DRAFT

Section 101(a)(5)(E) - Negligible Impact Determination
CA/OR/WA Fin Whale
Eastern North Pacific Humpback Whale
CA/OR/WA Sperm Whale

National Marine Fisheries Service
Protected Resources Division
Southwest Regional Office
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2.0 Introduction

Section 101(a)(5)(E) of the Marine Mammal Protection Act (MMPA), 16 U.S.C. 1361 *et seq*., states that NOAA's National Marine Fisheries Service (NMFS), as delegated by the Secretary of Commerce, shall allow the taking of marine mammal species listed under the Endangered Species Act (ESA), 16 U.S.C. 1531 *et seq.*, 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 (16 U.S.C. 1824(b)) for a period of up to three years. NMFS must 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) incidental mortality and serious injury 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 report is to explain the information, analyses and rationale for determining whether mortality and serious injury incidental to commercial fisheries will have a negligible impact on the California/Oregon/Washington (CA/OR/WA) stock of fin whales (*Balaenoptera physalus*), the CA/OR/WA stock of sperm whales (*Physeter macrocephalus*), and the Eastern North Pacific (ENP) stock of humpback whales (*Megaptera novaeangliae*), which are listed as endangered under the ESA as parts of the listing of the entire species of these marine mammals. One U. S. commercial fishery (*i.e.*, CA/OR drift gillnet fishery (DGN)) within the range of the CA/OR/WA fin and sperm whale, and ENP humpback whale populations has been observed to cause serious injury or mortality of these whales in the past. The remaining determinations related to recovery plans and the requirements of MMPA section 118 will be made in another document related to a proposal to issue the necessary permit.

2.1 History and 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 stock or stocks of marine mammals. Such determinations are required only in 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") or in permitting the take of threatened or endangered marine mammals incidental to commercial fishing operations.

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 stocks of marine mammals. For permitting the take of threatened or endangered marine mammals incidental to fishing operations, NMFS must determine if mortality and serious injury incidental to commercial fisheries will have a negligible impact on the affected species or stocks of marine mammals.

NMFS has implemented these programs, 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 for serious injury and mortality than for non-lethal takes because mortality and serious injury 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 first place one would look to evaluate Congressional intent regarding negligible impact is to read the definition in the MMPA. There is none. There is, however, a reference to negligible impact in the House of Representatives committee report for the MMPA Amendments of 1981, which is the time when "negligible impact" was added to the MMPA. That 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 2-part recommendation suggests that a take would be negligible if it had an effect lasting no more than 12 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 mortality and serious injury 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 10-20-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.

[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.

2.1.2 A Quantitative Approach

The Commission's guidelines suggested the beginnings of a quantitative manner 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 mortality and serious injury 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 (F_r) used in the calculation of Potential Biological Removal (PBR) for each stock of marine mammals should compensate for uncertainty and possible unknown estimation errors. In discussing the recovery factor for stocks of endangered species of marine mammals, participants noted that a F_r 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 mortality and serious injury remaining at or below PBR for an endangered stock (with 0.1 as the F_r 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 mortality and serious injury limited to a level no greater than a PBR calculated with F_r of 0.1 would be negligible; however, MMPA section 101(a)(5)(E) required a determination related to the impact of mortality and serious injury 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 mortality and serious injury incidental to commercial fishing in making the first negligible impact determinations[3]. (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 mortality and serious injury should be only a small portion of the maximum level of mortality and serious injury 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

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

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 mortality and serious injury rate from its implementation of the ZMRG.

In 1996, when NMFS marine mammal assessment scientists and managers, representatives of the US Fish and Wildlife Service, representatives of the Marine Mammal Commission, and members of regional Scientific Review Groups reviewed the guidelines for preparing marine mammal stock assessment reports, participants discussed F_rs 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 F_r for many stocks of endangered species, especially some of the large whales, could be too conservative, the large whales were placed on the list of endangered species primarily because there was no effective international management regime controlling commercial harvest, and many large whales may not currently be appropriately classified under the ESA. The workshop did not recommend a new default F_r 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.

Workshop participants also discussed the use of 10% of PBR as a threshold value for insignificant levels of mortality and serious injury of marine threatened and endangered species, which was at the time equated with a level of mortality and serious injury 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 at 36) Although participants agreed that 10% of PBR was an appropriate threshold value for insignificant levels of mortality for stocks with a F_r of 0.5, there was not a general agreement on an appropriate quantitative value for endangered stocks with F_r 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[4].

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 a F_r 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

[4] 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))

of annual mortality limited to a value equal to a PBR calculation with a F_r 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; however, none were received.

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 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.
>
> 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.
>
> 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.
>
> 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.

In proposing (65 FR 35904, June 6, 2000) and finalizing (65 FR 64670, October 30, 2000) a permit for the California/Oregon drift gillnet fishery to take threatened or endangered species of marine mammals incidental to the operations of the fishery, NMFS used the flexibility afforded by Criterion 3 from 1999 to determine that the fishery was having a negligible impact on the CA/OR/WA stock of sperm whales among other stock of threatened or endangered marine mammals. This fishery was the only reported source of human-caused mortality or serious injury of the stock, such removals were above 10% of the PBR, but removals were not above the PBR. Because the population was increasing, NMFS determined that the removals not greater than PBR of this stock of sperm whales would delay recovery of the stock by no more than 10 %, and, therefore, commercial fishing was having a negligible impact on the stock.

Based on the criteria listed above, the U.S. Pacific Marine Mammal Stock Assessment (SAR): 2005 and the best scientific information and data available, NMFS is determining that for a period of up to three years, mortality and serious injury incidental to commercial fisheries will have a negligible impact on the CA/OR/WA stock of sperm whales, the Eastern North Pacific stock of humpback whales, and the CA/OR/WA stock of fin whales.

3.0 Action Area

The action area is the U.S. Exclusive Economic Zones (EEZ) off the coast of California, Oregon, and Washington where fishing vessels are managed under the Fisheries Management Plan (FMP) (Figure 1). For more specific information on the location and gear configuration see, Section 5.0 and Appendix 2.

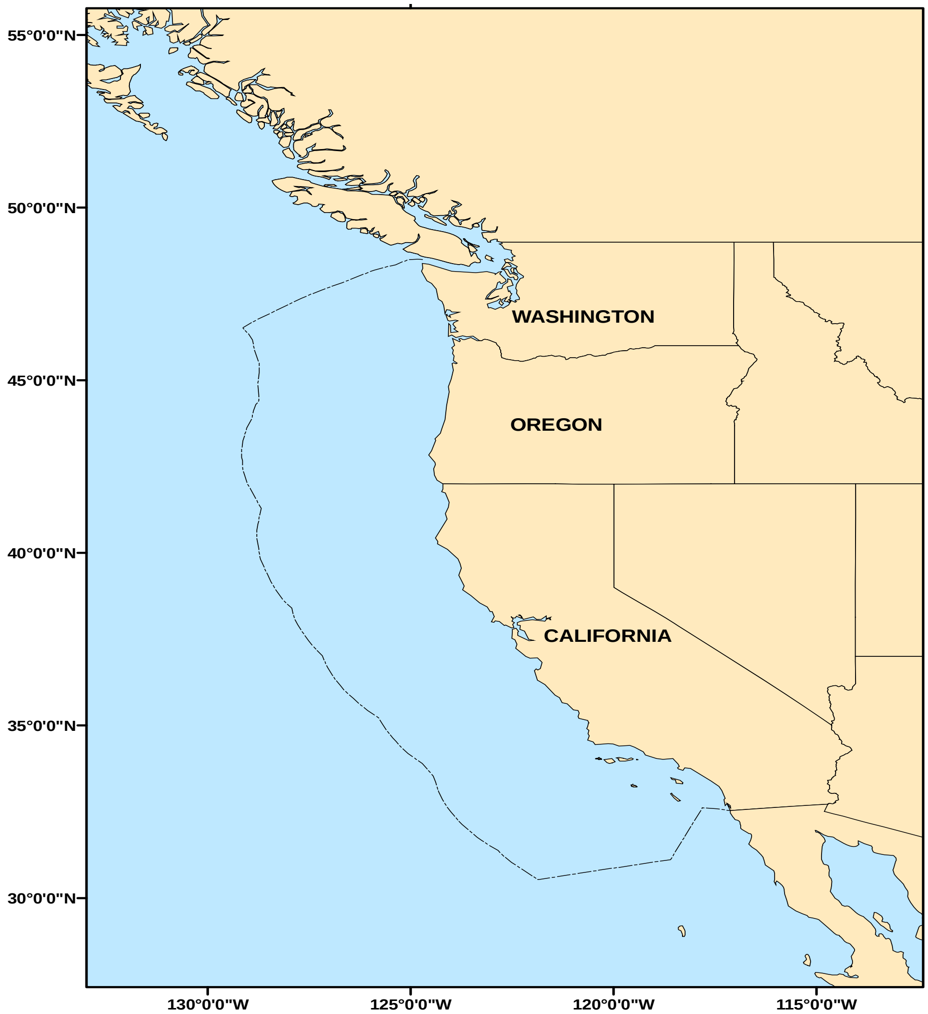

Figure 1. Action area off the coasts of California, Oregon and Washington. Dotted line delineates the U.S. EEZ.

4.0 Category I and II Fisheries in the Action Area

The fisheries included in Table 1 have been classified as either a Category I or II fishery[5] in the 2005 List of Fisheries (71 FR 247, January 4, 2006), based on the level of serious injury or mortality of marine mammals that occurs incidental to the fishery. Of these fisheries, only the

[5] Category I fisheries have frequent incidental mortality and serious injury of marine mammals, where as Category II fisheries have occasional incidental mortality and serious injury of marine mammals. Category III fisheries have a remote likelihood of, or no known incidental mortality and serious injury, of marine mammals. There are no permits for Category III fisheries because Category III fisheries "take," but do not serious injure or cause mortality. Thus, takes by Category III fisheries are not included in this permit.

CA/OR DGN fishery has had documented interactions with ESA-listed marine mammal species off California, Oregon, and Washington. Consequently, this fishery is the only fishery described below. A description of the remaining fisheries may be found in the most recently published SAR 2005 and the Alaska Marine Mammal Stock Assessment, 2005 (Angliss and Outlaw 2005; Carretta *et al*. 2006).

Table 1. Category I and II Fisheries off California, Oregon, and Washington (source: 2005 List of Fisheries (71 FR 247).

Fishery Description	**ESA-Listed Marine Mammals Incidentally killed/injured**
Category I	
CA angel shark/halibut and other species set gillnet (>3.5 inch mesh)	None
CA/OR thresher shark/swordfish drift gillnet (≥14 inch mesh)	Fin whale - CA/OR/WA stock Humpback whale - CA/OR/WA stock[1] Killer whale - CA/OR/WA Pacific stock[2] Sperm whale - CA/OR/WA stock Steller sea lion - eastern U.S. stock
Category II	
CA yellowtail, barracuda, white seabass and tuna drift gillnet fishery (mesh size >3.5 inches and <14 inches)	None
CA anchovy, mackerel, tuna purse seine	None
CA squid purse seine	None
CA pelagic longline	None
OR swordfish floating longline	None
OR blue shark floating longline	None

[1]This stock is classified as the "Eastern North Pacific Stock" in Carretta *et al*. (2006)
[2]The 2005 LOF lists the "CA/OR/WA Pacific stock" as incidentally killed/injured in this fishery. Based on the recent SARs, however, killer whale stocks found off the west coast include: (1) West Coast Transient stock; (2) Eastern North Pacific offshore stock; and (3) Eastern North Pacific Southern Resident Stock (currently listed as endangered) (Angliss and Outlaw 2005; Carretta *et al*. 2006)

<u>CA/OR Drift Gillnet Fishery (Category I)</u>

The CA/OR DGN fishery targets swordfish and thresher shark. Appendix 2 provides a general description of drift gillnet fishing practices. The CA/OR DGN fishery is a limited entry fishery with seasonal closures and gear restrictions (see Appendix 3). The state of Oregon restricts landing to swordfish only.

