillnet fishery listed in the List of Fisheries as having taken Eastern U.S. stock Steller sea lions, most likely based on fisherman self reports or other anecdotal information from 1994 or earlier. More recent information is not available for this fishery at this time.

Data from Fisheries Observer Programs

Fishery observers monitored one Category III commercial fishery in Alaska during the period from 1990 to 2005 in which Steller sea lions from this stock were taken incidentally: the Gulf of Alaska sablefish longline fisheries. There have been no observer reported mortalities in the Gulf of Alaska sablefish longline since 2000 (Perez unpubl. ms.).

In the US EEZ outside of Alaska, fishery observers monitored three commercial fisheries during the period from 1990 to 2005 in which Steller sea lions from the Eastern U.S. stock were taken incidentally: the California (CA)/Oregon (OR) thresher shark and swordfish drift gillnet (Category III), WA/OR/CA groundfish trawl (Category III), and Northern Washington (WA) marine set gillnet fisheries (tribal, no category). The best data available on the rates of serious injury and mortality incidental to these fisheries is presented in Table 9. There have been no observed serious injuries or mortalities incidental to the CA/OR thresher shark and swordfish drift gillnet fishery in recent years (Carretta 2002, Carretta and Chivers 2003, Carretta and Chivers 2004). No data are available after 1998 for the northern Washington marine set gillnet fishery. No mortalities were reported by fishery observers monitoring drift gillnet and set gillnet fisheries in Washington and Oregon this decade; though, mortalities have been reported in the past.

These mortalities result in a mean annual mortality rate of 0.8 (CV = 0.02) for the Eastern U.S. stock of Steller sea lions based on fisheries observer data.

Data from Stranding Databases

Reports of stranded Eastern U.S. stock Steller sea lions provide additional information on the level of fishery-related mortality. Estimates of fishery-related mortality from stranding data are considered minimum estimates because not all entangled animals strand, and not all stranded animals are found or reported. In Alaska, during the 5-year period from 2004-2008, there were three mortalities of Steller sea lions due to ingestion of J-hooks attached to a “flasher” (an attractor used in salmon trolling) in which the hook was lodged in the esophagus and penetrating adjacent tissue (NMFS Alaska Region, unpublished data). A total of 121 observations of Steller sea lions with flashers hanging from their mouth were reported in Southeast Alaska and northern British Columbia between 2003 and 2007 (Raum-Suryan et al. 2009; Lauri Jemison, Steller Sea Lion Program, Alaska Department of Fish and Game, 1255 West 8th Street, P.O. Box 115526, Juneau, AK 99811). While it is not clear whether entanglements with hooks and flashers involved the recreational or commercial component of the salmon troll fishery, it is appropriate to call these entanglements "serious injuries" (Angliss and DeMaster 1998). These "opportunistic observations" indicate a rate 24.2 serious injuries/year from hook ingestion by Eastern U.S. stock Steller sea lions.

Mortality records from the Alaska stranding database indicate a rate of incidental mortality of at least 0.6 animals/year from the troll fishery. There were no fishery-related strandings of Eastern U.S. stock Steller sea lions in Washington, Oregon, or California between 2004 and 2008.

The minimum estimated M/SI rate incidental to commercial and recreational fisheries (both U.S. and Canadian) is 25.6 Eastern U.S. stock Steller sea lions per year, based on fisheries observer data (0.8), opportunistic observations (24.2), and stranding data (0.6).

8.5 Negligible Impact Analysis

8.5.1 Incidental Take and Serious Injury in Commercial Fisheries

Individual incidental serious injuries and mortalities to the Eastern U.S. stock of Steller sea lions caused by commercial fisheries in Alaska are summarized in Table 9. Only serious injuries and mortalities were used in making the negligible impact determination.

The time frame for these data used here is the five-year period from 2001 through 2005, although more recent data (to 2008) are included where available. Mortality due to subsistence harvest by Alaska Natives is available from 2004-2008 (Table 8). The GAMMS and the subsequent 2005 GAMMS update provide guidance that, when available, "it is suggested that mortality estimates could be averaged over as many years necessary to achieve a CV of less than or equal to 0.3, but should usually not be averaged over a time period of more than the most recent 5 years for which data have been analyzed" (Wade and Angliss 1997). This time frame provides enough data to adequately, capture year to year variations in take levels, while better reflecting current environmental and fishing conditions as they may change over time.

Data for serious injury and mortality incidental to commercial fishing operations includes observer data, subsistence harvest, and observations of stranded or entangled Steller sea lions reported to NMFS through various sources. Stranding data are opportunistic data that are reported to NMFS from various sources, including the general public, authorized members of the NMFS' marine mammal stranding networks, commercial fishermen, NMFS Enforcement, the U.S. Coast Guard, and others. Verification of some reports is often difficult, due to a lack of detailed information accompanying the report (such as positive species identification, location, indication of human interaction, etc.), resulting in reports that range from confirmed to unconfirmed. NMFS Alaska Region has developed guidelines for use in determining the types of stranding information that is considered sufficiently reliable to be used in assessments of the impacts of fisheries-related incidents on a marine mammal population. Serious injuries and mortalities that are included in the annual List of Fisheries may be included in the total serious injury/mortality across all U.S. fisheries where commercial fishing gear was seen attached to an animal or other specific indications of fishery interaction, but may not be attributable to a particular fishery. Only those serious injuries and mortalities in which the specific fishery can be positively identified are used in assessing the impacts of specific individual fisheries on marine mammal populations. Such fishery identification is made through identification of the associated gear type, gear registration number, or communication between NMFS staff, NMFS Enforcement, or the U.S. Coast Guard and the individual fishermen whose gear entangled the animal, or other compelling evidence.

Serious injuries were distinguished from non-serious injuries using results of a workshop addressing the issue (1998). This estimate is considered a minimum because not all entangled animals die and not all dead animals are found, reported, or cause of death determined. A Serious Injury Workshop was held in 2007 to re-evaluate 1999 NMFS guidelines used to determine if fishery entanglements, ship strikes, or other human interactions with a marine mammal results in serious injury. Revised guidelines for determining serious injury are expected to be finalized in the near future.

The average minimum estimated total of all known serious injury and mortalities to Eastern U.S. stock Steller sea lions incidental to commercial and recreational fisheries (both U.S. and Canadian) is 25.6 sea lions per year, based on fisheries observer data (0.8), opportunistic observations (24.2), and stranding data (0.6).

The current PBR for this stock is conservatively calculated at 2,378 animals (Allen and Angliss 2010). Therefore, the total annual average incidental take in commercial fisheries (25.6) in the US EEZ for the 2001-2005 (5yr) timeframe is < 10% of the PBR (237.8).

