Supplemental Environmental Assessment
on the Effects of the Issuance of an Amendment to Scientific Research Permit No. 774-1714-06 [National Marine Fisheries Service (NMFS) Southwest Fisheries Science Center (SWFSC)] for Cetacean Studies

April 2008

I. Proposed Action: The National Marine Fisheries Service, Office of Protected Resources (NMFS PR), proposes to issue, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq*.), and the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq*.), an amendment to scientific research Permit No. 774-1714-06, held by the NMFS SWFSC (Responsible Party: Jeremy Rusin). The SWFSC requests an amendment to the permit to: 1) reorganize authorized takes to represent annual take numbers; 2) for three cetacean species, collapse takes of separate stocks to the species level; 3) increase the number of cetaceans harassed during aerial and vessel surveys, biopsy sampled, and/or tagged; 4) authorize the close approach during aerial and vessel surveys for photo-identification and biopsy sampling of Antarctic minke whales (*Balaenoptera bonaerensis*); 5) add four new cetacean categories for animals that are observed but not identifiable during surveys; 6) add the Southern Ocean to the location where 14 cetacean species/stocks may be harassed and/or sampled; and 7) authorize the satellite tagging of up to 50 non-listed killer whales (*Orcinus orca*) in Antarctic waters annually. The permit amendment, if issued, would be valid until the permit expires on June 30, 2009.

The vast majority of the proposed research methodologies and effects were analyzed in previous environmental assessments (EAs) for issuance of Permit No. 774-1714 in 2004 and subsequent amendments to the permit in 2005 and 2006 that are listed below. NMFS determined that a Supplemental EA (SEA) was warranted to address those portions of the proposed action that have a potential for environmental effect, in particular the requested increase in allowable take numbers for multiple species, the addition of Antarctic minke whales, and the inclusion of the Southern Ocean to areas of sampling and potential harassment for 14 cetacean species.

II. Related National Environmental Policy Act (NEPA) Documents

The following NEPA documents contain specific analyses relative to the proposed action and action area considered under this SEA. The proposed research methodologies and effects of these techniques were analyzed in the previous EAs listed below for the SWFSC's permit. While the proposed action includes increased takes of these activities for several cetacean species, only one research activity (satellite tagging of non-listed killer whales) would be new to the permit. The remaining research activities would occur as previously described and analyzed

in the following relevant EAs. The proposed action area for this SEA is a subset of the area analyzed under the original EA.

- *Environmental Assessment on the Effects of the Issuance of Eleven National Marine Fisheries Service Permitted Scientific Research Activities on Marine Mammal and Sea Turtle Species in the U.S. Territorial Waters and High Seas of the North Pacific Ocean (including the Gulf of Alaska and Bering Sea), Arctic Ocean (including the Chukchi Sea and Beaufort Sea), Southern Ocean (including waters off Antarctica), and Foreign Territorial Waters of Mexico (Gulf of California only), Canada, Russia, Japan and the Philippines* (NMFS 2004a). This was a batched EA which analyzed the issuance of the SWFSC's original permit, No. 774-1714 along with ten other research permits. The objective of the various permits was to collect information on the biology, foraging ecology, behavior, and communication of a variety of marine mammal and sea turtle species in the action area, with a focus on humpback whales (*Megaptera novaeangliae*) in the North Pacific. This EA described and analyzed the effects of research activities ranging from close approaches during aerial and vessel surveys for photo-identification to biopsy sampling and acoustic playbacks. Four alternatives were proposed: 1) no action; 2) authorizing the proposed activities except invasive sampling; 3) authorize all the proposed activities; and 4) retraction of all permits and no further issuance of permit requests. All but alternative 3 were found to be unsuitable because they would fail to provide critical information on the ecology and biology of marine mammals that would help conserve, manage, and recover these species. A Finding of No Significant Impact (FONSI) was signed June 30, 2004 based on the best available information suggesting that careful approaches to cetaceans, even repeated approaches, elicited only moderate to minimal reactions, and that most animals showed no observed change in behavior in response to biopsy sampling or tagging.

Between December of 2004 and July of 2005, two additional minor amendments were issued that did not require addition NEPA analysis, resulting in Permit Nos. 774-1714-01 and 774-1714-02. The first amendment (-01) reallocated a portion of authorized radio and satellite tagging takes to takes for crittercam tagging. The second amendment (-02) to the permit authorized the development of cell lines from genetic samples collected. Since then, SWFSC's permit has had two major amendments to authorize vessel surveys, biopsy, and/or tagging takes of cetacean species. The associated EAs for these amendments supported the 2004 finding that the research activities are not expected to significantly impact the environment, including marine mammals.

- *Supplemental Environmental Assessment on the Effects of the Issuance of Nine National Marine Fisheries Service Permit Actions for Scientific Research Activities on Marine Mammal Species in the U.S. Territorial Waters and High Seas of the Eastern, Central, and Western North Pacific Ocean, with a Primary Focus on the Waters Off Hawaii and from California Northward to Southeast Alaska (Including Gulf of Alaska and Aleutian Islands), and Including Foreign Territorial Waters of Japan* (NMFS 2005a). For issuance of the first amendment, No. 774-1714-03, a SEA was prepared that analyzed the effects of increasing the number of humpback whales biopsy sampled in the North Pacific under the SWFSC's permit. It concluded that biopsy sampling would not result in

more than short-term disturbance to individual animals and no significant cumulative effect of the request was expected. A FONSI was signed September 16, 2005.

Another major amendment to the permit was then required due to the ESA listing of Southern Resident killer whales (SRKW), resulting in issuance of Permit No. 774-1714-04.

- *Environmental Assessment on the Effects of the Issuance of Four National Marine Fisheries Service Scientific Research Permits and Three Permit Amendments on the Eastern North Pacific Southern Resident Killer Whale (Orcinus orca) and Other Marine Mammals in the U.S. Territorial Waters, Exclusive Economic Zones, and High Seas of the Eastern North Pacific Ocean along the Coast of the U.S. from Southeastern Alaska to Central California, and Coastal Inlets and Estuaries of These States* (NMFS 2006a). This batched EA was prepared as a result of the ESA listing of Southern Resident killer whales (SRKW). Although the Center was already authorized takes of killer whales, takes had to be re-analyzed for the listing of one stock and broken out between takes for listed SRKW versus transient, non-listed orcas. The proposed activities (close approach, biopsy sampling, and tagging) were expected to result only in short-term stress and discomfort to individual animals and no long-term, cumulative effects were anticipated. A FONSI was signed March 30, 2006.