The CA/OR DGN fishery operates primarily outside of state waters to about 150 miles offshore ranging from the U.S. Mexico border in the south to northward of the Columbia River, depending on sea temperature conditions (Figure 2). Under regulations, the fishery is restricted to waters outside 200 nm from February 1 through April 30, outside 75 nm from May 1 through August 14, and is allowed to fish inside 75 nm from August 15 though January 31. Because of these restrictions, vessels are not active during February, March, and April, and very little fishing effort occurs during the months of May, June, and July, since CA/OR DGN vessels targeting swordfish tend to set on warm ocean water temperature breaks, which don't appear along the California coast until late summer.

In 2001, a seasonal (15 August-15 November) area closure was implemented in the DGN fishery north of Point Conception, to protect leatherback turtles that feed in the area and were observed entangled in previous fishing seasons. Additional seasonal/area closures in southern California have been established in the DGN fishery to protect loggerhead turtles during El Niño years. The number of vessels active in this fishery from 1998-2004 were, 98, 84, 78, 69, 50, 43, and 43, respectively. Information on the number of active permit holders is obtained from the *Status of the U.S. west coast fisheries for Highly Migratory Species through 2004*; *Stock Assessment and Fishery Evaluation* report, available from the Pacific Fishery Management Council website (www.pcouncil.org). Table 2, shows a summary of fishing effort and the number of observed sets for the DGN fishery, beginning with the year 2000, the year before the time/area closures were implemented.

Observer Information

The NMFS's Southwest Region has operated an at-sea observer program in the CA/OR DGN fishery since July 1990 to the present, while California Department of Fish and Game (CDFG) had operated a DGN observer program from 1980–90. The objectives of the NMFS Observer Program are to record, among other things, information on protected species and bycatch interactions that are not typically nor accurately reported in the fishing logbooks. Information regarding DGN fishery interactions with listed marine mammal species were drawn from Observer Program records for the years 1990–2005. Observer coverage of the DGN fleet targets 20 percent of the annual sets made in the fishery, with close to 100 percent of the net retrieval monitored on observed trips for, among other things, species identification and enumeration. Since 1990, approximately 7,200 DGN sets have been monitored by at-sea observers, generating a database with in excess of 28,000 records.

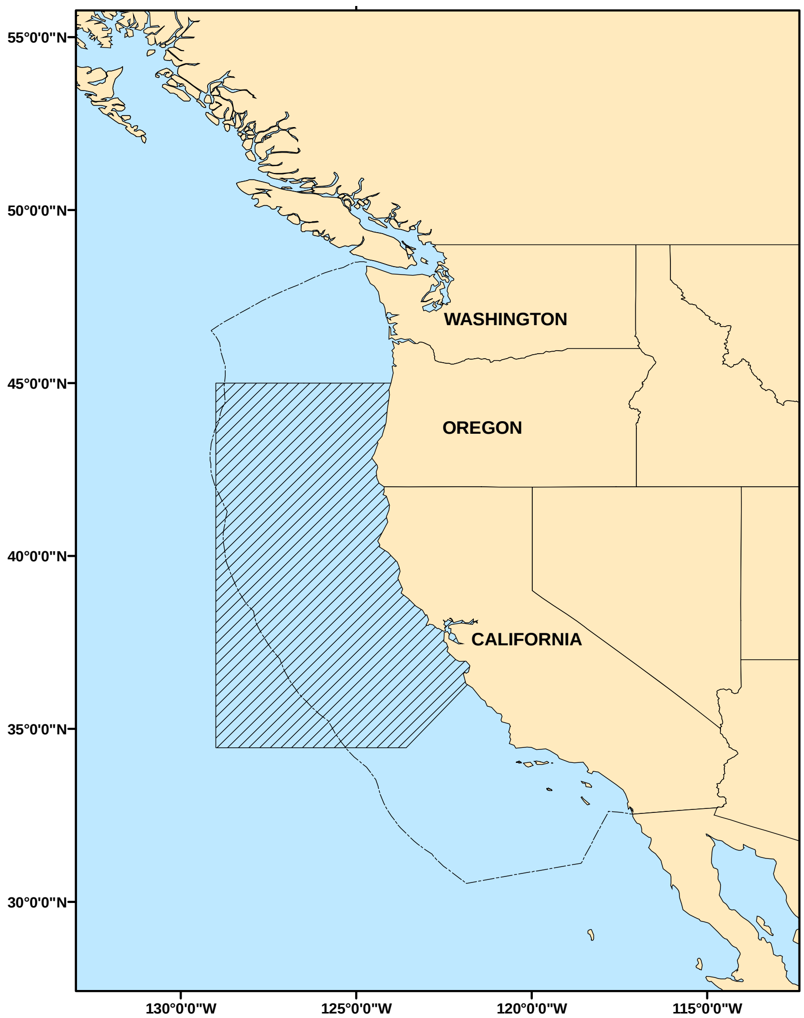

Figure 2. CA/OR DGN fishery area. Dotted line delineates U.S. EEZ, and the hatching indicates the sea turtles closure area.

Table 2. Summary of Fishing Season (May 1-January 31) for CA/OR DGN Observer Program from 2000-2005.

Fishing Season	Estimated Total Fishing Effort	Total Number of Observed Sets	Percent Observer Coverage
2000-2001	1,953	444	22.7
2001-2002	1,678	323	19.2
2002-2003	1,673	373	22.3
2003-2004	1,433	295	20.6
2004-2005	1,022	223	21.8

5.0 Marine Mammal Species Listed under the ESA

According to the *U.S. Pacific Marine Mammal Stock Assessments: 2005* (Carretta *et al.* 2006) and *Alaska Marine Mammal Stock Assessments: 2005* (Angliss and Outlaw 2005), there are nine species of marine mammals listed under the ESA that occur within the area of operation of Category I and II fisheries off California, Oregon, and Washington. These species, including their status, are listed in Table 3.

Table 3. ESA-Listed Marine Mammal Species off California, Oregon, Washington.

Species	Stock	Status
Blue whale (*Balaenoptera musculus*)	Eastern North Pacific stock, (formerly the California/Oregon/Washington-Mexico stock)	Endangered
Fin whale (*Balaenoptera physalus)*	California/Oregon/ Washington stock	Endangered
Humpback whale (*Megaptera novaeangliae*)	Eastern North Pacific stock, (formerly the California/Oregon/Washington-Mexico stock)	Endangered
Killer whale (*Orcinus orca*)	Eastern North Pacific Southern Resident stock	Endangered
North Pacific right whale (*Eubalaena glacialis*)	Eastern North Pacific stock	Endangered
Sei whale (*Balaenoptera borealis*)	Eastern North Pacific stock	Endangered

Sperm whale (*Physeter macrocephalus*)	California/Oregon/Washington stock	Endangered
Steller sea lion (*Eumetopias jubatus*)	Eastern U.S. stock	Threatened
Guadalupe fur seal (*Arctocephalus townsendii*)		Threatened

NMFS issued a 101(a)(5)(E) permit in October 2000 (65 FR 64670) for the CA/OR DGN fishery to incidentally take during the course of commercial fishing operations: the sperm whale, humpback whale, fin whale, and Steller sea lion, based on documented takes in the fishery. For that assessment, the CA/OR DGN fishery operated over a broader area than it currently operates, including fishing in the currently closed area north of Point Conception during August 15 through the fall months. The remaining listed marine mammal species (blue whales, North Pacific right whales, sei whales, and Guadalupe fur seals) were not included in the October 2000 permit and will not be included further in this analysis because since 1990, fishery interactions have not been observed for these species. Given 16 years of observer data and logbook information, NMFS does not anticipate the takes of these other listed species by Category I and II fisheries off California, Oregon, and Washington.

In 2005, the Eastern North Pacific Southern Resident stock of killer whales was listed as endangered under the ESA (70 FR 69903, November 18, 2005). This stock is most commonly seen in the inland waters of Washington state and southern Vancouver Island; however, individuals from this stock have been observed in Monterey Bay, California in January, 2000 and March, 2003, near the Farallon Islands in February 2005 and off Point Reyes in January 2006. In the CA/OR DGN fishery, no offshore killer whales have been observed entangled, but one killer whale from the non-ESA listed eastern North Pacific Transient Stock was observed taken in 1995 (Carretta *et al*. 2006). No resident killer whales have been observed taken in the CA/OR DGN. Set gillnets and longlines may take killer whales, based on information gathered on similar fisheries in other areas (Carretta *et al*. 2006). Because there have been no documented takes of this killer whale stock in west coast fisheries, NMFS does not anticipate the take (serious injury or mortality) of the Eastern North Pacific Southern Resident killer whale, and therefore this stock will not be considered further in this permit.

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. In U.S. waters, there are two separate stocks of Steller sea lions: an eastern U.S. stock, which includes animals east of Cape Suckling, Alaska (144^{o}W), and a western U.S. stock, which includes animals at and west of Cape Suckling (Loughlin 1997). The eastern stock of Steller sea lions, currently listed as threatened, has increased in abundance in California coastal waters and unlike the observed decline in the western U.S. stock of Steller sea lion, there has not been a concomitant decline in the eastern U.S. stock.

The eastern stock is the only stock that has been observed to interact with the CA/OR DGN fishery. However, there have been no observed serious injuries or mortalities, incidental to the this fishery, in recent years (Carretta 2002; Carretta and Chivers 2003; Carretta and Chivers 2004). During the most recent 5-year period (1999-2003), the minimum estimated fishery mortality and serious injury by the CA/OR DGN fishery for the eastern stock, can be considered insignificant and approaching zero (Carretta *et al*. 2006). During the past 15 years, only two Steller sea lions have been observed taken by the CA/OR DGN fishery, one off southern California in 1992, and one off the California/Oregon border in 1994. Both were mortalities. No Steller sea lions have been observed taken or reported since the implementation of the POCTRP, in October 1997. Implementing regulations of the POCTRP require fishermen to use 36 foot extenders and pingers. The Steller sea lions taken prior to the implementation of the TRP were taken in nets with 20 foot and 30 foot extenders (NMFS 2000). In addition, the pingers used on these nets[6] are within the hearing range of sea lions (Richardson *et al*. 1995), so they likely are alerted to any nets in the water. Therefore, although Steller sea lions and the CA/OR DGN fishery are known to co-occur in areas off the California and Oregon coast, the implementation of the POCTRP appears to have reduced the likelihood of an incidental take of Steller sea lions. Given this, there is a remote likelihood that the CA/OR DGN fishery will take Steller sea lions.

Fishery interactions with the eastern stock of Steller sea lions occur in other fisheries, and NMFS has determined that a 101(a)(5)(E) permit will be considered in the future by the Alaska Regional Office in cooperation with the Southwest Regional Office. Therefore, NMFS has not included Steller sea lions in the current analysis.

6.0 Marine Mammals Considered in This Analysis

For this assessment, NMFS will consider the impact of mortality and serious injury of sperm whales, humpback whales, and fin whales incidental to commercial fisheries.

6.1 CA/OR/WA Fin Whales

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. Critical habitat has not been designated for this species in waters off California, Oregon, and Washington.

6.1.1 Status of the species

Fin whales are widely distributed in the world's oceans; however, there is insufficient information to accurately determine population structure of the fin whale (Carretta *et al.* 2006). Fin whales are the second largest member of the family Balaenopteridae, reaching lengths of between 20 and 29 meters at adulthood (Aguilar and Lockyer 1987). Fin whales are dark gray dorsally and white underneath, with a long, slender body and a prominent dorsal fin about two-thirds of the way back on their body (Agler *et al.* 1990). Like other baleen whales, fin whales

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[6] Pingers are acoustic deterrent devices which, when immersed in water, broadcasts a 10 kHz (±2 kHz) sound at 132 dB (±4 dB) re 1 microPascal at 1 meter, lasting 300 milliseconds (+15 milliseconds).

have fringed baleen plates and ventral grooves, which expand during feeding. The lower jaw is gray or black on the left side and creamy white on the right side. This asymmetrical coloration extends to the baleen plates as well, and is reversed on the tongue. The ventral surfaces of the flippers and flukes are also white.