8.5.2 Other Human-Caused Injuries and Mortalities

The mean annual subsistence take from the Eastern U.S. stock of Steller sea lions over the 5-year period from 2004 through 2008 is 11.9 animals/year (0.5% of PBR).

The mean annual mortality of Eastern U.S. stock of Steller sea lions from 2004-2008 due to illegal shooting in Oregon and Washington is 0.8 mortalities/yr (0.03% PBR).

The mean annual mortality of Eastern U.S. stock Steller sea lions from “other non-fishery” mortalities reported by stranding data in Oregon and Washington from 2001-2005 is 0.6 mortalities/year (0.02% PBR).

The mean annual number of injury and mortality from research activities to the Eastern U.S. stock of Steller sea lions of the 5-year period from 2004-2008 is 1.8 mortalities per year (0.08% of PBR).

8.5.3 Total Human-Caused Mortality and Serious Injury

Based on available data, the estimated Total Human-Caused Mortality and Serious Injury (25.6 + 11.9 + 0.8 + 0.6 + 1.8 = 40.7) is less than the PBR (2,378) for the Eastern U.S. stock of the Steller sea lion *and* is less than 0.1 of PBR (237.8).

8.6 Application of Negligible Impact Determination Criteria

In applying the 1999 criteria (64 FR 28800, May 27, 1999) to determine whether M/SI incidental to commercial fisheries will have a negligible impact on a stock, the NID Criterion 1 is the starting point for analyses. If this criterion is satisfied, the analysis would be concluded. The remaining criteria describe alternatives applicable under certain conditions (such as fishery mortality below the negligible threshold but other human-caused mortality above the threshold, or fishery and other human caused mortality between the negligible threshold and PBR for a stock that is increasing or stable). If NID criterion 1 is not satisfied, NMFS may use one of the other criteria as appropriate.

The NID Criterion 1 states: "The threshold for initial determination will remain at 0.1 PBR. If total human-related serious injuries and mortalities are less than 0.1 PBR, all fisheries may be permitted." In this case, NID Criterion 1 was satisfied because the total human-related serious injuries 40.7 are less than the 0.1 PBR threshold (237.8). The overall PBR calculated for this stock is 2,378 animals (Allen and Angliss 2010). The annual average serious injury and mortality to the Eastern U.S. stock of Steller sea lions from all human-caused sources is 40.7 animals, which is 1.7% of this stock's PBR [2,378].

Only the M/SI incidental to commercial fishing is subject to the negligible impact determination; however, total human-caused M/SI of Eastern U.S. stock Steller sea lions should be below PBR. The total of 40.7 average annual M/SI per year is below the stock's PBR of 2,378.

8.7 Negligible Impact Determination

Based on the review of the best available scientific and commercial data and the applicability of the criteria for making a negligible impact determination under MMPA Section 101(a)(5)(E), all conditions of NID Criterion 1 (64 FR 28800, May 27, 1999) are met by the available serious injury and mortality data for the Steller sea lion, Eastern U.S. stock. NMFS has determined that the annual M/SI incidental to commercial fisheries (25.6 animals), with a US EEZ total annual M/SI of 40.7 animals, will have a negligible impact for purposes of issuing a permit under section 101(a)(5)(E) of the MMPA because total human-caused mortality is less than 10% of the stock's PBR. Accordingly, then, the expected level of M/SI incidental to commercial fisheries will not cause more than a 10% increase in the time to recovery for the Eastern U.S. stock of Steller sea lions. NMFS will re-evaluate this determination as new information becomes available.

9.0 Fin Whale: Northeast Pacific Stock

9.1 Species Information[7]

For this assessment, NMFS considered the impact of serious injury and mortality to NEP fin whales resulting from interactions with the above-described fisheries. The International Whaling Commission (IWC) first protected fin whales in the North Pacific in 1966. Fin whales were listed as Endangered under the ESA of 1973. They are also protected by the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) and the MMPA ("depleted" status). Critical habitat has not been designated for this species in waters off Alaska, California, Oregon, and Washington. A Recovery Plan was issued in July 2010 (http://www.nmfs.noaa.gov/pr/pdfs/recovery/finwhale.pdf) and an ESA 5yr Status Review initiated (72 FR 2649**;** January 22, 2007). The time frame for the data used in this analysis is the five-year period from 2002 through 2006, where available and when considered final.

For management purposes, three stocks of fin whales are currently recognized in U.S. waters: 1) Alaska (NEP), 2) California/Washington/Oregon, and 3) Hawaii. New information from Mizroch et al. (2009) suggests that this structure should be reviewed and updated, if appropriate, to reflect current data. A draft Negligible Impact Determination was made for the California/Oregon/Washington fin whale stock for fisheries in those regions (NMFS 2006); information concerning incidental M/SI in that document is incorporated herein by reference.

Distribution

Within the U.S. waters in the Pacific, fin whales are found seasonally off the coast of North America and in the Bering Sea during the summer (Figure 4). Recent information on seasonal fin whale distribution has been gleaned from the reception of fin whale calls by bottom-mounted, offshore hydrophone arrays along the U.S. Pacific coast, in the central North Pacific, and in the western Aleutian Islands (Moore et al. 1998, 2006, Watkins et al. 2000, Stafford et al. 2007). Moore et al. (1998, 2006) Watkins et al. (2000), and Stafford et al. (2007) documented high levels of fin whale call rates along the U.S. Pacific coast beginning in August/September and lasting through February, suggesting that these may be important feeding areas during the winter. While peaks in call rates occurred during fall and winter in the central North Pacific and the Aleutian Islands, there were also calls recorded during the summer months in the Gulf of Alaska (Stafford et al. 2007). While seasonal differences in recorded call rates are generally consistent with the results of aerial surveys which have documented seasonal whale distribution, it is not known whether these differences in call rates reflect true seasonal differences in whale distribution, differences in calling rates, or differences in oceanographic properties (Moore et al. 1998). Some fin whale calls have also been recorded in Hawaiian waters in all months except June and July (Thompson and Friedl 1982; McDonald and Fox 1999. Sightings of fin whales in Hawaii are extremely rare: There was a sighting in 1976 (Shallenberger 1981), a sighting by Dale Rice in 1979 (Mizroch et al. 2009) and a sighting during an aerial survey in 1994 (Mobley et al. 1996).

Surveys in the central-eastern and southeastern Bering Sea in 1999 and 2000 and in coastal waters of the Aleutian Islands and the Alaska Peninsula from 2001 to 2003 resulted in new

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[7] From Allen and Angliss (2010).

information about the distribution and relative abundance of fin whales in these areas (Moore et al. 2000, 2002; Zerbini et al. 2006). Fin whale abundance estimates were nearly five times higher in the central-eastern Bering Sea than in the southeastern Bering Sea (Moore et al. 2002), and most sightings in the central-eastern Bering Sea occurred in a zone of particularly high productivity along the shelf break (Moore et al. 2000).