Since 2006, the SWFSC's permit has also undergone two minor amendments (Nos. 774-1714-05 and 774-1714-06) that did not require additional analysis under NEPA. The fifth amendment (-05) revised wording of conditions in the permit for SRKW research for clarity. The sixth amendment (-06) changed the Principal Investigator on the permit due to staffing changes at the SWFSC.

The original permit and each major amendment listed above required Section 7 consultation which each resulted in a biological opinion (NMFS 2004b, 2005b, 2006b) for each that concluded that the proposed actions would not result in jeopardy to listed species. Each of the above EAs found that there would be no significant impact in the issuance of the proposed actions. This document serves as a supplement to the most recently prepared SEA (NMFS 2005a) as well as supplementing the portion of the March 2006 EA (NMFS 2006a) specific to permit No 774-1714 in order to address the potential environmental impacts of the present amendment request to Permit No. 774-1714-06.

The vast majority of the proposed research methodologies were previously analyzed under the past EAs for the SWFSC's permit. For brevity, where methodologies, anticipated environmental consequences and mitigation measures from the requested activities are the same as those previously discussed and analyzed, this SEA will summarize the information and analysis in those prior EAs and incorporate those portions of the relevant EA by reference. Where the proposed action differs from the previous EAs, this SEA will provide further information and analysis on those activities within this document. The potential cumulative effects of the currently authorized activities and the addition of the newly requested permit action since the most recent assessment will also be considered under this SEA.

III. Purpose and Need: The primary purpose of the NMFS scientific research and enhancement special exception permitting program is to authorize takes of marine animals and/or endangered species for scientific purposes, to provide a better understanding of their basic biology and ecology, and to evaluate the cause(s) of population decline in order to develop conservation and protective measures to ensure species recovery.

Federal Permits, Licenses and Entitlements

The need for the proposed action arises from several sources. First, NMFS has a responsibility to implement both the MMPA and ESA to conserve and recover threatened and endangered species under its jurisdiction, which includes the species contained in the proposed action. The MMPA and ESA prohibit takes[1] of marine animals. Both Section 10 of the ESA and Section 104 of the MMPA put forth a limited number of exceptions to the prohibitions on take, including for scientific research. Permit issuance criteria require that research activities are consistent with the purposes and polices of these Acts and that such activities would not have an adverse impact on the species or stocks. Hence, the Permit Holder is required to obtain an amendment to conduct the proposed research.

Endangered Species Act and Marine Mammal Protection Act

A moratorium on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas was established with passage of the MMPA in 1972. The MMPA provides that this moratorium on taking of marine mammals can be waived for specific purposes, if the taking will not disadvantage the affected species or stock. Section 104 of the MMPA allows for issuance of permits to take marine mammals for the purposes of scientific research or to enhance the survival or recovery of a species or stock. These permits must specify the number and species of animals that can be taken, and designate the manner (method, dates, locations, etc.) in which the takes may occur. Section 9 of the ESA, as amended, and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Permits to take ESA-listed species for scientific purposes (or for the purpose of enhancing the propagation or survival of the species) may be granted pursuant to Section 10 of the ESA and in accordance with NMFS' implementing regulations. Permit issuance criteria require that research activities are consistent with the purposes and policies of the MMPA and ESA. Since the target large whale species are marine mammals, and thus protected under the MMPA, and listed as endangered under the ESA, the applicant requires a permit in order to conduct such scientific research on these whales.

[1] Under the MMPA, "take" is defined as to "harass, hunt, capture, collect or kill, or attempt to harass, hunt, capture, collect or kill any marine mammal." "Harass" is further defined as "any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing a disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild [Level B harassment]." [16 U.S.C. 1362(18)(A)] The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

National Environmental Policy Act

NEPA was enacted in 1969 and requires consideration of environmental issues in federal agency planning and decision making. The procedural provisions of NEPA are provided in 40 CFR Parts 1500-1508, outlining federal agency responsibilities under NEPA. NOAA has published procedures for implementing NEPA in NOAA Administrative Order 216-6. This EA is prepared in accordance with the National Environmental Policy Act (NEPA), its implementing regulations, and NOAA 216-6. Note that scientific research permits are typically subject to a categorical exclusion, as described in NAO 216-6, however, NMFS initially prepared an EA for the original permit to provide a more detailed analysis of effects to ESA-listed species. Therefore, NMFS is considering the request for a major amendment to the permit a substantial change in the action, and is preparing a SEA in accordance with NEPA. This document evaluates the relevant effects of research activities involving close approach to cetacean species.

Scientific Research

A second reason for the proposed action is the need for additional information on the biology and ecology of cetaceans, particularly as it relates to populations that have been affected by human activities, population structure, and predator-prey interactions. Under the ESA, NMFS is responsible for the conservation and recovery of endangered and threatened marine mammals. Scientific research is an important means of gathering valuable information about these species and is necessary to conserve them and promote their recovery. The purposes of the proposed research are to 1) address conservation and management questions related to stock identification, abundance, and trends of protected and ESA-listed marine mammals; 2) aid investigations of the diets of killer whales in the Southern Ocean; 3) add to the SWFSC's genetic tissue archive samples from marine mammals in geographic areas for which there is little information for ongoing population structure studies; and 4) advance the understanding of the phylogenetic status of Antarctic killer whale ecotypes. This could result in the description of a new species and have important management implications for killer whales in the Antarctic.

IV. Alternatives Under Consideration: Two alternatives have been considered: (1) approving the permit amendment request, i.e. the proposed action; (2) not approving the requested permit amendment, i.e. the no action alternative.