Fin whales have been known to associate with steep contours, either because tidal and current mixing along such gradients drives high biological production, or because changes in depth aid their navigation. Depending on food supply, fin whale groups may exhibit seasonal migration patterns to high latitudes in summer for feeding, and to low latitudes in winter, when they may be fasting. Other groups may remain in a particular area, depending on food supply. Thus, the local distribution of fin whales during much of the year is probably governed by prey availability.

Fin whales are found year-round off southern and central California, in the summer off Oregon, and in the summer and fall months, in the Shelikof Strait and Gulf of Alaska. From whaling records, fin whales that were tagged off southern California in the late fall early winter during 1962-1970 and were later taken in commercial whaling operations between central California and the Gulf of Alaska in the summer (Rice 1974; Mizroch *et al.* 1984). More recent observations show aggregations of fin whales year-round in southern/central California (Dohl *et al*. 1983; Barlow 1997; Forney *et al.* 1995). Acoustic signals from fin whales are detected year-round off northern California, Oregon and Washington, with a concentration of vocal activity between September and February (Moore *et al*. 1998). Since fin whale abundance appears lower in winter/spring in California (Dohl *et al*. 1983; Forney *et al*. 1995) and in Oregon (Green *et al*. 1992), it is likely that the distribution of this stock extends seasonally outside these coastal waters. Recent genetic studies of fin whales have shown that the population in the Gulf of California is isolated from fin whales in the rest of the eastern North Pacific and is an evolutionary unique population (Bérubé *et al.* 2002).

Based on shipboard surveys conducted in summer/autumn of 1996 (Barlow and Taylor 2001) and 2001 (Barlow 2003), researchers have estimated 3,279 (CV=0.31) fin whales off California, Oregon, and Washington, with a minimum of 2,541 whales (Carretta *et al*. 2006). This is probably a slight underestimate because it almost certainly excludes some fin whales which could not be identified in the field. There is some indication that fin whales have increased in abundance in California coastal waters between 1979/80 and 1991 (Barlow 1994) and between 1991 and 1996 (Barlow 1997), but these trends are not statistically significant. According to the most recent SAR: 2005 (Carretta *et al.* 2006), the PBR level for this stock is calculated as the minimum population size (2,541) times one half the default maximum net growth rate for cetaceans (½ of 4%) times a recovery factor of 0.3 (for an endangered species with N_{min}>1,500 and CV_{Nmin} <0.50), resulting in a PBR of 15 animals per year (Carretta *et al.* 2006).

6.1.2 Fishery Interactions

Entanglement in fishing gear poses 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.

Fin whales are occasionally killed or injured by inshore fishing gear (e.g., gillnets and lobster lines) off of eastern Canada and the United States (Read 1994; Lien 1994; Waring *et al.* 1997). Fin whales apparently are entangled in inshore fishing gear in the North Pacific, but only very rarely (Barlow *et al.* 1994, 1997).

The effects of trailing fishing gear on large whale species is largely unknown. NMFS sponsored a workshop to discuss methods for differentiating serious and non-serious injury of marine mammals taken in commercial fishing operations. Results of this workshop indicated that some, but not all, entanglements may result in serious injury or mortality (Angliss and DeMaster 1998). Available evidence from entangled North Atlantic right whales, indicates that while it is not possible to predict whether an animal will free itself of gear, a high proportion are believed to lose or extricate themselves based on scarring observed on apparently healthy animals. The workgroup was in general agreement that entanglement that impedes locomotion or feeding, or entanglement of young whales, should be considered a serious injury (Angliss and DeMaster 1998).

According to the 2005 SAR, the CA/OR DGN fishery is the only fishery that is likely to take a fin whale from the CA/OR/WA stock (Carretta *et al.* 2006). After the 1997 implementation of the POCTRP, which included skipper education workshops and required the use of pingers and minimum 6-fathom extenders, overall cetacean entanglement rates in the drift gillnet fishery have dropped considerably (Barlow and Cameron 2003). In addition, during the past 15 years (1990-2005), only one fin whale has been observed taken in the CA/OR DGN fishery; thus NMFS concludes an entanglement is a rare event.

6.1.3 Non-fishery vessel interactions

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 average observed annual mortality due to ship strikes is 0.4 fin whales per year, for the period 1997-2001 (Carretta *et al.* 2006)

Whale watching boats and boats from which scientific research is being conducted, specifically direct their activities toward whales and may directly or indirectly impact large whales. In waters off of Cape Cod, Massachusetts, fin whales were notably wary of vessels before the mid-1970s, but since then, they have become much less responsive to vessels (Watkins 1986). Edds and Macfarlane (1987) documented that a fin whale observed from an elevated site on the north shore of the St. Lawrence River, significantly reduced its mean dive time while it was being pursued by a ferry carrying whale watchers. Also in the St. Lawrence, Michaud and Giard (1998) documented short-term changes in dive behavior of fin whales approached by vessels. Fin whales observed from a lighthouse in Maine responded to the presence of vessels by decreasing dive times, surface times, and number of blows per surfacing (Stone *et al.* 1992).

Fin whales are much less often subject to whale watching in the eastern North Pacific than in the western North Atlantic. Thus, disturbance in the Pacific is more likely to come from the abundant industrial, military, and fishing vessel traffic off the Mexican, U.S., and Canadian coasts, than from the deliberate approaches of whale-watching vessels. The low-frequency sounds used by fin whales for communication and (possibly) in courtship displays (Watkins 1981) could be masked or interrupted by loud noise from ships. Table 4, summarizes human interactions with fin whales from 2000-2005.

6.1.4 Other Threats

Fin whales have been legally protected from commercial whaling for the last twenty or more years, and this protection continues. The main direct threat to fin whale populations is the possibility that illegal whaling or resumed legal whaling, will cause removals at biologically unsustainable rates. Additionally, reduced prey abundance due to overfishing or other factors (including climate change), habitat degradation, and disturbance from low-frequency noise, constitute the most obvious threats to fin whales besides vessel interactions and fishery entanglements. Trends in fish populations, whether driven by fishery operations, human-caused environmental deterioration, or natural processes, may strongly affect the size and distribution of fin whale populations.

Pollutants

No major habitat pollutants have been identified for fin whales in the North Pacific. There is no evidence that levels of organochlorines, other organotoxins, or heavy metals in baleen whales generally are high enough to cause toxic or other damaging effects (O'Shea and Brownell 1995). It should be emphasized, however, that very little is known about the possible long-term and trans-generational effects of exposure to pollutants. It is not known if high levels of heavy metals, PCBs, and organochlorines found in prey species accumulate with age and are transferred through nursing, as demonstrated in other marine mammals, such as killer whales. A study of Mediterranean cetaceans found high percentage levels of DDT in fin whale samples, which could have an effect on reproductive rates of this species, warranting further study (Fossi *et al.* 2003).

Underwater Noise

High-energy, low-frequency underwater sound transmissions, such as those produced by industrial and military activities, ship traffic, and scientific experimentation (e.g., Acoustic Thermometry of Ocean Climate (ATOC) in the North Pacific; and Frankel and Clark 1998), have the potential to disturb whales. The low-frequency sounds used by fin whales for communication and possibly in courtship displays (Watkins 1981), could be masked or interrupted by loud noise from ships, seismic testing, explosives, and other sources. In a study off Oregon, however, fin whales continued to produce their normal sounds despite the presence of seismic air gun pulses (McDonald *et al.* 1993). Studies of the responses of several whale species to the ATOC signal at Pioneer Seamount off Half Moon Bay, California, have been concluded. The ATOC project has been renamed the North Pacific Acoustics Lab (NPAL) and is currently seeking authorization to produce signals from a site off Kaua'i for a period of five years. Preliminary analysis shows that whales observed during trials were distributed slightly farther from the source when it was activated, compared with when it was not. No other significant changes in behavior or distribution were observed. However, it is important to recognize the difficulty of measuring behavioral or stress responses in free-ranging whales. Also, the cumulative effects of habitat degradation are difficult to define and almost impossible to evaluate.

Concern for the potential for injury or disturbance to cetaceans influenced the siting and timing of ship-shock trials on the Scotian Shelf in November 1994 (Reeves and Brown 1994), and off the California coast in June 1994. Monitoring programs were undertaken by the Canadian Department of Defense and the U.S. Navy, to ensure that whales were clear of the area during activities (Parsons 1995; Naval Air Warfare Center 1994). Recent military activities are not known to have had impacts on fin whales in the North Pacific. However, the large scale and diverse nature of military activities in this ocean basin mean that there is always potential for disturbing, injuring, or killing these and other whales.

Studies to assess the impact of loud low-frequency active sonar signals by the U.S. Navy continues under its Surveillance Towed Array Sensor System (SURTASS) Low Frequency Active (LFA) sonar program. The U.S. Navy completed a three-phase research program as the basis for an Environmental Impact Statement (EIS) on their SURTASS LFA sonar system. Phase I focused on the effects of the LFA signal on foraging blue whales in California; Phase II focused on the effects on migrating gray whales off California; and Phase III focused on its effects on humpback whales off Hawaii. These studies found that marine mammals exposed to the sound demonstrated no biologically significant response to the LFA sonar. A draft EIS was released for public comment in March, 1999, and a final EIS was released in January, 2001. A draft Supplemental EIS was released for public comment in November, 2005, and a final Supplemental EIS is expected to be released in the last quarter of 2006. NMFS expects to reassess marine mammal impacts based on information contained in the Supplemental EIS in the next several months (Kenneth Hollingshead, NMFS, pers. comm., 2006).

Hunting

Fin whales were hunted, often intensively, in all the world's oceans for the first three-quarters of the twentieth century. Fin whales were hunted at shore stations in western North America from the early twentieth century. Minimum recorded catches were 3,000 at Akutan, Alaska, 1912–39, and 464 at Port Hobron, Alaska, 1926–37 (Reeves *et al.* 1985); well over 6,000 in British Columbia, early 1900s to 1967 (Pike and MacAskie 1969); 602 in Washington, 1911–25 (Scheffer and Slipp 1948); 177 and 1,060 in California, 1919–26 (Clapham *et al.* 1997) and 1956–70 (Rice 1974), respectively.

Japanese pelagic whaling for fin whales in the Bering Sea and around the Aleutian Islands began in 1954 and continued through 1975 (Ohsumi 1986). A reported total of approximately 46,000 fin whales were killed by commercial whalers in the North Pacific between 1947 and 1987, including the shore-based catches mentioned above as well as Japanese and Russian pelagic catches (Barlow et al. 1997). Yablokov's (1994) acknowledgment that the Soviet Union engaged in the illegal killing of protected whale species in the North Pacific, both from land stations and in pelagic operations, implies that reported catch data are incomplete.

There is currently no legal whaling for fin whales in the Northern Hemisphere, apart from the annual take of up to about 20 fin whales in Greenland, which is sanctioned and managed under an IWC quota scheme. Iceland has consistently expressed a strong interest in resuming its whaling industry targeting fin, sei (*Balaenoptera borealis*), and minke whales (Sigurjónsson 1989). Well-documented pirate whaling in the northeastern Atlantic occurred as recently as 1979 (Sanpera and Aguilar 1992; Best 1992), and attempted illegal trade in baleen whale meat has been documented several times during the 1990s (Baker and Palumbi 1994). Since the mid-1970s, there has been a strong demand in world markets (most of it centered in Japan) for baleen whale meat (Aguilar and Sanpera 1982). Therefore, it cannot be assumed that Northern Hemisphere fin whales have been fully protected from commercial whaling since 1986 or that their current legal protection from commercial whaling will continue into the future.