9.2 Status of the Stock

Population size

Reliable estimates of current and historical abundance for the entire NEP fin whale stock are currently not available. Population surveys, resulting abundance estimates, and their regional significance and limitations are reviewed in Allen and Angliss (2010). Modern surveys include portions of the range south of the Aleutian Islands in 1994 (Forney and Brownell 1996), central-eastern Bering Sea in July-August 1999 and in the southeastern Bering Sea in June-July, 2000 (Moore et al. 2000, 2002), and coastal waters of western Alaska and the eastern and central Aleutian Islands in July-August 2001-2003 (Zerbini et al. 2006). Although the full range of the NEP stock of fin whales in Alaskan waters has not been surveyed, a rough estimate of the size of the population west of the Kenai Peninsula could include the sums of the estimates from Moore et al. (2002) and Zerbini et al. (2006). Using this approach, the provisional estimate of the fin whale population west of the Kenai Peninsula would be 5,700. This is a minimum estimate for the entire stock because it was estimated from surveys which covered only a small portion of the range of this stock.

Current Population Trend

Zerbini et al. (2006) estimated rates of increase of fin whales in coastal waters south of the Alaska Peninsula (Kodiak and Shumagin Islands). An annual increase of 4.8% (95% CI: 4.1-5.4%) was estimated for the period 1987-2003. This estimate is the first available for North Pacific fin whales and is consistent with other estimates of population growth rates of large whales. It should be used with caution, however, due to uncertainties in the initial population estimate for the first trend year (1987) and due to uncertainties about the population structure of the fin whales in the area. Also, the study represented only a small fraction of the range of the NEP stock.

Potential Biological Removal

Under the 1994 reauthorized MMPA, the PBR is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a FR: PBR = N_{MIN} x $0.5R_{MAX}$ x FR. The FR for this stock is 0.1, the recommended value for cetacean stocks which are listed as endangered (Wade and Angliss 1997). Thus, the PBR level for this stock is 11.4 (5,700 x 0.02 x 0.1).

9.3 Threats to the NPS of fin whales

9.3.1 Fishery Entanglements[8]

[8] From NMFS 2006

Entanglement in fishing gear can pose a threat to fin whales. About 73 balaenopterids were killed per year in the southern California offshore drift gillnet fishery during the 1980s (Heyning and Lewis 1990). Some of these may have been fin whales and some of them sei (*B. borealis*) whales. According to Barlow *et al.* (1997), fin whales in particular may also be taken in the drift gillnet fisheries for sharks and swordfish along the Pacific coast of Baja California, Mexico. Some gillnet mortality of large whales may go unobserved because whales swim away with a portion of the net; however, fishermen report that large whales usually swim through nets without entangling and with very little damage to the nets. However, there have been no reports of entangled fin whales to date in the EEZ offshore of Alaska.

9.3.2 Non-fishery Vessel Interactions in Alaska

Laist *et al.* (2001) compiled information available worldwide regarding documented collisions between ships and large whales (baleen whales and sperm whale) and found that fin whales were struck most frequently. In some areas studied, one-third of all fin whale strandings appeared to involve ship strikes. Fin whales are occasionally injured or killed by ship strikes off the east coast (Waring *et al.* 1997) and west coast of the United States. At least one, and probably more, fin whales were killed by collisions with ships off California in the early 1990s (Barlow *et al.* 1997). More recently, three fin whales were documented as killed due to ship strikes off California; one in 1997 and two between the period 2000-2005 (Carretta *et al.* 2006; California Marine Mammal Stranding Network Database 2006). Four fin whales were struck off the Northwest coast of the United States; three were identified in Washington and one was identified in Oregon (S. Norman, NMFS, pers. comm., 2006). Additional mortality from ship strikes probably goes unreported because the whales do not strand, or if they do, they do not always have obvious signs of trauma (Carretta *et al.* 2006).

The NMFS Alaska Region stranding data has twelve reports of fin whale mortalities dating back to 1981; for most of these cases, cause of death is unknown. In 2006, a fin whale was discovered on the bulbous bow of a cruise ship arriving in the port of Seward; a necropsy revealing fractured ribs and hemorrhage indicated that ship strike was the likely cause of death. In 2010, the death of a fin whale necropsied on Kodiak Island was attributed to ship strike based on skull fracturing and bruising. In addition, a non-lethal strike was reported in 2000, when a U.S. Coast Guard cutter traveling at 17 knots struck a fin whale in Uyak Bay, Kodiak; the animal exhibited no signs of injury or distress during immediate post-contact observations. Based on the one mortality between the 2002-2006 five year period, the minimum mean annual mortality/serious injury from ship strikes is 0.20 fin whale/yr in Alaska.

9.3.3 Subsistence harvest

Subsistence hunters in Alaska and Russia have not been reported to take fin whales from this stock.

9.3.4 Other Serious Injury or Mortality

As early as the mid-seventeenth century, the Japanese were capturing fin, blue, and other large whales using a fairly primitive open-water netting technique (Tønnessen and Johnsen 1982, Cherfas 1989). After blue whales were depleted in most areas, the smaller fin whale became the focus of whaling operations and more than 700,000 fin whales were landed in the twentieth century (NMFS 2006 EA). Between 1925 and 1975, 47,645 fin whales were reported killed throughout the North Pacific (International Whaling Commission, BIWS catch data, February 2003 version, unpublished), although newly revealed information about illegal Soviet catches indicates that the Soviets over-reported catches of about 1,200 fin whales, presumably to hide catches of other protected species (Doroshenko 2000).

9.4 Incidental Mortality & Serious Injury in Commercial Fisheries

9.4.1 Impacts of Fisheries outside of the US EEZ

No information is available addressing incidental catch in fisheries in Russia or Japan for NEP fin whales.

9.4.2 Impacts of Fisheries in Alaska

Until 2004, there were six different federally-regulated commercial fisheries in Alaska that occurred within the range of the Northeastern Pacific fin whale stock that were monitored for incidental mortality by fishery observers. As of 2004, changes in fishery definitions in the List of Fisheries have resulted in separating these six fisheries into 22 fisheries (69 FR 70094, 2 December 2004). This change does not represent a change in fishing effort, but provides managers with better information on the component of each fishery that is responsible for the incidental serious injury or mortality of marine mammal stocks in Alaska (Table 1).

Prior to 1999, there were no observed or reported mortalities of fin whales incidental to commercial fishing operations within the range of the Northeastern Pacific fin whale stock. However, in 1999, one fin whale was killed incidental to the Gulf of Alaska pollock trawl fishery. This take occurred in federal waters of statistical area 620, southwest of Kodiak Island (Perez 2003). Between 2002 and 2006, there was one observed incidental mortality of a fin whale in the Bering Sea/Aleutian Island pollock trawl fishery (Table 10), resulting in a mean annual mortality/serious injury of 0.23 fin whale/yr incidental to commercial fisheries in Alaska for this 5 yr period.