A. Alternative 1--Description of the Proposed Action

The proposed action is issuance of an amendment to scientific research Permit No. 774-1714-06 (NMFS SWFSC), pursuant to the ESA and MMPA. The SWFSC's current permit authorizes stock assessment research activities for eight species of large whales, Southern Resident killer whales, beluga whales (*Delphinapterus leucas*), and various small cetaceans (Appendix 1). The authorized activities include aerial surveys, counts, and photography, vessel surveys (including transects and approaches for photography and biopsies), and tagging of cetaceans. All age and sex classes of cetaceans may be approached for surveys and photo-id. Adults and juveniles of all

species may be biopsy sampled as well as large whale calves at least six months old and females attending such calves. No calves of any age may be tagged. All cetacean species authorized for biopsy sampling and tagging are a subset of animals to be harassed during vessel surveys. The permit also authorizes the directed take of pinniped and sea turtles species during research surveys. Takes for these species can be found in the draft permit amendment. Please refer to the Action Area below for the location of authorized research. The permit expires June 30, 2009. The following section describes the requested amendment and how cetaceans would be approached, sampled, and tagged under the proposed permit amendment.

The SWFSC has requested a number of changes to their current permit. Some of these changes would clarify or simplify what the permit currently authorizes and do not involve additional takes of species or stocks. This includes a request to reorganize all currently authorized cetacean takes (Appendix 1) to represent annual takes (rather than 5-year totals). Current authorized takes for each species/stock would be divided by 5 to represent annual takes authorized by the 5-year permit. Another change that would not involve additional takes is a request to collapse takes of separate stocks that cannot be identified beyond the species level while in the field for three species: Dall's porpoise (*Phocoenoides dalli*), pantropical spotted dolphin (*Stenella attenuata*), and rough-toothed dolphin (*Steno bredanensis*). For each species, authorized annual takes for individual stocks would be summed together into a single row. In addition to the collapsed takes, increases in takes have been requested for some activities for these species as detailed in the following paragraphs. Please refer to Tables 1 and 2 for more details of these requested changes.

In terms of new takes, the Holder requests to increase the number of takes currently authorized for Level B activities (close approach during vessel and/or aerial surveys for photo-identification as well as incidental harassment) for 18 currently authorized cetacean species or stocks (see Activities below on pp. 7-8). The Permit Holder is also requesting to: 1) expand the geographic range to the whole Pacific Ocean and/or the Southern Ocean for 14 currently authorized species or stocks; 2) increase the number of biopsy samples that may be collected annually for 17 currently authorized species or stocks; 3) increase the number of animals that may be incidentally harassed for six currently authorized species or stocks (associated with increases in directed take); 4) and increase the number of animals that may be satellite tagged annually for short-finned pilot whales (*Globicephala macrorhynchus*), non-listed killer whales, and false killer whales (*Pseudorca crassidens*). Please refer to Tables 1 and 2 for more details of these requested changes.

In addition to the species and stocks currently authorized by the permit, the SWFSC is requesting to add one species and two stocks of whales in the Southern Ocean: Antarctic minke whales, humpback whales, and sperm whales (*Physeter macrocephalus*). They are requesting takes for the close approach during aerial and vessel surveys and biopsy sampling of Antarctic minke whales and the close approach, biopsy sampling, and tagging of humpback and sperm whales. Takes of humpback and sperm whales stocks in the Southern Ocean would be a reallocation of a portion of the takes currently authorized in the North Pacific rather than an increase in the total number of takes authorized for the species worldwide. The SWFSC is also requesting to add four new cetacean categories for the close approach and biopsy sampling of observable but not identifiable animals during surveys: unidentified common dolphin, unidentified dolphin,

unidentified rorqual, and unidentified pilot whale. This would allow researchers to more accurately keep track of and report takes used during field work but is not expected to be an effective increase in takes for these species. Please refer to Tables 1 and 2 for more details of these requested changes.

Action Area

Although the Permit Holder is requesting a change in location for several authorized species/stocks, the overall action area described and analyzed for the current permit would not change. Activities are authorized to occur in the U.S. EEZ waters of the North Pacific Ocean (CA, OR, WA, HI, AK), ETP waters, Arctic Ocean, Southern Ocean and international waters. The ETP is comprised of approximately 21 million km^2 of ocean between the U.S.-Mexico border, Hawaii, and Peru, and includes a number of oceanographically distinct regions, including the Equatorial Cold Tongue, and the eastern Pacific Warm Pool (between Central America and 120º W, and between 25º N and 5º N). Takes of sperm and humpback whales would occur during ongoing killer whale research in the Southern Ocean, off of the Antarctic peninsula or in the Southern Ross Sea. The action area as described in the 2004 EA and the 2006 EA are incorporated by reference.

Activities

Except where described here, the proposed research activities would occur as previously described and analyzed in the past relevant EAs. This includes close approach during aerial and vessel surveys, photo-identification, biopsy sampling, tagging, and incidental harassment. All mitigation measures currently in the permit would remain in effect (See Section VII for more details).

Close Approach—Aerial and Vessel Surveys

The SWFSC is requesting the following increases in take by close approach during aerial and vessel surveys annually. Close approaches would occur in the same manner as previously described and analyzed (NMFS 2005a, 2006a) for the current permit. All of these takes represent an increase in take, except for sperm and humpback whales, which would be a reallocation of takes to new stocks rather than an increase. Asterisks denote newly requested species or stocks or geographic area.

Aerial Takes	Vessel Takes	Species/stock
100	100	Sperm whale, Southern Ocean*
100	100	Humpback whale, Southern Ocean*
100	100	Antarctic minke whale*
10	--	Arnoux's beaked whale, *Berardius arnuxii*
50	--	Pygmy right whale, *Caperea marginata*
--	300	Long-beaked common dolphin, *Delphinus capensis*
5,000	2,300	Short-beaked common dolphin, *Delphinus delphis*
1,500	--	Gray whale, *Eschrichtius robustus*
400	400	Short-finned pilot whale

100	--	Long-finned pilot whale, *Globicephala melas*
--	300	Risso's dolphin, *Grampus griseus*
40	--	Pygmy sperm whale, *Kogia breviceps*
40	--	Dwarf sperm whale, *Kogia simus*
200	--	Hourglass dolphin, *Lagenorhynchus cruciger*
2,400	950	Pacific white-sided dolphin, *Lagenorhynchus obliquidens*
1,900	400	Northern right whale dolphin, *Lissodelphis borealis*
800	450	Melon-headed whale, *Peponocephala electra*
20	--	Burmeister's porpoise, *Phocoena spinipinnis*
200	16	Shepherd's beaked whale, *Tasmacetus shepherdi*
--	80	Cuvier's beaked whale, *Ziphius cavirostris*
300	--	Killer whale, non-endangered stocks

Biopsy Sampling

The SWFSC is requesting the following increases in annual takes for biopsy sampling. This sampling would occur in the same manner as previously described and analyzed for the current permit. All of these takes represent an increase in take, except for sperm and humpback whales, which would be a reallocation of takes to new stocks rather than an increase. No animals less than six months of age or females attending such calves would be biopsy sampled.