6.1.5 Summary of Status

Fin whales in the entire North Pacific were estimated to be less than 38% of historic carrying capacity (Mizroch *et al.* 1984). An initial population abundance estimate has never been determined for this stock of fin whales, but it is likely that it was depleted by whaling, particularly in the 20th century. The fin whale is listed as "endangered" under the ESA and consequently it is automatically considered as a "depleted" and "strategic" stock under the MMPA. There is some indication that the population may be growing. Commercial whaling for this species ended in the North Pacific in 1976 and in the North Atlantic in 1987. Fin whales are still hunted in Greenland, subject to catch limits under the IWC's "aboriginal subsistence whaling" scheme. The threat to fin whales due to military activities, underwater noise, pollutants, marine debris, habitat degradation, etc., is not well known. The total incidental mortality due to fisheries (1.0 per year) and ship strikes (0.4 per year), appears to be less than the calculated PBR (15). Total fishery mortality is less than 10% PBR and therefore, may be approaching zero mortality and serious injury rate (Carretta *et al.* 2006).

6.2 Eastern North Pacific Stock of Humpback Whales

The IWC first protected humpback whales in the North Pacific in 1966. They are also protected under CITES. In the U.S. humpback whales were listed as "endangered" under the ESA of 1973 and are therefore classified as depleted and strategic stock under the MMPA. Critical habitat has not been designated for this species in waters off California, Oregon, and Washington.

6.2.1 Status of the Species

The humpback whale is distributed worldwide in all ocean basins. They typically migrate between tropical/sub-tropical and temperate/polar latitudes, occupying tropical areas during winter months when they are breeding and calving, and polar areas during the spring, summer, and fall, when they are feeding. The humpback whale is of medium size relative to other large whales, with females and males reaching an average length of around 14 meters and 13 meters, respectively (Nitta and Naughton 1989) and a weight of approximately 34 metric tons at maturity (Johnson and Wolman 1984). They are characterized by wing-like pectoral flippers that are from one-fourth to one-third of their total body length. Additionally, their heads are covered in tubercles, and their tail flukes have individually identifiable trailing-edge patterns. Like other balaenopterids, they have fringed baleen plates, which allow for the filtering of small crustaceans and fish.

Humpbacks primarily feed on small schooling fish and krill (Caldwell and Caldwell 1983). It is believed that minimal feeding occurs in wintering grounds, such as the Hawaiian Islands (Balcomb 1987; Salden 1989). Humpback whales summer throughout the central and western portions of the Gulf of Alaska, including Prince William Sound, around Kodiak Island (including Shelikof Strait and the Barren Islands), and along the southern coastline of the Alaska Peninsula. The few sightings of humpback whales in offshore waters of the central Gulf of Alaska are usually attributed to animals migrating into coastal waters (Morris *et al.* 1983), although it has been suggested that they may use offshore banks for feeding. The continental shelf of the Aleutian Islands and Alaska Peninsula was once considered the center of the North Pacific humpback whale population (Berzin and Rovnin 1966; Nishiwaki 1966). The northern Bering Sea, Bering Strait, and the southern Chukchi Sea along the Chukchi Peninsula appear to form the northern extreme of the humpback whale's range (Nikulin 1946, Berzin and Rovnin 1966).

Aerial, vessel, and photo-identification surveys, and genetic analyses indicate that within the U.S. EEZ, there are at least three relatively separate populations that migrate between their respective summer/fall feeding areas and winter/spring calving and mating areas (Calambokidis *et al*. 1997; Baker *et al*. 1998).

Currently, there are no statistically reliable estimates of humpback whale population abundance for the entire North Pacific. Barlow (2003) estimated 1,314 (CV=0.30) humpbacks in waters off California, Oregon, and Washington, based on summer/fall vessel surveys in 1996 and 2001. Ship surveys provide some indication that humpback whales increased in abundance in California coastal waters between 1979-80 and 1991 (Barlow 1994) and between 1991 and 1996 (Barlow 1997); however estimates declined between 1996 and 2001 (Barlow 2003). The

2002/2003 population estimate (1,391, CV=0.22) is higher than any previous estimates that may indicate that the apparent decline in the previous estimate exaggerates any real decline that might have occurred (Calambokidis *et al.* 2003) or that a real decline was followed by an influx of new whales from another area (Calambokidis *et al.* 2004). This latter view is substantiated by the greater fraction of new whales seen for the first time in 2003 (Calambokidis *et al.* 2004). Although these estimates are based on different methods and the earlier estimate is extremely uncertain, the growth rate implied by these estimates (6-7%), is consistent with the recently observed growth rate of the ENP stock (Carretta *et al.* 2006). The minimum population estimate for humpback whales in the Eastern North Pacific stock is taken as the lower 20th percentile of the log-normal distribution of 2002-2003 abundance estimates from mark-recapture methods (Calambokidis *et al.* 2004) or approximately 1,158 whales. The PBR level for this stock is calculated as the minimum population size (943) times one half the estimated population growth rate for this stock of humpback whales (½ of 8%) times a recovery factor of 0.1 (for an endangered species), resulting in a PBR of 4.6. Because this stock spends approximately half of its time outside the U.S. EEZ, the PBR allocation for U.S. waters is 2.3 whales per year (Carretta *et al.* 2006).

6.2.2 Fisheries Interactions

Entanglement in fishing gear poses a threat to individual humpback whales throughout the Pacific. Reports of entangled humpbacks whales found swimming, floating, or stranded with fishing gear attached have been documented in the North Pacific. The estimated impact of fisheries on this humpback whale stock is likely underestimated, since the serious injury or mortality of large whales due to entanglement in gear may go unobserved because whales swim away with a portion of the net, line, buoys, or pots. According to Carretta *et al.* 2006 and the California Marine Mammal Stranding Network Database (U.S Department of Commerce 2006), 12 humpback whales and two unidentified whales were entangled in fishing gear (all crab pot gear, except for one of the unidentified whales).

A number of fisheries based out of west coasts ports may incidentally take this stock of humpback whale, and documented interactions are summarized in the 2005 SAR (Carretta *et al.* 2006). The deaths of two humpback whales that stranded in the Southern California Bight have been attributed to entanglement in fishing gear (Heyning and Lewis 1990), and a humpback whale was observed off Ventura, California, in 1993, with a 20 foot section of netting wrapped around and trailing behind (Caretta *et al.* 2006). From 1999-2003, a humpback cow-calf pair was seen entangled in Big Sur, California (1999) and another single humpback was seen entangled in line and fishing buoys off Grover City, California (2000), but the fate of these animals is unknown. In 2003, there were five separate reports of humpback whales entangled in crap pot and/or polypropylene lines. In March 2003, an adult female with a calf was seen off Monterey with crab pot line wrapped around her flukes. An adult humpback was seen in May 2003 in the Santa Barbara Channel with 100 feet of yellow polypropylene line wrapped around its pectoral fins and caudal peduncle. Another adult female with a calf was seen in August 2003, west of the Farallon Islands with crab pot line with floats wrapped around its caudal peduncle and fluke lobe. In November 2003, there were two reports within four days near Crescent City and south of Humboldt Bay, California, of single humpback whales with crab pot line wrapped around their torso. These two reports may be the same whale, but the final status of these whales is unknown. Other unobserved fisheries may also result in injuries or deaths of humpback whales (Carretta *et al*. 2006).

The CA/OR DGN fishery may incidentally take ENP humpbacks from winter/spring populations in coastal Central America and Mexico which migrate to the coast of California to southern British Columbia in summer/fall (Steiger *et al*. 1991; Calambokidis *et al*. 1993).
The CA/OR drift gillnet fishery has been observed to take humpbacks, but based on 15 years of observer data, it is a rare event. From July, 1990 to October 29, 1997, the day before the effective date of the POCTRP, observers recorded the incidental entanglement of one humpback by the CA/OR drift gillnet fishery, in 1994, off southern California. This animal was released alive and uninjured (NMFS 2000). After the 1997 implementation of the Take Reduction Plan (TRP), which included skipper education workshops and required the use of pingers and minimum 6-fathom extenders, overall cetacean entanglement rates in the DGN fishery dropped considerably (Barlow and Cameron 2003). Following the implementation of the PCTRP, two humpbacks have been observed entangled. One humpback was observed taken in 1999, off southern California; this animal was also released alive and uninjured. The net had a full complement of pingers (41) and 36 foot extenders (NMFS 2000). The other humpback was observed taken in November, 2004, off San Clemente Island, in Southern California waters. The animal was released alive and uninjured, however, the net was not in full compliance with the PCTRP (NMFS Observer Program 2006). Because the humpbacks were released alive without any trailing gear, it is not considered a serious injury or mortality (Angliss and DeMaster 1998).

6.2.3 Non-fishery Vessel Interactions

Humpback whales, especially calves and juveniles, are highly vulnerable to ship strikes and other interactions with non-fishing vessels. Younger whales spend more time at the surface, are less visible, and closer to shore (Herman *et al.* 1980; Mobley, Jr. *et al.* 1999), thereby making them more susceptible to collisions. Humpback whale distribution overlaps significantly with the transit routes of large commercial vessels, including cruise ships, large tug and barge transport vessels, and oil tankers.

Ship strikes were implicated in the deaths of at least two humpback whales in 1993, one in 1995, and one in 2000 (J. Cordaro, NMFS unpublished data, *in* Carretta *et al*. 2006). During 1999-2003, there were an additional 5 injuries and two mortalities of unidentified whales, attributed to ship strikes. Additional mortality from ship strikes probably goes unreported because the whales do not strand or, if they do, they do not have obvious signs of trauma. Several humpback whales have been photographed in California with large gashes in their dorsal surface that appear to be from ship strikes (J. Calambokidis, pers. comm., *in* Carretta *et al.* 2006). The average number of humpback whale deaths by ship strikes for 1999-2003 is at least 0.2 per year (Carretta *et al.* 2006)

Whale watching boats and boats from which scientific research is being conducted, specifically direct their activities toward whales and may have direct or indirect impacts on humpback whales. The growth of the whale-watching industry has not increased as rapidly for the ENP stock of humpback whales, as it has for the Central North Pacific stock (wintering grounds in Hawaii and summering grounds in Alaska), but whale-watching activities do occur throughout the ENP stock's range. There is concern regarding the impacts of close vessel approaches to large whales, since harassment may occur, preferred habitats may be abandoned, and fitness and survivability may be compromised if disturbance levels are too high. While a 1996 study in Hawaii measured the acoustic noise of different whale-watching boats (Au and Green 2000) and determined that the sound levels were unlikely to produce grave effects on the humpback whale auditory system, the potential direct and indirect effects of harassment due to vessels cannot be discounted.

6.2.4 Other Threats

Humpback whales have been legally protected from commercial whaling for the last twenty or more years, and this protection continues. One of the main direct threats to humpback whale populations is the possibility that illegal whaling or resumed legal whaling, will cause removals at biologically unsustainable rates. Additionally, reduced prey abundance due to overfishing or other factors (including climate change), habitat degradation, and disturbance from low-frequency noise, constitute the most obvious threats to humpback whales besides vessel interactions and fishery entanglements. Trends in fish populations, whether driven by fishery operations, human-caused environmental deterioration, or natural processes, may strongly affect the size and distribution of humpback whale populations.

Underwater Sound

See Section 6.1.3.

Pollutants

The overall impact of pollution on habitats used by humpbacks is unknown. Concentrations of organochlorine pesticides, heavy metals, and PCB's have been reported in humpback whale tissues from the waters of Canada, United States, and Caribbean (Taruski *et al.* 1975). There is no evidence that levels of organochlorines, organotins, or heavy metals in baleen whales generally are high enough to cause toxic or other damaging effects (O'Shea and Brownell 1995). Indirect impacts from pollution could cause local depletion of prey that may occur as a result of displacement and mortality of food species. It should be emphasized, however, that very little is known about the possible long-term and trans-generational effects of exposure to pollutants.