9.5 Negligible Impact Analysis

9.5.1 Incidental Takes in Commercial Fisheries

Individual incidental serious injuries and mortalities to the NEP stock of fin whales caused by commercial fisheries in Alaska are summarized in Table 10. The time frame for these data used here is the five-year period from 2002 through 2006.

Data for serious injury and mortality incidental to commercial fishing operations includes observer data, subsistence harvest, and observations of stranded or entangled NEP stock of fin whales reported to the NMFS AKR stranding network through various sources. Only two fin whale strandings have been reported - both in 2003, the cause of these dead strandings was not determined. Stranding data are opportunistic data that are reported to NMFS from various sources, including the general public, authorized members of the NMFS' marine mammal stranding networks, commercial fishermen, NMFS Enforcement, the U.S. Coast Guard, and others.

The average minimum estimated total of all known serious injury and mortalities to NEP stock of fin whales incidental to commercial and recreational fisheries (in Alaska) is 0.23 fin whale/yr based on fisheries observer data.

The current PBR for this stock is conservatively calculated at 11.4 animals (Allen and Angliss 2010). Therefore, the total annual average incidental take in commercial fisheries (0.23) in the US EEZ for the 2002-2006 (5yr) timeframe is < 10% of the PBR (11.4).

9.5.2 Other Human-Caused Injuries and Mortalities

None documented.

9.5.3 Total Human-Caused Mortality and Serious Injury

Based on available data, the estimated average human caused M/SI is 0.43 (0.2 + .023) fin whales/yr in the EEZ offshore of Alaska for the 2002-2006 (5yr) timeframe.

9.6 Application of Negligible Impact Determination Criteria

In applying the 1999 criteria (64 FR 28800, May 27, 1999) to determine whether M/SI incidental to commercial fisheries will have a negligible impact on a stock, the NID Criterion 1 is the starting point for analyses. If this criterion is satisfied, the analysis would be concluded.

The NID Criterion 1 states: "The threshold for initial determination will remain at 0.1 PBR. If total human-related serious injuries and mortalities are less than 0.1 PBR, all fisheries may be permitted." In this case, NID Criterion 1 was satisfied because the total human-related serious injuries (0.43) are less than 0.1 PBR (11.4).

9.7 Negligible Impact Determination

Based on the review of the available data and the applicability of the criteria for making a negligible impact determination under MMPA Section 101(a)(5)(E), all conditions of NID Criteria 1 are met by the available serious injury and mortality data for the NEP stock of fin whales. Therefore the NMFS has determined that the subject groundfish fisheries in the State of Alaska will have a negligible impact for purposes of issuing a permit under section 101(a)(5)(E) of the MMPA.

10. Sperm Whale, North Pacific Stock

10.1 Species Information

According to Allen and Angliss (2010), sperm whales are among the most widely distributed marine mammals and are found in all of the world's oceans. Seasonal detections of sperm whales indicate that sperm whales migrate to higher latitudes in summer and to lower latitudes in winter. Sperm whales are found throughout the North Pacific Ocean, and three stocks of sperm whales are identified in waters under U.S. jurisdiction. These stock stocks are the North Pacific (Alaska) stock, the Hawaii stock, and the California/Oregon/Washington stock. Additional information on sperm whales in the North Pacific Ocean may be found in Allen and Angliss (2010) and in NMFS (2010a).

10.2 Status of the Stock

Allen and Angliss (2010) report an estimated abundance of more than 1 million sperm whales in the Pacific Ocean prior to exploitation and that the current abundance of the sperm whales in waters off Alaska is unknown. They also report an estimate of about 100,000 whales in the WNP and add that this estimate may be an over-estimate. However, NMFS (2010a) states that practical working estimates of sperm whale abundance for the entire North Pacific range from 100,000 to 200,000 and that the number of sperm whales in the eastern North Pacific has been estimated to be 39,200.

NMFS has not conducted a complete survey for sperm whales in waters off Alaska, and the abundance of the stock is unknown. Allen and Angliss (2010) use an assumed value of 0.04 as the maximum net productivity rate of the stock. The PBR for the stock is not available.

10.3 Threats to the North Pacific Stock of Sperm Whales

The most important historical threat to sperm whales was over-exploitation during commercial whaling, and the abundances and densities of sperm whale populations were reduced substantially due to whaling operations. NMFS (2010a) reports that nearly 260,000 sperm whales were removed from the North Pacific between 1947 and 1987 and that this estimate is likely an under-estimate due to under-reporting by Russian whalers. The last year that Russia reported catches of sperm whales was in 1979, and the last year that Japan reported substantial catches was 1987; however, Japanese whales reported catches of 42 sperm whales between 2000 and 2006 (Allen and Angliss, 2010).

Allen and Angliss (2010) reported that sperm whales are not used for subsistence purposes by Alaska Natives. NMFS (2010a) reported that 31 sperm whale strandings occurred in Alaska during 1976-2009, and the causes of death in most cases are unknown. Allen and Angliss (2010) report no habitat issues of particular concern for sperm whales in Alaska.

10.4 Incidental Mortality and Serious Injury in Commercial Fisheries

Allen and Angliss (2010) reported the 5-year mean annual mortality and serious injury rate of sperm whales in Alaskan waters is 3.5 sperm whales per year, with 3 estimated deaths in 2006 and 10 estimated deaths in 2007, all of which occurred in the Gulf of Alaska sablefish longline fishery.

10.5 Negligible Impact Analysis

Criterion 1 in the 1999 guidelines indicates that total human-caused mortality and serious injury of the stock that is less than 10 percent of the stock's PBR would have a negligible impact on the affected stock. Because the PBR of the North Pacific stock of sperm whales is unknown, a direct application of the approach used in the 1999 guidelines is not possible. However, the available information can be analyzed to see if the intent of Criterion 1 can be supported.

Allen and Angliss (2010) estimate that the Gulf of Alaska groundfish fishery takes (by serious injury and mortality) an annual mean of 3.5 sperm whales. No other mortality or serious injury of sperm whales is reported or observed incidental to commercial fisheries in Alaska. No other sources of human-caused mortality and serious injury of sperm whales is reported in Alaska. The draft 2010 Pacific SAR for sperm whales in California, Oregon and Washington reports an annual rate of 0.2 human-caused deaths of sperm whales per year. Therefore, human-cause mortality and serious injury of sperm whales in the North Pacific stock may be estimated as 3.7.

The formula for calculating PBR of North Pacific sperm whales can be rearranged to estimate the number of sperm whales that would be required for 3.7 to be 10 percent of the stock's PBR. Rearranging the formula and solving for the minimum abundance estimate gives a minimum abundance of 18,500 sperm whales. NMFS (2010a) states that practical working estimates of sperm whale abundance for the entire North Pacific range from 100,000 to 200,000 and that the number of sperm whales in the eastern North Pacific has been estimated to be 39,200.