Annual Takes	Species/stock
20	Sperm whale, Southern Ocean*
40	Humpback whale, Southern Ocean*
50	Antarctic minke whale*
10	Baird's beaked whale, *Berardius bairdii*
150	Long-beaked common dolphin
450	Short-beaked common dolphin
180	Short-finned pilot whale
80	Risso's dolphin
50	Pacific white-sided dolphin
40	Northern right whale dolphin
100	Melon-headed whale
800	Pantropical spotted dolphin, offshore, northeastern, and western/southern stocks
400	Pantropical spotted dolphin, coastal stock, *Stenella attenuata grafmani*
300	Spinner dolphin, white belly stock, *Stenella longirostris longirostris*
300	Spinner dolphin, eastern stock, *Stenella longirostris orientalis*
160	Rough-toothed dolphin
6	Shepherd's beaked whale
300	Bottlenose dolphin, *Tursiops truncatus*

Tagging—radio/TDR and satellite

The SWFSC is requesting the following increases in annual takes for tagging. The additional radio/TDR and satellite tagging would occur in the same manner with the same units previously described and analyzed for the current permit. All of these takes represent an increase in take, except for sperm and humpback whales, which would be a reallocation of takes to new stocks rather than an increase.

Radio/TDR	Satellite	Species/stock
--	5	Sperm whale, Southern Ocean*
5	5	Humpback whale, Southern Ocean*
--	4	Short-finned pilot whale
--	4	False killer whale

Incidental Harassment

The SWFSC is requesting the following increases in annual takes for incidental harassment of animals that would occur during research activities. This would occur in the same manner as previously described and analyzed for the current permit. All of these takes represent an increase in take, except for sperm and humpback whales, which would be a reallocation of takes to new stocks rather than an increase.

Annual Takes	Species/stock
100	Sperm whale, Southern Ocean*
100	Humpback whale, Southern Ocean*
100	Antarctic minke whale*
21,000	Short-beaked common dolphin
1,000	Gray whale
1,600	Short-finned pilot whale
4,000	Pacific white-sided dolphin
3,000	Northern right whale dolphin
160	Shepherd's beaked whale

Change in Geographic Area

The SWFSC is requesting a change in the specific area authorized for the following species/stocks within the overall action area previously described and analyzed for the current permit. Hence, these changes would not increase or change the overall Action Area for the permit. The majority of these changes are to add the Southern Ocean to the location of research and/or broaden the area of work in the North Pacific Ocean. The following list includes areas for new species/stocks that would be added to the permit.

Species/stocks

Sperm whale, Southern Ocean*	Cuvier's beaked whale
Humpback whale, Southern Ocean*	Bottlenose dolphin
Antarctic minke whale*	Rough-toothed dolphin
Short-beaked common dolphin	Spinner dolphin, white belly stock
Pygmy killer whale, *Feresa attenuata*	Striped dolphin, *Stenella coeruleoalba*

Short-finned pilot whale
Risso's dolphin
Pygmy sperm whale
Fraser's dolphin
False killer whale
Beaked whales, *Mesoplodon spp.*
Dwarf sperm whale

Invasive Satellite tagging—non-listed killer whales in the Antarctic

The only new research activity that has not been previously described and analyzed for the SWFSC's permit is a method of satellite tagging requested for non-listed killer whales in the Southern Ocean. The SWFSC is requesting to satellite tag up to 50 Antarctic killer whales annually using minimally invasive satellite tags. These tags would be different than the implantable tags currently authorized by the permit.

In order to quantify movement patterns and dive behavior of killer whales, satellite-linked transmitters and the Service Argos satellite system would be employed. Tag units would contain a satellite transmitter along with a time-depth recorder to determine foraging depth. Researchers would deploy tags from thick fast ice (up to 2 meters) on passing killer whales. Tag units would be approximately 6 cm x 3.5 cm x 2.5 cm and weigh approximately 50 grams with two barbed titanium or stainless steel darts (Figure 1). The transmitters would be deployed from a crossbow or an air gun with the darts imbedding, or implanting, into the dorsal fin less than 2 cm deep. Hence, only the two barbed darts would penetrate the fin; no other portion of the tag would be 'implanted' into the animal. The transmitters would send ultra-high frequency (UHF) (401.65 MHz) signals to Argos receivers on five NOAA TIROS-N weather satellites when animals surface. Tags have been known to transmit for up to 65 days, with an average longevity of 29 days before falling out of the fin.


Figure 1. Proposed satellite tag for Antarctic killer whale research.

Attempts to tag an animal would be abandoned if the animal exhibits moderate to strong reactions (e.g. breaching, repetitive tail slaps, etc.) to close approaches or it continually exhibits evasive behaviors. Tagging takes would occur during the vessel surveys for photo-identification and behavioral observations. Adult animals would be targeted for tagging; however, no females with young calves (<6 months) would be tagged. No animals would be captured or restrained in the tagging process.

In addition to the description of activities provided here and the following proposed take tables, the permit amendment would contain mitigating conditions which would minimize any potential effects of the proposed activities. (Please refer to Section VII for more details.)

Table 1. Proposed annual takes of large whales for Permit No. 774-1714-07. New or increased takes and changes in location appear in bold font. Current authorized takes (as five-year totals) for this permit can be found in Appendix 1.