Hunting

Commercial whale hunting, the single most significant impact on humpback whales, ceased in the North Atlantic in 1955 and in other oceans in 1966. In the North Pacific, humpbacks were estimated to have been reduced by 13% of carrying capacity by commercial whaling (Braham 1991). In 1987, the IWC set a quota of 3 humpback whales per year for each of the years 1987 through 1989 for the Island of Bequia, St. Vincent and the Grenadines and Lesser Antilles. Though hunting caused a major decline in all humpback whale populations, they are no longer endangered by that activity.

6.2.5 Summary of Status

Currently, there are no statistically reliable estimates of humpback whale population abundance for the entire North Pacific Ocean. Humpback whales of the North Pacific were estimated to be reduced to 13% of carrying capacity by commercial whaling (Braham 1991). The initial abundance estimate has never been estimated separately for the ENP stock, but this stock was also depleted (probably twice) by whaling (Rice 1974; Clapham *et al.* 1997). Humpback whales are formally listed as endangered under the ESA, and consequently the ENP stock is automatically considered as a "depleted" and "strategic" stock under the MMPA. Based on strandings, sightings, and observer data, the human caused mortality and serious injury of the ENP stock is likely greater than 10% of the PBR; therefore, the total fishery mortality may not be approaching zero mortality and serious injury rate (Carretta *et al.* 2006). However, the ENP stock appears to be increasing in abundance. The increasing levels of anthropogenic noise in the world's oceans, have been suggested to be a habitat concern for whales, particularly baleen whales, that may communicate using low-frequency sound.

6.3 CA/OR/WA Stock of Sperm Whales

Sperm whales have been protected from commercial harvest by the IWC since 1981, although the Japanese continued to harvest sperm whales in the North Pacific until 1988 (Reeves and Whitehead 1997). They are also protected by CITES. In the U.S., sperm whales were listed as endangered when the ESA was passed in 1973. Because of this, they are listed as depleted and a strategic stock under the MMPA. Critical habitat has not been designated for sperm whales in waters off California, Oregon, and Washington.

6.3.1 Status of the Species

Reaching 60 feet in length and weighing up to 45 tons, the sperm whale is the largest of the toothed whales, and is one of the most widely distributed of marine mammals worldwide, between 60°N and 70°S (Leatherwood and Reeves 1983). Sperm whales have a blunt head, which is squared off and can take up to 40 percent of its body length. It has a small underslung jaw, and its eyes are relatively small. Their bodies are a dark brownish gray with a rounded or triangular hump followed by knuckles along its spine. It has the largest brain of any animal on Earth, and its blunt snout houses a large reservoir of spermaceti, a high-quality oil. Sperm whales are found throughout the North Pacific and are distributed broadly from tropical and temperate waters to the Bering Sea as far north as Cape Navarin. Mature female and immature sperm whales of both sexes are found in more temperate and tropical waters from the equator to around 45°N throughout the year. These groups of adult females and immature sperm whales are rarely found at latitudes higher than 50°N and 50°S (Rice 1989; Reeves and Whitehead 1997). Sexually mature males join these groups throughout the winter. During the summer, mature male sperm whales are thought to move north into the Aleutian Islands, Gulf of Alaska, and the Bering Sea. They are often concentrated around oceanic islands in areas of upwelling, and along the outer continental shelf and mid-ocean waters.

Sperm whales are found year-round in California waters (Dohl *et al*. 1983; Barlow 1995; Forney *et al*. 1995). They reach peak abundance from April through mid-June and from the end of August through mid-November (Rice 1974). A 1997 survey to investigate stock structure and abundance of sperm whales in the eastern temperate North Pacific, revealed no apparent seasonal distribution pattern between the U.S. EEZ off California and areas farther west, out to Hawaii (Barlow and Taylor 1998).

There are large populations of sperm whales in waters that are within several thousand miles west and south of California, Oregon, and Washington region, although there is no evidence of sperm whale movements into this region from either the west or south. However, there are no abundance estimates for these areas off British Columbia. Mesnick *et al.* (1999), analyzed the genetic relationships of sperm whales in the eastern Pacific and found that the mitochondrial and microsatellite DNA of animals sampled in the California Current, is significantly different from animals sampled in the north-south subdivision and found significant subdivision between samples collected to the south (between the Gulf of California and waters off Central and northern south America and the Galapagos). Rendell *et al.* (2005, 2006) examined mitochondrial DNA variation among vocal clans of sperm whales from 194 individuals from 30 social groups belonging to one of three vocal clans. Results of statistical tests showed greater genetic subdivision among vocal clans than putative populations based on geography (Chile/Peru, Galapagos/Ecuador, SW Pacific) (Rendell *et al.* 2005, 2006).

The most recent abundance estimate is based on summer/autumn shipboard surveys conducted within 300 nm of the coasts of California, Oregon, and Washington in 1996 (Barlow 1997) and 2001 (Barlow 2003). The combined weighted estimate for the 1996 and 2001 surveys is 1,233 (CV=0.41) sperm whales (Barlow 2003). Given this estimate, the minimum population estimate for sperm whales is taken as the lower 20th percentile of the log-normal distribution of abundance estimated from the 1996-2001 summer/fall ship surveys off California, Oregon, and Washington (Barlow 2003) or approximately 885 (Carretta *et al*. 2006). If a correction factor (and associated variance) were available to correct the aerial survey estimates for missed animals, an improved minimum estimate would exist. Sperm whale abundance appears to have been rather variable off California between 1979/80 and 1996 (Barlow 1994; Barlow 1997) but does not show any obvious trends (Carretta *et al.* 2006). Based on the minimum population size (885) times one half the default maximum net growth rate for cetaceans (½ of 4%) times a recovery factor of 0.1 (the default value for an endangered species), the calculated PBR for the CA/OR/WA sperm whale stock is 1.8 animals.

6.3.2 Fisheries Interactions

Entanglement in fishing gear poses a threat to individual sperm whales and overall to the CA/OR/WA sperm whale stock. The vulnerability of sperm whales to incidental entanglement in fishing gear, especially gillnets set in deep water for pelagic fish (e.g., sharks, billfish, tuna) is well documented (Di Natale and Notarbartolo di Sciara 1994; Haase and Felix 1994; Felix *et al.* 1997). Sperm whales may become entangled in fishing gear while attempting to take fish off of the gear (most often demersal long-line gear), also known as “depredation” (Waring *et al.* 2005). The effect of trailing fishing gear on large whale species is largely unknown.

Prior to the implementation of the POCTRP on October 30, 1997, the CA/OR DGN fishery was observed to incidentally take seven sperm whales; of these whales, three were dead (43%), three were released alive and uninjured (43%), and one was released injured and was not expected to survive (14%). In 1992 the CA/OR DGN fishery was observed taking three sperm whales in one set off central California; two were alive and released uninjured, and one was dead. In 1993, two sperm whales were entangled in one set off southern California; one was alive and released uninjured, and one was dead. Also in 1993, one sperm whale was observed entangled and died in a drift gillnet off central California,. In 1996, one sperm whale was observed entangled and released injured (trailing gear, and wounded from ramming the vessel) off central California.

After the 1997 implementation of the POCTRP, overall cetacean entanglement rates in the fishery dropped considerably (Barlow and Cameron 2003). Since the implementation of the POCTRP, only one sperm whale was observed incidentally taken in 1998. This animal died in a net off central California which did not have the full complement of pingers. However, because sperm whale entanglements are rare and because the net which took the sperm whale did not use the full mandated complement of pingers, it is difficult to evaluate whether pingers are having any effect on sperm whale entanglement. The Pacific Offshore Cetacean Take Reduction Team and Pacific Scientific Review Group both recommended no further strategies to reduce sperm whale entanglement, until the effectiveness of pingers is better understood.

One sperm whale was found dead in Marin County, California in 2004, with monofilament netting in its stomach (California Marine Mammal Stranding Network Database; U.S. Department of Commerce 2006). It is not known if the marine debris was the cause of death, however.

6.3.3 Non-fishery Vessel Interactions

Sperm whales spend long periods (Jacquet *et al.* 1998) "rafting" at the surface between deep dives. This could make them vulnerable to ship strikes. Berzin (1972) noted that there were "many" reports of sperm whales of different age classes being struck by vessels, including passenger ships and tug boats. He also referred to instances in which sperm whales approached vessels too closely and were cut by propellers. One of nine sperm whales found stranded on the north coast of the Gulf of Mexico between 1987 and 1994 has "deep, parallel cuts posterior to the dorsal ridge that were believed to be caused by the propeller of a large vessel" (Waring *et al.* 1997). Due to the sperm whale's offshore distribution, it is likely that mortality and injury from ship strikes off the east of North America are documented less often than they occur.

Sperm whales are vulnerable to ship strikes (see Table 4). Two whales described as "possibly sperm whales" are known to have died in U.S. waters in 1990, after being struck by vessels (Barlow *et al.* 1997). Carcasses that do not drift ashore may go unreported, and those that do strand may show no obvious signs of having been struck by a ship.

Concern about the effects of whale-watching vessels has prompted field studies of sperm whale responses to boat approaches, and results suggest that sperm whales adjusted their diving and acoustic behavior to the whale-watching boats (Gordon *et al.* 1992). However, with frequent exposure, whales became increasingly tolerant of the vessels' presence. Sperm whales are not often seen from whale-watching vessels along the U.S. coast, and the potential for disturbance by such vessels is likely low.

6.3.4 Other Threats

Sperm whales have been legally protected from commercial whaling for the last twenty or more years, and this protection continues. One of the main direct threats to sperm whale populations is the possibility that illegal whaling or resumed legal whaling, will cause removals at biologically unsustainable rates. Additionally, reduced prey abundance due to overfishing or other factors (including climate change), habitat degradation, and disturbance from mid-frequency noise, constitute the most obvious threats to sperm whales besides vessel interactions and fishery entanglements. Trends in fish populations, whether driven by fishery operations, human-caused environmental deterioration, or natural processes, may strongly affect the size and distribution of sperm whale populations.

Underwater Sound

Sperm whales are known to respond to unfamiliar noise. Whales exposed to the sounds of pingers used in calibration systems to locate hydrophone arrays temporarily fell silent (Watkins and Schevill 1975). A stronger response was observed in sperm whales exposed to the intense sonar signaling and ship propeller noise from military operations in the Caribbean Sea during the U.S. invasion of Grenada in 1983. The whales fell silent, scattered, and moved away from the sound sources (Watkins *et al.* 1985). Sperm whales in the Indian Ocean appeared to react similarly (i.e., ceased to vocalize) to the airgun pulses from a seismic vessel more than 300 km away and to the low-frequency sounds transmitted during the pre-ATOC "Heard Island Feasibility Test" (Bowles *et al.* 1994). The loud signals used in LFAs are in the frequency range of 250-3,000 hertz (Frantzis 1998), meaning they are well within the likely range of sperm whale hearing.

Pollution

A dramatic increase in the rate of sperm whale strandings in western Europe since the early 1980's has raised concern that pollution might be implicated. Although tissues were analyzed for a wide range of contaminants and detailed pathological examinations were carried out, no clear link between contamination and stranding was found (Jacques and Lambertsen 1997). However, levels of mercury, cadmium, and certain organochlorines in the whale's tissues, were high enough to cause concern about toxicity and other effects (Bouquegneau *et al.* 1997; Law *et al.* 1997). Levels of contaminants in sperm whales killed off northwestern Spain indicated that the levels in females were consistently higher than those in males, a finding contrary to the usual situation in cetaceans (Aguilar 1983). The bottom-feeding habit of sperm whales, which might involve a suction mechanism, means they often ingest marine debris (Lambertsen 1997). One of 32 sperm whales examined for pathology in Iceland had a lethal disease thought to have been caused by the complete obstruction of the gut with plastic marine debris (Lambertsen 1990).