10.6 Negligible Impact Determination

The best available information (as reported in NMFS, 2010a, and Allen and Angliss, 2010) indicates that there are sufficient sperm whales in the eastern North Pacific Ocean so that human-caused mortality and serious injury are less than 10 percent of a PBR for sperm whales in the eastern North Pacific Ocean. Accordingly, a review of the best available scientific information and NMFS' 1999 guidelines for making NIDs shows that Criterion 1 is the appropriate criterion in this determination. Mortality and serious injury of North Pacific sperm whales incidental to commercial fishing would not cause more than a 10% delay in the time for the stock to recover, and NMFS finds that mortality and serious injury incidental to commercial fishing will have a negligible impact on the North Pacific stock of sperm whales.

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Table 1. Matrix of Category II and III commercial fisheries operating within the US EEZ offshore Alaska known to seriously injure or kill marine mammal species listed as threatened or endangered under the Endangered Species Act (source: 2011 List of Fisheries (75 FR 68465, November 8, 2010) and Allen and Angliss 2010.)

Fishery Description	Estimated # of vessels/persons	ESA-listed marine mammal species incidentally killed/injured
Listed as CATEGORY II		
State Managed		
GILLNET FISHERIES:		
AK Bristol Bay salmon drift gillnet	1,862	Steller sea lion, Western U.S.
AK Cook Inlet salmon set gillnet	738	Humpback whale, Central North Pacific[1] Steller sea lion, Western U.S.
AK Cook Inlet salmon drift gillnet	571	Steller sea lion, Western U.S.
AK Kodiak salmon set gillnet	188	Sea otter, Southwest AK Steller sea lion, Western U.S.
AK Peninsula/Aleutian Islands salmon set gillnet	115	Steller sea lion, Western U.S.
AK Prince William Sound salmon drift gillnet	537	Sea Otter, South Central AK Steller sea lion, Western U.S.[1]
AK Southeast salmon drift gillnet	476	Humpback whale, Central North Pacific[1] Steller sea lion, Eastern U.S.
AK Yakutat salmon set gillnet	166	Humpback whale, Central North Pacific (Southeast AK)
PURSE SEINE FISHERIES:		
AK Cook Inlet salmon purse seine	82	Humpback whale, Central North Pacific[1]
AK Kodiak salmon purse seine	370	Humpback whale, Central North Pacific[1]
Federally Managed		
TRAWL FISHERIES:		
AK Bering Sea, Aleutian Islands flatfish trawl	34	Steller sea lion, Western U.S.[1]
AK Bering Sea, Aleutian Islands pollock trawl	95	Humpback whale, Central North Pacific Humpback whale, Western North Pacific Fin whale, Northeast Pacific [2] Steller sea lion, Western U.S.[1]
LONGLINE/SET LINE FISHERIES:		
AK Bering Sea, Aleutian Islands Pacific cod longline	54	Steller sea lion, Western U.S.
POT, RING NET, AND TRAP FISHERIES:		
AK Bering Sea sablefish pot	6	Humpback whale, Central North Pacific[1] Humpback whale, Western North Pacific[1]

		Continued, next page
Listed as CATEGORY III		
State Managed:		
AK Prince William Sound salmon set gillnet	30	Steller sea lion, Western U.S.
AK salmon troll	2045	Steller sea lion, Eastern U.S. Steller sea lion, Western U.S.
AK commercial passenger fishing vessel	2,702	Steller sea lion, Eastern U.S. Steller sea lion, Western U.S.
AK Southeast Alaska crab pot	433	Humpback whale, Central North Pacific
AK Southeast Alaska shrimp pot	283	Humpback whale, Central North Pacific
Federally Managed:		
AK miscellaneous finfish set gillnet	3	Steller sea lion, Western U.S.
AK Gulf of Alaska sablefish longline	291	Steller sea lion, Eastern U.S. Sperm whale, North Pacific
AK halibut longline/set line (State and Federal waters)	2,521	Steller sea lion, Western U.S.
AK Bering Sea/Aleutian Islands Atka mackerel trawl	9	Steller sea lion, Western U.S.
AK Bering Sea/Aleutian Islands Pacific cod trawl	93	Steller sea lion, Western U.S.
AK Gulf of Alaska Pacific cod trawl	62	Steller sea lion, Western U.S.
AK Gulf of Alaska pollock trawl	62	Fin whale, Northeast Pacific Steller sea lion, Western U.S.

[1] Fishery classified based on serious injuries and mortalities of this stock, which are greater than 50 percent (Category I) or greater than 1 percent and less than 50 percent (Category II) of the stock's PBR.
[2]from Allen and Angliss (2010).

Table 2. Summary of the State of Alaska managed **Category 2** commercial fisheries (last updated 04/03/2008) based on Allen and Angliss (2010, Appendix 4).

Fishery (area and gear type)	Target species	Permits issued or fished (2007)	Soak time	Landings per day	Sets per day	Season duration	Fishery trends (1990-1997)
Southeast AK drift gillnet	salmon	476	20 min - 3 hrs; day / night	1	6 - 20	June 18 to Early Oct	# vessels stable but may vary with price of salmon; catch - high
Southeast AK purse seine	salmon	415	20 min-45 min; mostly daylight fishing, except at peak	1	6 - 20	end of June to early Sept	# vessel stable but may vary some with price of salmon; catch - high
Yakutat set gillnet	salmon	166	continuous soak during opener; day / night	1	net picked every 2 - 4hrs/day or continuous during peak	June 4 to mid-Oct	# sites fished stable; catch - variable
Prince William Sound drift gillnet	salmon	537	15 min - 3 hrs; day / night	1 or 2	10 - 14	mid-May to end of Sept	# vessels stable; catch - stable
Cook Inlet drift gillnet	salmon	571	15 min - 3 hrs or continuous; day only	1	6 - 18	June 25 to end of Aug	# vessels stable; catch - variable
Cook Inlet set gillnet	salmon	738	continuous soak during opener, but net dry with low tide; upper CI - day / night lower CI -day only except during fishery extensions	1	upper CI - picked on slack tide lower CI - picked every 2 - 6 hrs/day	June 2 to mid-Sept	# sites fished stable; catch - up for sockeye and kings, down for pinks
Kodiak set gillnet	salmon	188	continuous during opener; day only	1 or 2	picked 2 or more times	June 9 to end of Sept	# sites fished stable; catch - variable
AK Peninsula/Aleutians drift gillnet	salmon	162	2 -5 hrs; day / night	1	3 - 8	mid-June to mid-Sept	# vessels stable; catch up
AK Peninsula/Aleutians set gillnet	salmon	115	continuous during opener; day / night	1	every 2 hrs	June 18 to Mid-Aug	# sites fished stable; catch - up since 90; down in 96
Bristol Bay drift gillnet	salmon	1862	continuous soaking of part of net while other parts picked; day / night	2	continuous	June 17 to end of Aug or mid-Sept	# vessels stable; catch - variable
Bristol Bay set gillnet	salmon	983	continuous during opener, but net dry during low tide; day / night	1	2 or continuous	June 17 to end of Aug or mid-Sept	# sites fished stable; catch - variable
AK pair trawl	salmon	0					new fishery
Metlakatla/Annette Island drift gillnet	salmon	10					

CITATIONS

Alaska Commercial Fisheries Entry Commission (CFEC). 2008. Fishery Participation & Earnings. Accessed on 04/02/2008. http://www.cfec.state.ak.us/.