Species **Common name (Scientific name)**	**Locations/ Stocks**	**Directed Annual Takes (includes collection of sloughed skin)**					**Harassment incidental to all research activities**
		Aerial	**Vessel surveys**		**Tagging**		
		Photo-grammetry 500 ft	**Biopsy**	**Photo ID**	**radio/ TDR**	**satellite**	
Bowhead whale *Balaena mysticetus*	North Pacific, Arctic Ocean	--	20	50	--	--	200
Sei whale *Balaenoptera borealis*	Pacific Ocean (U.S. EEZs and ETP)	200	100	200	25	25	1,000
Blue whale *Balaenoptera musculus*	Pacific Ocean (U.S. EEZs and ETP)	200	100	200	25	25	1,000
Fin whale *Balaenoptera physalus*	Pacific Ocean (U.S. EEZs and ETP)	200	100	200	25	25	1,000
Southern right whale *Eubalaena australis*	Southern Hemisphere	--	10	20	--	--	200
Northern right whale *Eubalaena japonica*	North Pacific	20	10	20	4	4	20
Sperm whale *Physeter macrocephalus*	Pacific Ocean (U.S. EEZs and ETP)	**900**	**80**	**100**	**25**	**20**	**900**
Sperm whale *Physeter macrocephalus*	**Southern Ocean or Pacific Ocean (U.S. EEZs and ETP)***	**100**	**20**	**100**	**--**	**5**	**100**
Humpback whale *Megaptera novaeangliae*	Pacific Ocean (U.S. EEZs and ETP)	**100**	**260**	**500**	**18**	**17**	**900**
					5 may be crittercams		
Humpback whale *Megaptera novaeangliae*	**Southern Ocean or Pacific Ocean (U.S. EEZs and ETP)***	**100**	**40**	**100**	**5**	**5**	**100**

Vaquita *Phocoena sinus*	Gulf of California	50	10	20	--	--	200

***In the event that the Permit Holder is unable to use authorized takes for humpback or sperm whales in the Southern Ocean, researchers could use these takes in the Pacific Ocean as identified in Table 1. Annual reports must clearly identify where these takes are used.**

Table 2. Proposed annual takes of other non-listed cetaceans for Permit No. 774-1714-07. Requested new or increased takes and changes in location appear in bold font. Current authorized takes (as five-year totals) for this permit can be found in Appendix 1.

Species **Common name (Scientific name)**	**Locations/ Stocks**	**Directed Annual Takes (includes collection of sloughed skin)**					**Incidental harassment for all research activities**
		Aerial Photo-grammetry 500 ft	**Vessel surveys**		**Tagging**		
			Biopsy	**Photo ID**	**radio/ TDR**	**satellite**	
Minke whale *Balaenoptera acutorostrata*	Pacific Ocean (U.S. EEZs and ETP)	200	100	200	--	--	1,000
Antarctic minke whale *Balaenoptera bonaerensis*	**Southern Ocean**	**100**	**50**	**100**	**--**	**--**	**100**
Bryde's whale *Balaenoptera edeni*	Pacific Ocean (EEZs and ETP)	200	100	200	25	25	1,000
Arnoux's beaked whale *Berardius arnuxii*	Southern Ocean	**10**	10	20	--	--	200
Baird's beaked whale *Berardius bairdii*	North Pacific	100	**20**	20	25	25	1,000
Pygmy right whale *Caperea marginata*	Southern Ocean	**50**	10	20	--	--	200
Commerson's dolphin *Cephalorhynchus commersonii*	coasts of South America	--	10	20	--	--	200
Chilean dolphin *Cephalorhynchus eutropia*	coast of Chile	--	10	20	--	--	200
Hector's dolphin *Cephalorhynchus hectori*	coastal waters of New Zealand	--	20	20	--	--	200
Beluga whale *Delphinapterus leucas*	North Pacific, North Atlantic	200	50	50	--	--	1,000
Long-beaked common dolphin *Delphinus capensis*	Pacific Ocean (U.S. EEZs and ETP)	10,000	**200**	**500**	**--**	**--**	20,000

Species **Common name (Scientific name)**	**Locations/ Stocks**	**Directed Annual Takes (includes collection of sloughed skin)**					**Incidental harassment for all research activities**
		Aerial Photo-grammetry 500 ft	**Vessel surveys**		**Tagging**		
			Biopsy	**Photo ID**	**radio/ TDR**	**satellite**	
Short-beaked common dolphin *Delphinus delphis*	Pacific Ocean, **Southern Ocean**	**15,000**	**500**	**2,500**	--	--	**25,000**
Gray whale *Eschrichtius robustus*	Eastern North Pacific	**2,000**	50	200	--	--	**2,000**
Pygmy killer whale *Feresa attenuata*	**Pacific Ocean, Southern Ocean**	200	20	100	--	--	1,000
Short-finned pilot whale *Globicephala macrorhynchus*	**Pacific Ocean, Southern Ocean**	**500**	**200**	**500**	--	**10**	**2,000**
Long-finned pilot whale *Globicephala melas*	Southern Ocean	**100**	20	100	--	--	400
Risso's dolphin *Grampus griseus*	**Pacific Ocean, Southern Ocean**	1,000	**100**	**500**	--	--	1,000
Southern bottlenose whale *Hyperoodon planifrons*	Southern Ocean	--	10	20	--	--	200
Longman's beaked whale *Indopacetus pacificus*	Indian Ocean, Pacific Ocean	--	10	20	--	--	200
Pygmy sperm whale *Kogia breviceps*	**Pacific Ocean, Southern Ocean**	**50**	20	20	--	--	200
Dwarf sperm whale *Kogia simus*	**Pacific Ocean, Southern Ocean**	**50**	20	20	--	--	200
Fraser's dolphin *Lagenodelphis hosei*	**Pacific Ocean, Southern Ocean**	1,000	20	200	--	--	2,000
Peale's dolphin *Lagenorhynchus australis*	South American Coasts	--	10	20	--	--	1,000
Hourglass dolphin *Lagenorhynchus cruciger*	Southern Hemisphere	**200**	10	20	--	--	1,000
Pacific white-sided dolphin *Lagenorhynchus obliquidens*	North Pacific	**3,000**	**100**	**1,000**	--	--	**6,000**