Hunting

The pelagic sperm whale hunt reached the North Pacific waters in the first quarter of the 19th century and remained active for approximately a century (Starbuck 1878; Best 1983; Hegarty 1959). Between 1800 and 1909, about 60,842 sperm whales were estimated taken in the North Pacific (Best 1979). North Pacific sperm whales were harvested by commercial whalers between 1947 and 1987 (Hill and DeMaster 1999). Catches in the North Pacific continued to climb until 1968, when 16,357 sperm whales were harvested. Catches declined after 1968 through limits imposed by the IWC. Based on the massive under-reporting of Soviet catches, Brownell *et al.* (1998), estimate that about 89,000 whales were additionally taken by the Soviet pelagic whaling fleet between 1949 and 1979. The Japanese coastal operations apparently also under-reported catches, by an unknown amount (Kasuya 1998). Thus, a total of at least 436,000 sperm whales were taken between 1800 and the end of commercial whaling for this species, in 1987. It has been suggested that the large 20th century catches of sperm whales in the North Pacific further reduced the population below pre-exploitation levels and possibly reduced pregnancy rates by reducing the number of breeding males (Whitehead 1987). There has been a prohibition on taking sperm whales in the North Pacific since 1988, but large-scale pelagic whaling stopped earlier, in 1980 (Carretta *et al.* 2006).

6.3.5 Summary of Status

Large populations of sperm whales exist in waters that are within several thousand miles west and south of California, Oregon, and Washington. However, there is no evidence of sperm whale movements into these regions from either the west of south and genetic data suggest that mixing to the west is unlikely. Current estimates for population abundance, status, and trends for the Alaska stock of sperm whales are not available (Hill and DeMaster 1999). Approximately 258,000 sperm whales in the North Pacific were harvested by commercial whalers between 1947 and 1987 (Hill and DeMaster 1999). Catches in the North Pacific continued to climb until 1968, when 16,357 sperm whales were harvested. Catches declined after 1968 through limits imposed by the IWC. Sperm whales are formally listed as endangered under the ESA and consequently this stock is automatically considered as a “depleted” and “strategic” stock under the MMPA. The annual rate of kill and serious injury (1.0 per year) is less than the calculated PBR for this stock (1.8). Total fishery takes may not be approaching zero mortality and serious injury (Carretta *et al.* 2006).

7.0 Interaction with Category I and II Fisheries in California, Oregon, and Washington

This section evaluates the available information to determine the likelihood of a fin, humpback, or sperm whale interacting with various commercial fisheries off California, Oregon, and Washington. This analysis assumes that fin, humpback, and sperm whales are not likely to be adversely affected by a fishery, if there have been no documented takes in that fishery, either through an observer program or through fisher self-reporting or logbooks. Of all the Category I and II fisheries, as currently listed in the 2005 List of Fisheries, listed marine mammal species under NMFS’ jurisdiction have only been observed taken in the CA/OR DGN fishery.

Information available for this analysis includes reports of actual interactions between the fishery and fin, humpback, and sperm whales, derived from observer programs, logbooks, and reports.

Impacts of CA/OR Drift Gillnet Fishery

In the CA/OR DGN fishery, a wide variety of marine mammals are killed, which is most likely attributable to the large geographic range of many of the species, non-selectivity of gear, and the amount and location of fishing effort. The probability that a marine mammal will initially survive an entanglement in fishing gear depends largely on the species, size, age, and health of the marine mammal involved. For instance, larger animals such as fin whales, humpback whales and sperm whales may become entangled in gillnet, but often survive the initial contact with the gear. Such entanglement may cause considerable damage to the gear, as the large whales "punch" through and continue swimming. Such damage may be related to the type of net used, however, fishermen do report that large blue and fin whales usually break through drift gillnets without entangling, and that very little damage is done to the net (Barlow *et al*. 1997).

Marine mammals may also swim away with a portion of the gillnet wrapped around a pectoral fin, the tail stock, the neck or the mouth. For large whales, there are generally three areas of entanglement in a net: 1) the gape of the mouth, 2) around the flippers, and 3) around the tail stock (although this area is often difficult to view, as most balaenopterids do not fluke frequently). Documented cases have indicated that entangled animals may travel for extended periods of time and over long distances before either freeing themselves, being disentangled by humans, or dying as a direct result of the entanglement (Angliss and DeMaster 1998). In most cases, it is unknown whether the injury is serious enough or debilitating enough to lead to death. If the debris fragments are heavy, the animal will most likely drown. Less heavy fragments may lead the animal to exhaustion, depletion of energy stores, and starvation due to the increased drag (Wallace 1985). In addition, if an animal's appendage is caught in a mesh or wrapped by a line, the gear can debilitate the animal, especially if it is constricting, causes lacerations, or impairs swimming or feeding ability (Scordino 1985). Younger animals are particularly at risk if the entangling gear is tightly wrapped, for as they continue to grow, the gear will likely become more constricting. The majority of large cetaceans that become entangled are juveniles (Angliss and DeMaster 1998). Marine mammals that die as a result of entanglement in drift gillnets usually drown. With a typical soak time of 12-14 hours, the animal is unable to survive without oxygen, especially if it is entangled at the beginning of the set, or deep in the net. Marine mammals may also be indirectly affected as a result of being captured in a drift gillnet. A sustained stress response, caused by repeated or prolonged entanglement in gear, may reduce fitness and make marine mammals more vulnerable to infection, disease, and predation (Angliss and DeMaster 1998).

In the CA/OR DGN fishery observers record detailed information on marine mammals entangled in the net. Animals that are released alive from the net with netting attached are classified as "injured." Animals that release themselves or are released from the net by fishermen and can swim normally are recorded as "alive." Long-term stress studies have not been conducted on the impacts of capture by a fishery on marine mammals, NMFS is only able to make assumptions on the condition of marine mammals that have been released "unharmed" from a drift gillnet. Although marine mammals released "unharmed" do not have visible injuries, they may have been stressed from being caught or entangled in a net. This stress may cause an interruption in essential feeding behaviors or migration patterns; however, NMFS considers this effect, if experienced, is likely to be temporary and short-term. For these reasons, NMFS assumes that most of the marine mammals released and reported as “unharmed,” or uninjured, recover fully and survive following their capture in a drift gillnet, and that latent effects are limited to short-term physiological stress or interruption of normal behavioral patterns.

Survival rate likely varies among marine mammal species incidentally taken by the CA/OR DGN fishery. This is due in part to variations in size and diving and foraging behavior, as well as location in the net and time of capture. With few observed marine mammal captures in the CA/OR DGN fishery, it is difficult to speculate as to the survival rate of the three listed species observed taken in the fishery, from 1990-2005. However, because the baleen whales (humpback and fin) and the sperm whale differ so greatly in the nature of their preferred prey and foraging behavior, as well as their physiology (e.g. the sperm whale is capable of diving to much greater depths than the baleen whales in order to find their preferred prey of squid, depending largely on oxygen storage and metabolism, while the baleen whales rely less on diving, if possible, and tend to skim and gulp for euphausiids at the surface or below), survival rates following gillnet entanglement most likely vary greatly as well. Of the 8 sperm whales entangled in CA/OR drift gillnet gear, 3 survived uninjured (37.5 percent), 1 was released injured (12.5 percent), and 4 were killed (50 percent). Of the 4 baleen whales entangled in drift gillnets, 3 were released alive and uninjured (all humpbacks) (75 percent), and one was killed (fin whale) (25 percent) (Carretta *et al.* 2006).

8.0 Negligible Impact Analysis

8.1 Incidental Takes in Commercial Fisheries

Individual incidental serious injuries and mortalities in commercial fisheries to fin, sperm, and humpback whales are summarized in the Table 4. Information on entanglements in fishing gear and results of the encounter are also included in Table 4.

The time frame for the data used in this analysis is from October 30, 1997 (post-Take Reduction Plan implementation), through 2005. This time frame was chosen because after the TRP was implemented, regulations required skippers to use 36’ extenders and pingers, which likely reduced the incidental take of many marine mammal species. This time frame also provided a comprehensive look at the fishery, given changes in oceanographic conditions, as well as fishing practices, given the 2001 closures to the CA/OR DGN fishery and the consideration of re-opening this area to limited fishing in 2006. The Guidelines for the Assessment of Marine Mammal Stocks (GAMMS) and the subsequent GAMMS II provide guidance that, when available, the most recent five-year time frame of commercial fishery incidental serious injury and mortality data is an appropriate measure of effects of fishing operations on marine mammals. This time frame provides enough data to adequately, though likely minimally, capture year to year variations in take levels, while better reflecting current environmental and fishing conditions as they may change over time. Additionally, because the permit issued under 101(a)(5)(E) is for a three-year period, the most up-to-date data available for complete years is used.

Data sources for serious injury and mortalities incidental to commercial fishing operations includes observer data and stranded or entangled whales reported to NMFS through various sources. Seriousness of injuries was assessed using guidelines developed for marine mammal stock assessments under the MMPA (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 conservative approach is taken in these analyses for evaluating the negligible impact of fisheries on these stocks, so in certain cases, the maximum number was used for the calculations. For example, if a ship strike occurred, but it is unknown whether it resulted in mortality, it was assumed that mortality occurred and the total number was used in the calculations.

The total of all known serious injury and mortalities due to commercial fishing operations for the time period from 1998 through 2005 is 5 fin whales, resulting in an annual average take of 0.63 animals. The overall PBR calculated for this stock is 15 animals. Therefore, the total annual average incidental take in commercial fisheries is 4.2% of the PBR. The total of all known serious injury and mortalities to the due to commercial fishing operations for the time period from 1998 through 2005 is 12 humpback whales, resulting in an annual average take of 1.5 animals. The overall PBR calculated for this stock is 2.3 animals. Therefore, the total annual average incidental take in commercial fisheries is 65.2% of the PBR. The total of all known serious injury and mortalities to the due to commercial fishing operations for the time period from 1998 through 2005 is 6 sperm whales, resulting in an annual average take of 0.75 animals. The overall PBR calculated for this stock is 2.3 animals. Therefore, the total annual average incidental take in commercial fisheries is 41.7% of the PBR.

8.2 Ship Strike Mortalities

The total number of serious injury and mortalities attributed to ship strikes for the same period is 5 known fin whale mortality plus 2 without known mortality attributed to the ship strike. No other sources of direct human-caused serious injury or mortality are known to affect the CA/OR/WA stock of fin whales. The total number of serious injury and mortalities attributed to ship strikes for the same period is 1 known humpback whale mortality and 1 without known mortality attributed to the ship strike. No other sources of direct human-caused serious injury or mortality are known to affect the ENP stock of humpback whales. The total number of serious injury and mortalities attributed to ship strikes for the same period is 1 known sperm whale mortality and 2 without known mortality attributed to the ship strike. No other sources of direct human-caused serious injury or mortality are known to affect the CA/OR/WA stock of sperm whales.

8.3 Total Human-Caused Mortality and Serious Injury

The known average annual human-caused mortality or serious injury, including ship strikes and incidental to commercial fishing for 1998-2005 is 1.01 fin whales or 6.7% of the PBR for the CA/OR/ WA fin whale stock. The known average annual human-caused mortality or serious injury, including ship strikes and incidental to commercial fishing for 1998-2005 is 1.75

humpback whales or 76.1% of the PBR for the ENP humpback whale stock. The known average annual human-caused mortality or serious injury, including ship strikes and incidental to commercial fishing for 1998-2005 is 1.13 sperm whales or 62.5% of the PBR for the CA/OR/WA sperm whale stock.

Table 4. Serious Injuries and Mortalities Incidental to Commercial Fisheries and Ship Strikes for fin, humpback, and sperm whales.