Table 3. (Source: Allen and Angliss 2010). Summary of incidental M/SI of humpback whales (Western North Pacific stock) due to commercial fisheries from 2002 to 2006 and calculation of the mean annual mortality rate (based on this period only). Mean annual mortality in brackets represents a minimum estimate. Details of how percent observer coverage is measured is included in Appendix 6 of Allen and Angliss (2010). N/A indicates that data are not available. Data in brackets (for 2007-2008) considered preliminary and are not included in the mean annual mortality estimate.

Fishery name	Years	Data type	Observer coverage	Observed mortality (in given yrs.)	Estimated mortality (in given yrs.)	Mean annual mortality
Bering Sea sablefish pot	2002	obs	40.6	0	1[1]	0.20[2]
	2003	data	21.7	0	0	(N/A)
	2004		49.1	0	0	
	2005		39.2	0	0	
	2006		35.3	0	0	
	2007		(N/A)	[0]		
	2008		(N/A)	[0]		
Observer program total						0.20
Minimum total annual mortality						0.2

[1] Mortality was seen by an observer but not during an "observed set"; thus quantification of effort cannot be accomplished and the single record cannot be extrapolated to provide a total estimated mortality level.
[2] These mortalities occurred in an area of known overlap with the Central North Pacific stock of humpback whales. Since the stock identification is unknown, the mortalities are reflected in both stock assessments.

Table 4. (Source: Allen and Angliss 2010). Counts of adult and juvenile Steller sea lions observed at rookery and haulout trend sites surveyed consistently since the late 1970s by year and geographical area for the western U. S. stock (NMFS 1995, Sease et al. 2001, Fritz et al. 2008b, NMFS 2008). Counts from 1976 to 1979 (NMFS 1995) were combined to produce complete regional counts that are comparable to the 1990-2008 data. Data from 2004 and 2008 reflect a 3.64% reduction from actual counts to account for improvements in survey protocol in 2004 relative to previous years (Fritz and Stinchcomb 2005).

Area	late 1970s	1990	1991	1992	1994	1996	1998	2000	2002	2004	2008
Gulf of Alaska	65,296	16,409	14,598	13,193	11,862	9,784	8,937[1]	7,995	9,087	8,993	10,931
Bering Sea/Aleutians	44,584	14,116	14,807	14,106	12,274	12.426	11,501	10,330	10,253	11,507	10,559
Total	109,880	30,525	29,405	27,299	24,136	22,210	20,438[1]	18,325	19,340	20,500	21,489

[1] Identifies 637 non-pups counted at six trend sites in 1999 in the eastern Gulf of Alaska which were not surveyed in 1998

Table 5. (Source: Allen and Angliss 2010). Summary of incidental mortality of Steller sea lions (western U. S. stock) due to fisheries from 2002 through 2006 (or most recent data available) and calculation of the mean annual mortality rate. Data and estimates of mean mortality in [brackets] is from 2007 and 2008 only, is considered preliminary, and may not be directly comparable to earlier values. Estimates of percent observer coverage and CVs are not currently available for some preliminary data. Mean annual mortality in {curly brackets} represents a minimum estimate from stranding data. The most recent 5 years of available data are used in the mortality calculation when more than 5 years of data are provided for a particular fishery. N/A indicates that data are not available. Details of how percent observer coverage is measured is included in Appendix 6 of Allen and Angliss (2010).

Fishery name	Years	Data type	Observer coverage	Observed mortality (in given yrs.)	Estimated mortality (in given yrs.)	Mean annual mortality
Bering Sea/Aleutian Is. Atka mackerel trawl	2002	obs data	98.3	0	0	0.25 (CV = 0.44)
	2003		95.3	1	1.2	
	2004		95.6	0	0	
	2005		97.8	0	0	
	2006		96.7	0	0	
	2007		-	[0]	[0]	[0]
	2008		-	[0]	[0]	
Bering Sea/Aleutian Is. flatfish trawl	2002	obs data	58.4	1	1.6	3.01 (CV = 0.23)
	2003		64.1	2	2.7	
	2004		64.3	2	3.1	
	2005		68.3	0	0	
	2006		67.8	4	7.6	
	2007		[61.2]	[4]	[5.0]	[8.85]
	2008		[79.8]	[10]	[12.7]	[CV = 0.15]
Bering Sea/Aleutian Is. Pacific cod trawl	2002	obs data	47.4	0	0	0.85 (CV = 0.73)
	2003		49.9	2	4.3	
	2004		50.4	0	0	
	2005		52.8	0	0	
	2006		50.4	0	0	
	2007		-	[3]	[3]	[1.5]
	2008		-	[0]	[0]	
Bering Sea/Aleutian Is. pollock trawl	2002	obs data	80.0	3	3.4	3.83 (CV = 0.13)
	2003		82.2	0	0	
	2004		81.2	1	1	
	2005		77.3	4	5.2	
	2006		73.0	7	9.5	
	2007		[95.0]	[2]	[2.1]	[5.6]
	2008		[88.6]	[8]	[9.1]	[CV = 0.12]
Gulf of Alaska Pacific cod trawl	2002	obs data	23.2	0	0	0
	2003		27.3	0	0	
	2004		27.0	0	0	
	2005		21.4	0	0	
	2006		22.8	0	0	
	2007		-	[0]	[0]	[0]
	2008		-	[0]	[0]	