Species **Common name (Scientific name)**	**Locations/ Stocks**	**Directed Annual Takes (includes collection of sloughed skin)**					**Incidental harassment for all research activities**
		Aerial Photo-grammetry 500 ft	**Vessel surveys**		**Tagging**		
			Biopsy	**Photo ID**	**radio/ TDR**	**satellite**	
Dusky dolphin *Lagenorhynchus obscurus*	Southern Hemisphere	--	10	20	--	--	1,000
Northern right whale dolphin *Lissodelphis borealis*	North Pacific	**2,000**	**50**	**500**	--	--	**5,000**
Southern right whale dolphin *Lissodelphis peronii*	Southern Hemisphere	--	10	20	--	--	1,000
Beaked whales *Mesoplodon* spp.	**Southern Ocean** Pacific Ocean (U.S. EEZs and ETP)	100	50	100	--	--	1,000
Melon-headed whale *Peponocephala electra*	Southern Ocean Pacific Ocean (U.S. EEZs and ETP)	**1,000**	**150**	**500**	--	--	1,000
Spectacled porpoise *Phocoena dioptrica*	Southern Hemisphere	--	10	20	--	--	200
Harbor porpoise *Phocoena phocaena*	North Pacific, North Atlantic	200	20	50	--	--	1,000
Burmeister's porpoise *Phocoena spinipinnis*	South American Coasts	**20**	10	20	--	--	200
Dall's porpoise *Phocoenoides dalli*	North Pacific **(U.S. West Coast stocks)**	400	100	400	--	-- B	4,000
False killer whale *Pseudorca crassidens*	Southern Ocean **Pacific Ocean**	500	100	200	--	**10**	1,000
Pantropical spotted dolphin *Stenella attenuata*	Pacific Ocean **(offshore, northeastern, western/southern stocks)**	20,000	**1,000**	2,000	--	--	80,000
Pantropical spotted dolphin *Stenella attenuata grafmani*	Pacific Ocean (U.S. EEZs and ETP) (coastal stock)	10,000	**500**	1,000	--	--	40,000
Striped dolphin *Stenella coeruleoalba*	**Pacific Ocean, Southern Ocean**	5,000	100	1,000	--	--	20,000

Species **Common name (Scientific name)**	**Locations/ Stocks**	**Directed Annual Takes (includes collection of sloughed skin)**					**Incidental harassment for all research activities**
		Aerial Photo-grammetry 500 ft	**Vessel surveys**		**Tagging**		
			Biopsy	**Photo ID**	**radio/ TDR**	**satellite**	
Spinner dolphin *Stenella longirostris longirostris*	**Pacific Ocean** (white belly stock), **Southern Ocean**	10,000	**400**	1,000	--	--	40,000
Spinner dolphin *Stenella longirostris orientalis*	Pacific Ocean (U.S. EEZs and ETP) (eastern stock)	10,000	**400**	1,000	--	--	40,000
Spinner dolphin *Stenella longirostris centroamericana*	Pacific Ocean (U.S. EEZs and ETP) (Central American stock)	10,000	100	1,000	--	--	40,000
Rough-toothed dolphin *Steno bredanensis*	**Pacific Ocean, Southern Ocean**	500	**200**	200	--	--	2,000
Shepherd's beaked whale *Tasmacetus shepherdi*	Southern Ocean	**200**	**10**	**20**	--	--	**200**
Bottlenose dolphin *Tursiops truncatus*	**Pacific Ocean, Southern Ocean**	5,000	**400**	1,000	--	--	20,000
Cuvier's beaked whale *Ziphius cavirostris*	**Pacific Ocean, Southern Ocean**	500	20	**100**	--	--	1,000
Unidentified common dolphin *Delphinus* spp.	**Pacific Ocean, Southern Ocean**	**200**	**50**	**200**	**--**	**--**	**200**
Unidentified delphinid *Delphinidae* spp.	**Pacific Ocean, Southern Ocean**	**100**	**50**	**100**	**--**	**--**	**100**
Unidentified rorqual *Balaenopteridae* spp.	**Pacific Ocean, Southern Ocean**	**100**	**50**	**50**	**--**	**--**	**100**
Unidentified pilot whale *Globicephala* spp.	**Pacific Ocean, Southern Ocean**	**100**	**50**	**100**	**--**	**--**	**100**
Killer whale (eastern North Pacific Southern Resident) *Orcinus orca*	North Pacific	--	10	20	--	--	20

Species **Common name (Scientific name)**	**Locations/ Stocks**	**Directed Annual Takes (includes collection of sloughed skin)**					**Incidental harassment for all research activities**
		Aerial Photo-grammetry 500 ft	**Vessel surveys**		**Tagging**		
			Biopsy	**Photo ID**	**radio/ TDR**	**satellite**	
Killer whale (non-listed stocks) *Orcinus orca*	S. Hemisphere, Pac. Ocean (U.S. EEZ and ETP)	**300**	130	180	--	**50***	1,000

***Satellite tagging of non-listed killer whales would only be conducted in Antarctic waters.**

B. No Action: An alternative to the proposed action is no action, i.e., denial of the permit amendment request. Under this scenario, research would continue to occur as authorized under Permit No. 774-1714-06 but no additional takes or changes to takes would be issued. This alternative would eliminate any potential risk to the environment from the proposed research activities. However, it would not allow the research to be conducted and the opportunity would be lost to collect information that would contribute to better understanding marine mammal populations and provide information to NMFS that is needed to implement NMFS management activities and develop stock assessments.

V. Description of Affected Environment: This section describes the resources that may be affected by the proposed action.

ESA Listed Species Under NMFS Jurisdiction: The affected environment of the proposed action would include the following large whale species that are listed as endangered under the ESA. All marine mammals stocks/species listed under the ESA are also considered depleted under the MMPA. The following species' descriptions are updated to incorporate information about Southern Ocean stocks.

Endangered

Humpback whale	*Megaptera novaeangliae*
Sperm whale	*Physeter macrocephalus*

Both of these whales appear in Appendix I of CITES. The following is a brief summary of the status and occurrence of targeted and potentially affected marine mammal species in the proposed study areas. Descriptions of the status of these species can be found in the biological opinion that accompanies this document as well as the NMFS Recovery Plans for most of these species. A brief update to the most recent plans for each species has been provided.

Humpback whale: The humpback whale is ubiquitous in the world's oceans occurring from the tropics to the polar regions; however, it is currently listed as endangered under the ESA, and, in

international waters, all humpback whale stocks are designated as protected stocks by the International Whaling Commission (IWC) (Perry et al. 1999).