Fin Whale

Year	Fishery	Observed Mortality and Serious Injury	Estimated Entanglement Mortality and Serious Injury	Total Fishery Serious Injury and Mortality	Ship strike with known mortality	Ship strike without known mortality	Total ship strike
1997 (post TRP)							
1998							
1999	CA/OR DGN	1	5 (CV=0.94)	5			
2000							
2001						1	1
2002					4		4
2003							
2004					1		1
2005						1	1
Total 1998-2005				5			7
Avg 1998-2005				0.63			0.88
Ratio of Average Annual to PBR (PBR = 15)				**4.2%**			**5.9%**

Humpback Whale

Year	Fishery	Observed Mortality and Serious Injury	Estimated Entanglement Mortality and Serious Injury	Total Fishery Serious Injury and Mortality	Ship Strike with known Mortality	Ship Strike without known Mortality	Total Ship Strikes
1997 (post TRP)							
1998							
1999	CA unknown net fishery		2	2			
2000	CA pot gear		1	2	1		1
	CA unknown net fishery/pot gear		1				
2001	CA pot gear		1	1			
2002							
2003	CA crab pot gear		3	4			
	CA pot gear		1				
2004	CA unknown net fishery/pot gear		1	1			
2005	CA pot gear		1	2		1	1
	CA spot prawn pot		1				
Total 1998-2005				12			2
Avg 1998-2005				1.5			0.25
Ratio of Average Annual to PBR (PBR = 2.3)				**65.2%**			**10.9%**

Sperm Whale

Year	Fishery	Observed Mortality and Serious Injury	Estimated Entanglement Mortality and Serious Injury	Total Fishery Serious Injury and Mortality	Ship Strike with Known Mortality	Ship Strike without Known Mortality	Estimated Total Ship Strikes
1997 (post TRP)							
1998	CA/OR DGN	1*	5 (CV=0.89)	5			
1999							
2000					1		1
2001							
2002							
2003							
2004	CA Unknown Fishery**		1**	1			
2005						2	2
Total 1998-2005				6			3
Avg 1998-2005				0.75			0.38
Ratio of Average Annual to PBR (PBR = 1.8)				**41.7%**			**20.8%**

* Net did not have a full complement of pingers
** Monofilament netting found in stomach

9.0 Application of Negligible Impact Determination Criteria

In the applying the 1999 criteria (see pages 8-9 for these criteria) to determine whether mortality and serious injury incidental to commercial fisheries will have a negligible impact on a stock, criterion 1 is the starting point for analyses. If this criterion is satisfied, the analysis would be concluded. The remaining criteria describe alternatives 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 criterion 1 is not satisfied, NMFS may use one of the other criteria as appropriate. In this case, Criterion 1 was satisfied for the CA/OR/WA stock of fin whales but not for the other two stocks. Because the Eastern North Pacific stock of humpback whales and the CA/OR/WA stock of sperm whales are considered to be stable or increasing, Criterion 3 was the appropriate criterion.

The annual average serious injury and mortality to the CA/OR/WA stock of fin whales from all human-caused sources, including commercial fisheries (0.63 animals) + ship strikes (0.875 animals), is 1.51 animals, which is 10% of this stock's PBR. This is not less than 0.1 PBR, however, the abundance of this stock appears to be increasing, and the serious injury and mortality will not cause more than a 10% delay in recovery. During the past 16 years, only one fin whale has been observed taken by the CA/OR DGN fishery (1999; which is after the implementation of the TRP and prior to the 2001 closure off California/Oregon), indicating that the likelihood that a fin whale would be taken in the CA/OR DGN fishery is very low. NMFS determines that total human-caused mortality and serious injury of fin whales will be less than 10% of the PBR of this stock; therefore, mortality and serious injury of fin whales incidental to commercial fishing will have a negligible impact on the CA/OR/WA stock of fin whales.

The annual average serious injury and mortality to the ENP stock of humpback whales from all human-caused sources, including commercial fisheries (1.5 animals) + ship strikes (0.25 animals), is 1.75 animals, which is 76.1% of this stock's PBR (above the 0.1 PBR threshold, but below PBR). Although several humpback whales were entangled in recent years in crab pot gear and in unknown pot/net fisheries in California, the total fisheries-related serious injury and mortality is less than this stock's PBR. Since the beginning of the NMFS observer program in 1990, no mortalities or serious injuries of humpback whales have been attributed to the CA/OR DGN fishery. No other commercial fisheries have a history of causing mortality and serious injury of this stock. In addition, after the implementation of the TRP, overall cetacean entanglement rates in the DGN fishery dropped considerably. Lastly, the population for this stock is considered to be at least stable and is likely increasing by 6-7% per year (Carretta *et al.* 2006). Based on this, and because the estimated mortality and serious injury caused by commercial fisheries would not cause more than a 10% increase in the time to recovery, NMFS determines that mortality and serious injury incidental to commercial fisheries will have a negligible impact on the Eastern North Pacific stock of humpback whales.

The annual average serious injury and mortality to the CA/OR/WA stock of sperm whales from all human-caused sources, including commercial fisheries (0.75 animals) + ship strikes (0.38

animals), is 1.13 animals, which is 62.5% of this stock's PBR (above the 0.1 PBR threshold, but below PBR). The minimum population estimate for this stock is considered to be variable, with no obvious trend (Carretta *et al.* 2006). However, the overall population of sperm whales has increased worldwide since it was listed under the ESA in 1973, and although it is difficult to determine a trend for the CA/OR/WA stock of sperm whales, this stock does not appear to be declining. The average annual fisheries-related mortality and serious injury for this stock is below PBR. Since the implementation of the TRP, only one sperm whale was incidentally taken (1998; taken prior to the 2001 closure off central California/southern Oregon) in the CA/OR DGN fishery, but the net did not have a full complement of pingers; therefore, it is difficult to evaluate whether pingers have an effect on sperm whale entanglement. However, pingers have shown to have a positive effect on other odontocetes *(i.e.*, lower entanglement rates) (Barlow and Cameron 2003). Further, there has not been a take of sperm whales since 1998 and the likelihood that a sperm whale would be taken by the CA/OR DGN fishery is very low.

10.0 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 Criteria #1 Criteria #3 are met by the available serious injury and mortality data for the CA/OR/WA stock of fin whales and Criteria #3 are met by the available serious injury and mortality for the ENP stock of humpback whales and the CA/OR/WA stock of sperm whales. For the following stocks, NMFS has determined that the mortality and serious injury incidental to the CA/OR DGN fishery will have a negligible impact for purposes of issuing a permit under section 101(a)(5)(E) of the MMPA because the expected the levels of mortality and serious injury incidental to commercial fisheries will not cause more than a 10% increase in the time to recovery of the species or stock.

Fin whale, California/Oregon/Washington stock
Humpback whale, Eastern North Pacific stock
Sperm whale, California/Oregon/Washington stock

For the following species of marine mammal stocks listed as depleted under the MMPA because of their listing under the ESA, there is no documented evidence of interactions with the exception of the Steller sea lion which NMFS has determined is not likely to be taken by the CA/OR DGN fishery:

Blue whale, Eastern North Pacific stock
Sei whale, Eastern North Pacific stock
Guadalupe fur seal
North Pacific Right whale, Eastern North Pacific stock
Killer whale, Eastern North Pacific Southern Resident stock
Steller sea lion, Eastern North Pacific stock; since implementation of POCTRP in 1997

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12.0 APPENDIX 1

Marine Mammal Stock Assessment Terminology

Under section 117 of the MMPA, NMFS and the U.S. Fish and Wildlife Service are required to publish stock assessment reports for all stocks of marine mammals within U.S. waters, to review new information every year for strategic stocks and every three years for non-strategic stocks, and to update the stock assessment reports when significant new information becomes available. A strategic stock is:

a. A marine mammal species that is listed as endangered or threatened under the ESA;
b. A marine mammal stock for which the human-caused mortality exceeds the potential biological removal (PBR) level; or
c. A marine mammal stock which is declining and likely to become listed as a threatened species under the ESA.

The PBR level is the maximum number of animals, not including natural mortalities, that may be annually removed from a marine mammal stock while allowing that stock to reach or maintain its optimal sustainable population level (OSP). Optimum sustainable population means the number of animals which will result in the maximum productivity of the population or species. The PBR level is the product of the following factors: 1) The minimum population estimate of the stock (N_{MIN}); 2) One-half the maximum theoretical or estimated net productivity rate of the stock at a small population size, where net productivity is the annual per capita rate of increase in a stock resulting from additions due to reproduction, less losses due to mortality (½ R_{MAX}); and 3) A recovery factor (R_F) or “safety factor” of between 0.1 and 1.0 to hasten the recovery of depleted populations and to account for additional uncertainties. The use of PBR as a management scheme is a conservative approach that will allow populations to recover to or remain above OSP. Wade (1998), using simulation models, demonstrated that a PBR calculated with a recovery factor of 0.1 would meet two performance goals: 1) 95% of simulations would equilibrate within 95% of carrying capacity (K), and 2) there would be no more than a 10% delay in recovery. Mortality limits were evaluated based on whether at least 95% of the simulated populations met two criteria: 1) the populations starting at the maximum net productivity levels (MNPL) stayed there or above after 20 years, and 2) that populations starting at 30% of K recovered to at least MNPL after 100 years (Wade 1998).

When calculating PBRs, NMFS chose to use a value of 0.1 for the safety factor for species listed as endangered under the ESA, based partly on the rationale that this would not cause more than a 10% increase in the time to recovery (Barlow *et al*. 1995). Using 0.1 as a safety factor in the PBR equation would allow a large fraction of the net production of the population to contribute to population increase and eventual recovery, and thus, have a relatively insignificant negative impact upon the population (Wade 1998). For depleted and threatened stocks and stocks of unknown status, a recovery factor of 0.5 is used, and for stocks thought to be within OSP, a recovery factor of 1.0 is used (Barlow *et al*. 1995). However, before the recovery factor is set as high as 1.0, reasonable scientific justification needs to be provided that the estimates of abundance and mortality are not severely biased and have estimated coefficients of variation

(CVs) less than or equal to 0.8 for the abundance estimate and 0.3 for the mortality estimates (Barlow *et al*. 1995).

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13.0 APPENDIX 2

Fishery Descriptions

California/Oregon Drift Gillnet Fishery

Gillnets are more formally referred to as “gill and trammel” nets. A trammel net works by entangling the entire fish. All of the swordfish gillnets are driftnets, which the net, when set, drifts free in the current. Typically, besides an appropriate vessel, drift gillnet gear required for this fishery includes a net, 45 to 60 large inflatable ball buoys, a spar buoy called a “high flyer” affixed with a radar reflector and strobe light, a deck mounted hydraulically powered reel on which to store the net, and a reel mounted level wind to assist in deploying, and retrieving the net (Pacific Fishery Management Council 2003). Fishers use nets constructed from 3-strand twisted nylon, tied to form meshes. The meshes range from 18 to 20 inches between opposing knots when the mesh is stretched together. Net dimensions range from 90 to 170 feet deep and from 4,800 feet long to the legal maximum of 6,000 feet finished length (Pacific Fishery Management Council 2003). The top of the net is attached to a float line by hanging lines laced through several meshes and tied at intervals of 8 to 24 inches. The number of meshes per hanging determines the slack or tautness of the net. The bottom of the net is attached to a weighted lead line. The depth at which the float line is suspended in the water column is determined by the length of the buoy line (extender length). The net is suspended below the sea surface by the ball buoys to a depth equal to the length of the buoylines. The depth has historically ranged from 18 feet to as much as 90 feet, but is currently limited by regulations under the MMPA to a minimum depth of 36 feet. Nets are often set perpendicular to currents, or across temperature, salinity, or turbidity fronts. Nets are typically set in the evening, allowed to soak overnight, then retrieved in the morning, typically before sunrise. The average soak time is 10.5 hours (NMFS 1997). The vessel remains attached to one end of the net during the soak period, drifting with the net.

The California/Oregon drift gillnet (CA/OR DGN) fishery operates primarily outside of state waters to about 150 miles offshore ranging from the U.S. Mexico border in the south to northward of the Columbia River depending on sea temperature conditions. Under California State regulations, the fishery is restricted to waters outside 200 nm from February 1 through April 30, outside 75 nm from May 1 through August 14, and is allowed to fish inside 75 nm from August 15 though January 31. The Oregon State regulations for the developmental drift gillnet fishery mirror the State of California regulations. Due to these restrictions, vessels are not active during February, March, and April, and very little fishing effort occurs during the months of May, June, and July since CA/OR DGN vessels targeting swordfish tend to set on warm ocean water temperature breaks which don’t appear along the California coast until late summer.