Fishery name	**Years**	**Data type**	**Observer coverage**	**Observed mortality (in given yrs.)**	**Estimated mortality (in given yrs.)**	**Mean annual mortality**
Gulf of Alaska pollock trawl	2002 2003 2004 2005 2006 2007 2008	obs data	26.0 31.2 27.4 24.2 26.5 - -	0 1 0 1 0 [0] [0]	0 2.4 0 4.2 0 [0] [0]	1.33 (CV = 0.66) [0]
Bering Sea/Aleutian Is. Pacific cod longline	2002 2003 2004 2005 2006 2007 2008	obs data	29.6 29.9 23.8 24.6 23.9 - -	1 0 0 0 1 [0] [0]	3.7 0 0 0 6.2 [0] [0]	1.98 (CV = 0.66) [0]
Prince William Sound salmon drift gillnet	1990-1991	obs data	4-5%	0 2	0 29	14.5 (CV = 1.0)
Prince William Sound salmon set gillnet	1990	obs data	3%	0	0	0
Alaska Peninsula/Aleutian Islands salmon drift gillnet	1990	obs data	4%	0	0	0
Cook Inlet salmon set gillnet[1]	1999-2000	obs data	2-5%	0 0	0, 0	0
Cook Inlet salmon drift gillnet[1]	1999-2000	obs data	2-5%	0 0	0, 0	0
Kodiak Island salmon set gillnet	2002	obs data	6.0%	0	0	0
Observer program total						25.8 (CV = 0.60)
				Reported mortalities		
Alaska sport salmon troll (non-commercial)	1993-2005	strand	N/A	0, 0, 0, 0, 0, 1, N/A, N/A, N/A, 1, N/A, N/A, N/A	N/A	{0.2}
Miscellaneous fishing gear	2001-2005	strand	N/A	N/A, N/A, 1, N/A, N/A	N/A	{0.2}
Minimum total annual mortality						26.2 (CV = 0.60)

[1] Data from the 1999 Cook Inlet observer program are preliminary.

Table 6. Summary of the subsistence harvest data for the western Steller sea lions, 2003-2008.

	All areas except St. Paul Island			St. Paul Island	
Year	**Number harvested**	**Number struck & lost**	**Total**	**Number harvested + struck and lost**	**Total take**
2003	149.7	36.9	186.6[1]	18[6]	205
2004	136.8	49.1	185.9[2]	18[7]	204
2005	153.2	27.6	180.8[3]	22[8]	203
2006	114.3	33.1	147.4[4]	26[9]	173
2007	165.7	45.2	210.9[5]	34[10]	245
2008	114.7	21.6	136.3[5]	22	158
Mean annual take (2004-2008)	136.9	35.3	172.3	24	197

[1]Wolfe et al. 2004; [2]Wolfe et al. 2005; [3]Wolfe et al. 2006; [4] Wolfe et al. 2008; [5]Wolfe et al. 2009a; [5]Wolfe et al. 2009b; [6]Zavadil et al. 2004; [7]Zavadil et al. 2005; [8]Lestenkof and Zavadil 2006; [9]Lestenkof et al. 2007; [10]Lestenkof et al. 2008.

Table 7. Non-pup and pup counts from rookery and haulout sites of eastern Steller sea lions. The most recent counts for each site were used to calculate the minimum population estimate.

Trend site	**Year**	**Non-pups**	**Pups**	**Total count per site**
Southeast Alaska	2009	16,985	7,462	24,447
British Columbia	2006	15,700	4,118	19,818
Washington (Pitcher et al., 2007)	2001	516	--	516
Oregon Non-Pups	2002	4,169	--	4,169
Oregon Pups	2009		1,418	1,418
California	2009	1,588	891	2,479
Minimum population estimate				52,847

Table 8. Summary of the subsistence harvest data for Eastern U.S. stock Steller sea lions, 2004-2008.

Year	**Estimated total number taken**	**Number harvested**	**Number struck and lost**
2004	12[1]	5	7
2005	19[2]	0	19
2006	12.6[3]	2.5	10.1
2007	6.1[4]	0	6.1
2008	9.7[5]	1.7	8.0
Mean annual take (2004-2008)	**11.8**	1.8	10.0

[1] Wolfe et al. 2004; [2] Wolfe et al. 2005; [3] Wolfe et al. 2006; [4] Wolfe et al. 2009a; [5]Wolfe et al. 2009b.

Table 9. Summary of incidental mortality or serious injury to eastern Steller sea lions due to commercial fisheries from 2001 to 2005 (or most recent data available) and calculation of the mean annual mortality/serious injury rate. Mean annual mortality in brackets represents a minimum estimate from stranding data. Mean annual serious injury rate in {curly brackets}. The most recent 5 years of available data are used in the mortality calculation when more than 5 years of data are provided for a particular fishery. N/A indicates that data are not available. Details of how percent observer coverage is measured is included in Appendix 6 of the draft SAR (Allen and Angliss 2010).

Fishery name	Years	Data type	Observer coverage	Observed mortality (in given yrs.)	Estimated mortality (in given yrs.)	Mean annual mortality or serious injury
WA/OR/CA groundfish trawl (Pacific whiting component)	2000 2001 2002 2003 2004	Obs data	80.3 96.2 66.8 85.5 91.5	0 1 1 1 0	1[1] 1 1 1 0	0.8 (CV = 0.02)
Observer program total						0.8 (CV = 0.02)
Alaska salmon troll	1992-2005	Stranding data	N/A	0, 0, 0, 1, 0, 0, N/A, N/A, 1, 1, N/A, N/A, 2, N/A	N/A	[0.6]
Alaska salmon troll – unseparable commercial or recreational source	2004-2008	"opportunistic observational"	N/A	121 observtionsof "serious injury"	N/A	{24.2}

[1] A mortality was seen by an observer, but during an unmonitored haul; because the haul was not monitored, an estimated annual mortality cannot be extrapolated.

Table 10. Summary of incidental serious injury and mortality of fin whales due to commercial fisheries and calculation of the mean annual mortality rate. Mean annual takes are based on 2002-2006 data. Details of how percent observer coverage is measured is included in Appendix 6 of the draft SAR for fin whales (Allen and Angliss 2010).

Fishery name	Years	Data type	Percent observer coverage	Observed mortality	Estimated mortality	Mean annual takes (CV in parentheses)
BSAI pollock trawl	2002 2003 2004 2005 2006	obs data	 73.0	0 0 0 0 1	0 0 0 0 1.1	0.23 (CV = 0.34)
Estimated total annual takes						0.23 (CV = 0.34)

Figure 1. The action area addressed by this NID analysis includes all State of Alaska and Federally-managed fisheries operating within the Alaskan Exclusive Economic Zone (EEZ) and waters of the State of Alaska.