In the Southern Ocean, humpback whales feed primarily on Antarctic krill in colder waters during spring, summer, and autumn, and then migrate to winter ranges in tropical seas, where they calve and breed. It is estimated that 100,000 humpback whales inhabited the southern hemisphere prior to the onset of commercial whaling (Gambell 1976). Commercial whaling fleets took at least 208,000 humpback whales prior to the IWC's ban on humpback whaling in the southern hemisphere in 1963. Additionally, Soviet fleets illegally took large numbers of humpback whales in the southern hemisphere from the 1950s to the early 1970s. Currently, the best available information using surveys done as recently as 2003/4, estimates that there are at least a total of 50,000 humpbacks whales in the Southern Ocean, increasing annually at a rate of 9.6% (Branch 2007). While some humpback stocks have recovered quickly from commercial whaling, the species' IUCN Vulnerable listing is based on the stocks' failure to reach levels equal to 80% of abundance estimates for the 1930s (three generations ago, assuming a generation time of 20 years) (Reeves et al. 2003). The IWC recognizes seven breeding stocks (A-G) in the Southern Ocean. Based on the location of fieldwork, NMFS expects that animals from stocks E, F, or G would be targeted for research. Abundance estimates indicate that these stocks have approximately 9,840, 1,057, and 6,273 animals, respectively (Branch 2007). Today, threats to humpback populations include noise disturbance, ship strike, and fisheries interactions, such as entanglement (Perry et al. 1999).

Sperm whale

The sperm whale is classified as endangered under the ESA and the IUCN Red List List and therefore all stocks of sperm whales are classified as depleted under MMPA. Sperm whales are distributed from the tropics to the polar regions.

The IWC recognizes nine divisions of sperm whales in the Southern Ocean. Primarily males are found in the waters south of 60°S during the austral summer, feeding on fish and cephalopods. There are no reliable estimates of the current population size in the Antarctic; however, some data suggests there are approximately 14,000 individuals, most likely males (Perry et al. 1999). Historical whaling catch data suggests that over 500,000 sperm whales may have populated the Southern Ocean in the 1940's (Perry et al. 1999). While these populations have largely declined due to past reported and unreported whaling, they continue to be threatened by entanglement in fishing gear, pollution, habitat degradation, predation, and whale watching.

MMPA-Depleted Marine Mammal Species

Under the MMPA, a stock is designated as depleted when it falls below its optimum sustainable population. The MMPA defines optimum sustainable population as "the number of animals which would result in the maximum productivity of the population or the species, keeping in mind the optimum carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element" (16 U.S.C. 1362). NMFS regulations have further defined optimum sustainable population as "a population size, which falls within a range from [the carrying capacity of the] ecosystem to the population level that results in maximum net productivity." Once stocks have been designated as depleted, a conservation plan is developed to guide

research and management actions to restore the population. All marine mammals stocks/species listed under the ESA are also considered depleted under the MMPA. However, some marine mammal stocks have only been designated by NMFS as depleted under the MMPA, including the following target species: Eastern spinner dolphins (*Stenella longirostris orientalis*), pantropical spotted dolphins, northeastern offshore stock (*Stenella attenuata*), and the AT1 transient population of killer whales. Research activities contained under the proposed action for these species would range from photo-identification and behavioral observation to biopsy sampling and captures for tagging. Details on the distribution, abundance, productivity and annual human-caused mortality for each stock of these species can be found in the U.S. Pacific and Alaska Marine Mammal Stock Assessment Reports, which are available in PDF from the NMFS website (http://www.nmfs.noaa.gov/pr/). A review of the status of these stocks indicated that their depleted status has not changed. In addition, a description of the AT1 stock is incorporated by reference to the 2006 EA.

Spinner dolphin, eastern stock: Spinner dolphins are distributed in tropical and subtropical waters worldwide (Perrin and Gilpatrick 1994) and are most abundant in warm, tropical waters (Wade and Gerrodette 1993). Spinners are an offshore, deep water species. In the ETP, the three currently recognized stocks of spinner dolphins are the white belly, the eastern, and the Central American. (Perrin 1990; DeMaster and Sisson 1992). The eastern stock is endemic to the ETP (Perrin 1990). Because the estimated abundance level in 1979 was 62% greater than the average abundance estimate between 1986 and 1990, the NMFS has concluded that currently the eastern spinner dolphin should be considered depleted under the MMPA but determined that listing this stock as threatened under the ESA was not warranted. An estimate of 631,800 was produced for the eastern stock in the ETP (Wade and Gerrodette 1993).

Pantropical spotted dolphin, northeastern offshore stock: Pantropical spotted dolphins are primarily found in tropical and subtropical waters worldwide (Perrin and Hohn 1994). In the ETP, three stocks of spotted dolphins are currently recognized: the coastal stock and two offshore stocks, the northeastern stock and the western/southern stock and (Perrin et al. 1991; DeMaster and Sisson 1992; Dizon et al. 1992). Wade and Gerrodette (1993) estimated that the northeastern stock consisted of 730,900 individuals. Gerrodette and Palacios (1996) estimated abundance of pantropical spotted dolphins in the EEZ waters of the ETP to be approximately 383,600 animals. In these waters, pantropical spotted dolphins are likely to interact with coastal gillnet fisheries, but quantitative information on such interactions is not available. There are many areas into which this species' range likely extends, such as the central South Pacific, the central Indian Ocean and along the Atlantic coasts of South Africa and South America, but currently there is little information on this species in these areas. In the Indian Ocean, Leatherwood and Reeves (1989) suggested this species is abundant, but population estimates are not available and their status is unknown in these waters.

Other Targeted Marine Mammal Species Not Listed under the ESA or as Depleted Under the MMPA

Takes for several marine mammal species (identified below) that are not listed under the ESA or depleted under the MMPA have been requested under the proposed action and have been considered under the SEA.

The Antarctic minke whale would be a new species to the permit and has not been previously described in past EAs for the permit.

Antarctic minke whale: The Antarctic minke whale is considered a protected stock by the IWC, and is listed in Appendix I of CITES. Commercial whalers did not take large numbers of Antarctic minke whales until the early 1970s, when stocks of blue, fin, sei, and humpback whales had been depleted. Therefore, the population seems to have recovered from exploitation better than other species in the Southern Ocean. Between 1957 and 1987, Japan and the Soviet Union reported taking 98,202 minke whales from Antarctic waters (Horwood 1990); over 14,000 of these whales were taken from their breeding grounds off Brazil between 1965 and 1985 (Zerbini et al. 1997). Though incomplete, a recent estimate of the population suggests that there were 268,000 Antarctic minke whales between 1991 and 1998 (Branch and Butterworth 2001). Currently, there are no reliable estimates for the size of this population. Although commercial whaling is not permitted in the Southern Ocean Sanctuary, Japan currently takes approximately 300 Antarctic minke whales per year under a scientific research permit.