West Coast Longline Fishery

Longline fishing gear consist of a main line strung horizontally across 1-100km (<1-62 miles) of ocean supported at regular intervals by vertical float lines connected to surface floats. Descending from the main line are branch lines, each ending in a single, baited hook (Pacific Fishery Management Council 2003). The main line droops in a curve from one float line to the next and bears some number of branch lines between floats. When targeting swordfish, vessels typically fish 24 to 72 kilometers (15-45 miles) of 600 to 1,200 pound test microfilament mainline per set. Mainlines are rigged with 22 meters branch lines at approximately 61 meters intervals and buoyed every 1.6 kilometers (1 mile) (Pacific Fishery Management Council 2003). Large squid (*Illex* spp.) are known to be used for bait, as well as various colored light sticks. The mainline is deployed in 4 to 7 hours and left to drift (unattached) for 7 to 10 hours. Fishing occurs primarily during the night when more swordfish are available in surface waters. Generally, longline gear targeting tuna is set in the morning at depths below 100 meters, and hauled in the evening. Longline gear targeting swordfish is set at sunset at depths less than 100 meters, and hauled at sunrise.

Longliners based out of the west coast of the U.S. fish outside of the EEZ. Under California and Washington law, longline fishing in the EEZ off California is prohibited. However, California registered vessels are allowed to land longline caught fish in California ports as long as fishing takes place outside of the EEZ. These vessels fish from California until about May, when the pattern of fishing moved to the west, and operating from Hawaii became more convenient. Consequently, beginning in the latter part of 1995, a number of vessels from the Hawaiian fleet began a pattern of fishing operations that moved to California in the fall and winter and then back to Hawaii in the spring and summer. This pattern continued until 2001, when the swordfish targeting prohibition and other restrictions were implemented for Hawaii vessels. Because of the prohibition, about 20 vessels removed themselves from their western Pacific longline limited entry permit and shifted to California.

In November 2002, the Pacific Fishery Management Council adopted a proposed FMP that would have allowed West Coast longline vessels to target swordfish in waters east of 150° West longitude. Based on a detailed analyses of observer data in both the West Coast- and Hawaii-based longline fleets, NMFS expressed concern that this fishery was expected to take more loggerhead and leatherback turtles than previously authorized in other fisheries. In March 2003, NMFS presented this analysis at a joint work session of the Highly Migratory Species Plan Development Team, the Highly Migratory Species Advisory Subpanel, and the Highly Migratory Species Subcommittee of the Science and Statistical Committee. At the June 2003 Council meeting, the Southwest Region again presented the analysis of expected take rates in this fishery and indicated that these take levels for sea turtles exceeded those that the agency expected could be authorized under the ESA. Based on this concern, NMFS proposed prohibiting shallow sets east of the 150°W longitude to reduce the number of sea turtles that would be taken by the fishery as shallow sets have a higher interaction rate than deep sets. This prohibition is expected to shift fishery effort from the West Coast longline fishery to the Hawaii-based fishery. There have been no reported interactions with listed marine mammals with the West Coast longline fishery.

On March 11, 2004, NMFS published regulations to close the area east of 150°W longitude to shallow-set longline gear (69 FR 11540). Shallow-set longline gear typically fishes at depths less than 100 meters. Deep set longlining gear typically fishes at depths greater than 100 meters.

Literature Cited

National Marine Fisheries Service. 1997. Final Pacific Offshore Cetacean Take Reduction Plan. 501 West Ocean Boulevard, Suite 4200, Long Beach, CA 90802.

Pacific Fishery Management Council. 2003. *Final Environmental Impact Statement for U.S. West Coast Fisheries for Highly Migratory Species*. August.

14.0 APPENDIX 3

Measures implemented under the Highly Migratory Species (HMS) Fishery Management Plan (FMP)

This information was taken from the NMFS Biological Opinion, dated February 4, 2004. Regulations in place under the MMPA would be unchanged. The Take Reduction Team process would continue to be the principal mechanism for considering regulatory changes to meet MMPA requirements.

1. Owners and operators of vessels registered for use of longline gear may not use longline gear to fish for or target swordfish *(Xiphias gladius*) west of 150° W. long. and north of the equator (0° N. lat.).

2. A person aboard a vessel registered for use of longline gear fishing for HMS west of 150° W. long. and north of the equator (0° N. lat.) may not possess or deploy any float line that is shorter than or equal to 20 m (65.6 ft or 10.9 fm). As used here, float line means a line used to suspend the main longline beneath a float.

3. From April 1 through May 31, owners and operators of vessels registered for use of longline gear may not use longline gear in waters bounded on the south by 0° lat., on the north by 15° N. lat., on the east by 145° W. long., and on the west by 180° long.

4. From April 1 through May 31, owners and operators of vessels registered for use of longline gear may not receive from another vessel HMS that were harvested by longline gear in waters bounded on the south by 0° lat., on the north by 15° N. lat., on the east by 145° W. long., and on the west by 180° long.

5. From April 1 through May 31, owners and operators of vessels registered for use of longline gear may not land or transship HMS that were harvested by longline gear in waters bounded on the south by 0° lat., on the north by 15° N. lat., on the east by 145° W. long., and on the west by 180° long.

6. No light stick may be possessed on board a vessel registered for use of longline gear during fishing trips that include any fishing west of 150° W. long. and north of the equator (0° N. lat.). A light stick as used in this paragraph is any type of light emitting device, including any florescent glow bead, chemical, or electrically powered light that is affixed underwater to the longline gear.

7. When a conventional monofilament longline is deployed in waters west of 150° W. long. and north of the equator (0° N. lat.) by a vessel registered for use of longline gear, no fewer than 15 branch lines may be set between any two floats. Vessel operators using basket-style longline gear must set a minimum of 10 branch lines between any 2 floats when fishing in waters north of the equator.

8. Longline gear deployed west of 150° W. long. and north of the equator (0° N. lat.) by a vessel registered for use of longline gear must be deployed such that the deepest point of the main longline between any two floats, i.e., the deepest point in each sag of the main line, is at a depth greater than 100 m (328.1 ft or 54.6 fm) below the sea surface.

9. Owners and operators of longline vessels registered for use of longline gear may land or possess no more than 10 swordfish from a fishing trip where any part of the trip included fishing west of 150° W. long. and north of the equator (0° N. lat.).

10. Fishing vessels that use longline gear to catch managed species beyond the EEZ and east of 150 W. longitude are not prohibited from making shallow water sets of the type used to target swordfish and are not subject to the limitations of items 2, 6, 7, 8, and 9 above.

Drift Gillnet Controls

The proposed regulations would not affect the gear restrictions resulting from the Pacific Offshore Cetacean Take Reduction Plan established under the authority of the Marine Mammal Protection Act of 1972. These measures can be found at 50 CFR 229.31.

The proposed regulations would maintain, but under MSA authority, conservation and management measures now in place under the authority of the Endangered Species Act and the State of California Fish and Game Code as follows:

1. The maximum length of a drift gillnet on board a vessel shall not exceed 6,000 feet.
2. Up to 1,500 feet of drift gillnet in separate panels of 600 feet may be on board the vessel in a storage area.

Protected Resource Area Closures:

1. No person may fish with, set, or haul back drift gillnet gear in U.S. waters of the Pacific Ocean from August 15 through November 15 in the area bounded by straight lines connecting the following coordinates in the order listed:

(a) Pt. Sur at 36° 18.5' N. lat., to
(b) 34° 27' N. lat. 123° 35' W. long.;
(c) 34° 27' N. lat. 129° W. long.;
(d) 45° N. lat. 129° W. long., thence
(e) to the point where 45° N. lat. intersects the Oregon coast.

2. No person may fish with, set, or haul back drift gillnet gear in U.S. waters of the Pacific Ocean east of 120° W. long. during the months of June, July, and August, during a forecasted or occurring El Niño event off Southern California. The Assistant Administrator will publish a notification in the Federal Register that an El Niño event is occurring off, or is forecast for off, the coast of southern California and the requirement for time area closures in the Pacific loggerhead conservation zone. The notification will also be announced in summary form by other methods as the Assistant Administrator determines necessary and

appropriate to provide notice to the California/Oregon drift gillnet fishery. The Assistant Administrator will rely on information developed by NOAA offices that monitor El Niño events, such as NOAA's Coast Watch program, and developed by the State of California, to determine if such a notice should be published. The requirement for the area closures from June 1 through August 31 will remain effective until the Assistant Administrator issues a notice that the El Niño event is no longer occurring.

Mainland area closures:

The following areas off the Pacific coast are closed to driftnet gear:

1. Within the U.S. EEZ from the United States-Mexico International Boundary to the California-Oregon border from February 1 through April 30.

2. In the portion of the U.S. EEZ within 75 nautical miles (nm) from the mainland shore from the United States-Mexico International Boundary to the California-Oregon border from May 1 through August 14.

3. In the portion of the U.S. EEZ within 25 miles of the coastline from December 15 through January 31 of the following year from the United States-Mexico International Boundary to the California-Oregon border.

4. In the portion of the U.S. EEZ from August 15 through September 30 within the area bounded by line extending from Dana Point to Church Rock on Santa Catalina Island, to Point La Jolla.

5. In the portion of the U.S. EEZ within 12 nautical miles from the mainland shore north of a line extending west of Point Arguello to the California-Oregon border.

6. In the portion of the U.S. EEZ within the area bounded by a line from the lighthouse at Point Reyes, California to Noonday Rock, to Southeast Farallon Island to Pillar Point.

7. In the portion of the U.S. EEZ off the Oregon coast east of a line approximating 1000 fathoms as defined by the following coordinates:

42° 00' 00" N. lat. 125° 10' 30" W. long.
42° 25' 39" N. lat. 124° 59' 09" W. long.
42° 30' 42" N. lat. 125° 00' 46" W. long.
42° 30' 23" N. lat. 125° 04' 14" W. long.
43° 02' 56" N. lat. 125° 06' 57" W. long.
43° 01' 29" N. lat. 125° 10' 55" W. long.
43° 50' 11" N. lat. 125° 19' 14" W. long.
44° 03' 23" N. lat. 125° 12' 22" W. long.
45° 00' 06" N. lat. 125° 16' 42" W. long.
45° 25' 27" N. lat. 125° 16' 29" W. long.
45° 45' 37" N. lat. 125° 15' 19" W. long.

46° 04' 45" N. lat. 125° 24' 41" W. long.
46° 16' 00" N. lat. 125° 20' 32" W. long.

8. In the portion of the U.S. EEZ north of 46° 16' N. latitude (Washington coast).

Channel Islands area closures:

The following areas off the Channel Islands are closed to driftnet gear:

1. San Miguel Island closures.
   (a) Within the portion of the U.S. EEZ north of San Miguel Island between a line extending 6 nm west of Point Bennett and a line extending 6 nm east of Cardwell Point.
   (b) Within the portion of the U.S. EEZ south of San Miguel Island between a line extending 10 nm west of Point Bennett and a line extending 10 nm east of Cardwell Point.

2. Santa Rosa Island Closure. Within the portion of the U.S. EEZ north of San Miguel Island between a line extending 6 nm west from Sandy Point and a line extending 6 nm east of Skunk Point from May 1 through July 31.

3. San Nicolas Island closure. In the portion of the U.S. EEZ within a radius of 10 nm of 33° 16' 41" N. lat., 119° 34' 39" W. long. (west end) from May 1 through July 31.

4. San Clemente Island closure. In the portion of the U.S. EEZ within 6 nm of the coastline on the easterly side of San Clemente Island within a line extending 6 nm west from 33° 02' 16" N. lat., 118° 35' 27" W. long. and a line extending 6 nm east from the light at Pyramid Head