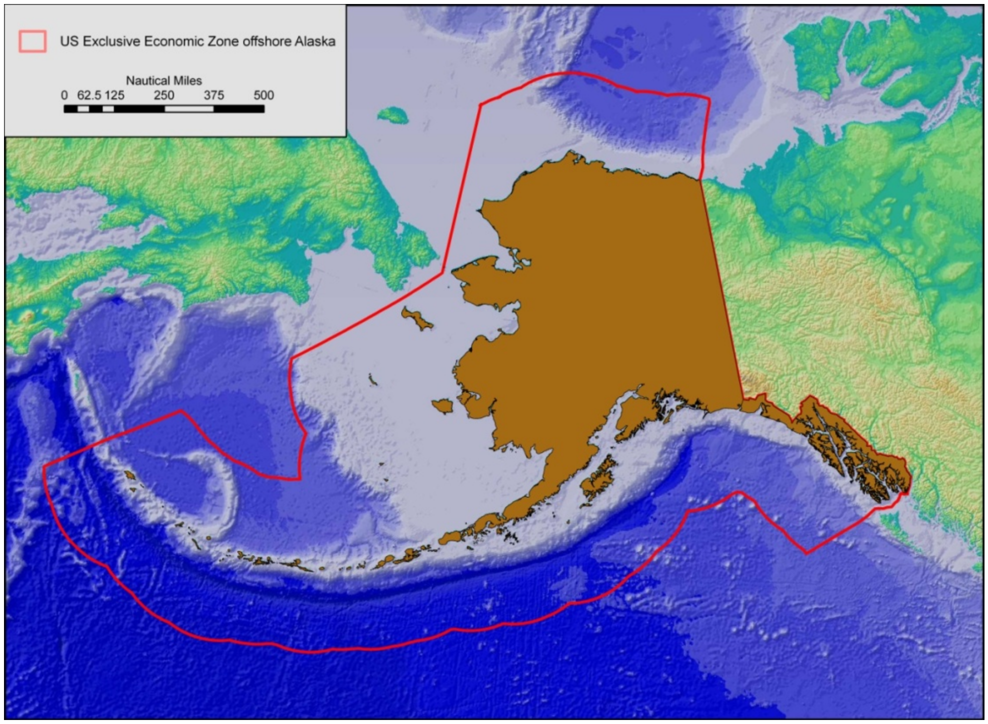

Figure 2. (Source: Allen and Angliss 2010). Counts of adult and juvenile Steller sea lions at rookery and haulout trend sites throughout the range of the western U.S. stock in Alaska, 1990-2008. Correction factor applied to 2004 and 2008 counts for film format differences (Fritz and Stinchcomb 2005).

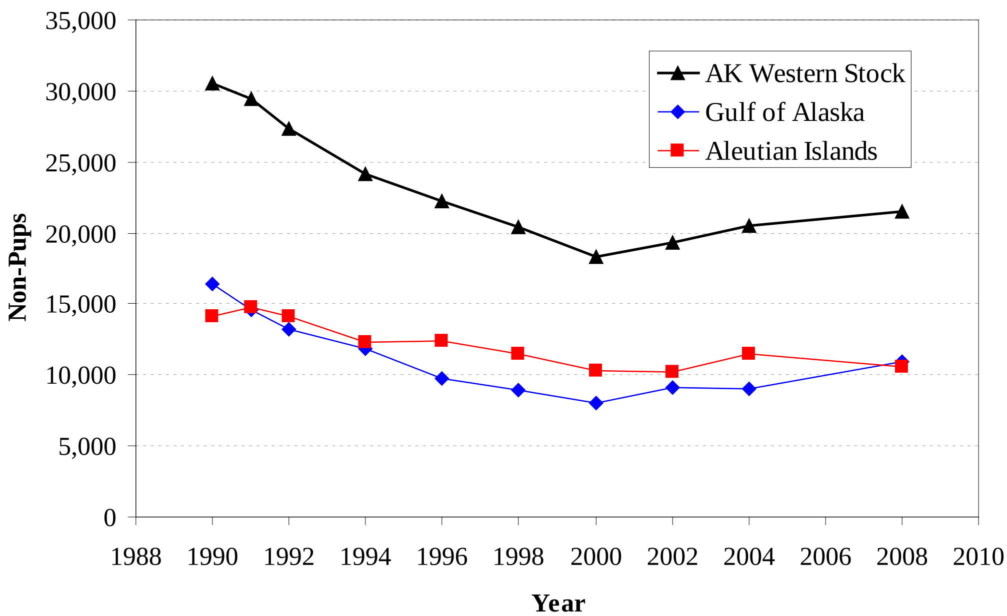

Figure 3. Counts of adult and juvenile Steller sea lions at rookery and haulout trend sites throughout the range of the eastern U.S. stock, 1982-2009. Data from British Columbia include all sites (from: Allen and Angliss 2010).

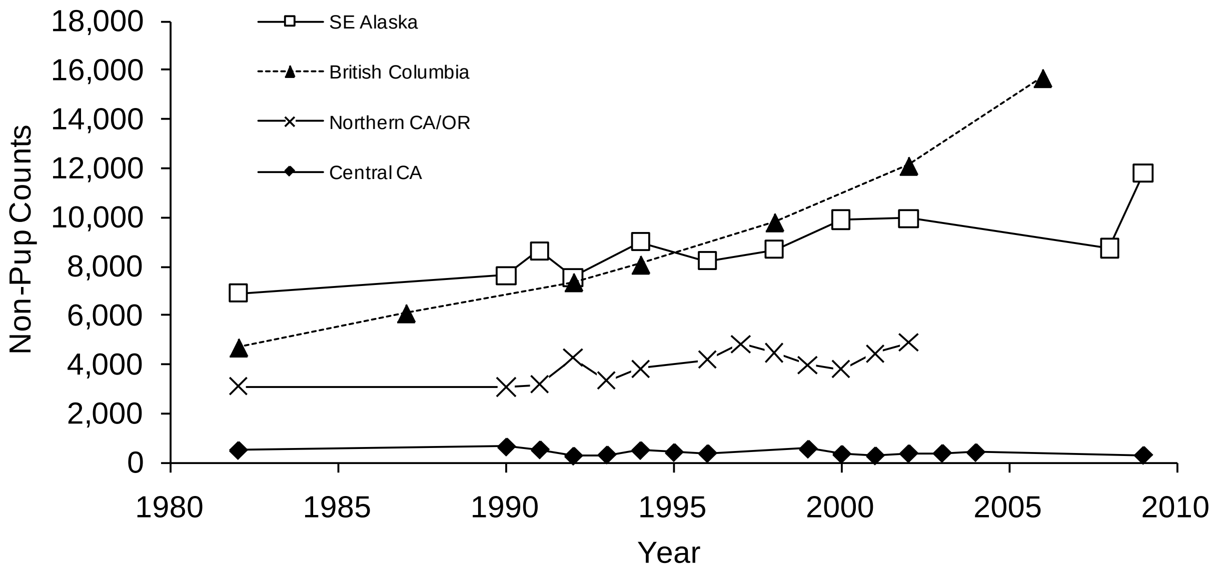

Figure 4. Approximate distribution of fin whales in the eastern North Pacific (shaded area). Striped areas indicate where vessel surveys occurred in 1999-2000 (Moore et al. 2002) and 2001-2003 (Zerbini et al. 2006) (from Allen and Angliss 2010).