The proposed action would also affect 29 currently authorized protected species/stocks:

Arnoux's beaked whale
Baird's beaked whale
Bottlenose dolphin*
Burmeister's porpoise
Cuvier's beaked whale*
Dwarf sperm whale*
False killer whale
Fraser's dolphin
Gray whale, eastern North Pacific stock
Hourglass dolphin
Long-beaked common dolphin
Long-finned pilot whale
Melon-headed whale
Mesoplodon beaked whales*
Northern right whale dolphin
Pacific white-sided dolphin
Pantropical spotted dolphin, coastal stock
Pygmy killer whale
Pygmy right whale
Pygmy sperm whale*
Risso's dolphin*
Rough-toothed dolphin
Shepherd's beaked dolphin
Short-beaked common dolphin*
Short-finned pilot whale*
Spinner dolphin, white belly stock
Striped dolphin*
Killer whale, non-listed stocks*
Pantropical spotted dolphins, western and southern offshore stocks

Details on the distribution, abundance, productivity, and annual human-caused mortality for these stocks/species can be found in the U.S. Pacific and Alaska Marine Mammal Stock Assessment Reports, which are available in PDF from the NMFS website (http://www.nmfs.noaa.gov/pr/). A description of each asterisked species is incorporated by reference to the 2006 EA. There are no similar stock assessments available for animals found in the Southern Ocean because this area is not within U.S. waters. However, a review of the status of these species indicated that their status under the MMPA and ESA has not changed. A brief description is provided for the remaining (unasterisked) species to update the analysis of affected species for this permit.

Arnoux's beaked whale: Arnoux's beaked whale is widely distributed in the Southern Ocean from the edge of the antarctic pack ice north to approximately 34°S (Balcomb 1989). Little is known about this species, but it is apparently not as numerous as the Baird's beaked whale (Balcomb 1989). No significant exploitation of this species has occurred.

Baird's beaked whale: The Baird's beaked whale is found in deep waters and along the continental slopes of the North Pacific Ocean, mainly north of 34°N in the west and 28°N in the east (Balcomb 1989). It also inhabits the seas adjacent to the North Pacific, namely the Bering Sea, the Okhotsk Sea, Sea of Japan, and the southern Gulf of California, Mexico (Balcomb 1989). They have been harvested and studied in Japan, but little is known about this species elsewhere (Balcomb 1989). In the U.S. waters of the eastern North Pacific, the following two stocks of Baird's beaked whales are recognized for management purposes under the MMPA: the California/Oregon/Washington stock and the Alaska stock. Reliable abundance estimates for these stocks are currently unavailable and there are insufficient data to determine population trends.

Burmeister's porpoise: Burmeister's porpoise occurs along both coasts of South America, in a range that extends from southern Brazil to northern Peru. There are no quantitative data on abundance, although this species is assumed to be numerous in southern South American coastal waters (Brownell and Clapham 2001). This porpoise is killed in fisheries in various areas of its range, including Peru, Chile, Argentina, Uruguay and Brazil (Brownell and Clapham 2001). However, takes are poorly documented in all areas and estimates of fishery-related mortality are not available. Too little is known about this species to determine its overall status.

False killer whale: The false killer whale is distributed in tropical and warm-temperate waters worldwide (Stacey et al. 1994). In the North Pacific this species is well known from Japan, Hawaii and the ETP. In U.S. Pacific waters, one stock of false killer whales, the Hawaiian stock, is recognized for management purposes under the MMPA. False killer whales occur around all the main Hawaiian Islands, but its presence round the Northwestern Hawaiian Islands has not yet been established (Nitta and Henderson 1993). Population estimates for this species have been made for Japanese waters (16,600 animals, Miyashita 1993) and the ETP (39,800 animals, Wade and Gerrodette 1993). An estimated 9 animals per year are seriously injured or killed by the Hawaiian longline fishery within the U.S. EEZ. The status of this species in Hawaiian waters relative to optimum sustainable population (OSP) is unknown (Carretta et al. 2007). An unknown number of false killer whales are known to be taken incidentally in fishing gear and opportunistically in directed fisheries for small cetaceans in various parts of their range (Anonymous 1992).

Fraser's dolphin: Fraser's dolphins can be found in tropical waters worldwide though little is known about this species (Perrin et al. 1994b; Jefferson and Leatherwood 1994). The extent of its range in the central and western Pacific, the Indian, and the Atlantic Oceans is poorly known (Perrin et al. 1994b). Only the ETP has been examined closely, and there the species has been found to have a broad and continuous distribution (Perrin et al. 1994b). The estimate of abundance for this species in the ETP is 289,300 Fraser's dolphins (CV = 0.335) (Wade and Gerrodette 1993). The level of direct human-caused mortality is unknown. The status of this stock relative to OSP is unknown and insufficient data preclude determining population trends.

Threats to the species include various local subsistence harpoon fisheries in the Indopacific (Caldwell et al. 1976; Barnes 1991; Dolar 1994) and drive fisheries in Taiwan and Japan (Hammond and Leatherwood 1984) and tropical gillnet fisheries (Perrin et al. 1994b). There is little information on stock identity or population size and productivity (Reeves and Leatherwood 1994).

Gray whale, eastern stock: The only extant stocks of gray whales occur in the Pacific Ocean. The eastern Pacific stock spends the summer feeding in the northern Bering, Chukchi and Beaufort Seas (Rice and Wolman 1971). They winter mainly along the west coast of Baja California, where females give birth to their calves in certain bays and lagoons there from early January to mid-February (Rice et al. 1981). The population consists of at least 17,752 animals in the eastern North Pacific stock (Angliss et al. 2007). Threats to this stock include entanglement in commercial fisheries and subsistence hunting (Angliss et al. 2007). In 1999, NMFS convened a meeting at NMML on the status of gray whales since their de-listing from the ESA in 1994. It was decided at the meeting that this stock has continued to increase and is in no threat of becoming extinct (Angliss et al. 2007). Therefore, their status remains unlisted.

Hourglass dolphin: The hourglass dolphin is found in offshore waters primarily south of 40°S (Reeves et al. 2002). Little is know about this species as it is rarely sighted but when sighted has been seen in large groups of up to 100 animals (Reeves et al. 2002). No population trends or abundance information is available for this species.

Long-beaked common dolphin: The best available population estimate for this stock is 43,360 (Barlow 2003). This species is taken incidentally in some commercial fisheries. The status of long-beaked common dolphins relative to OSP is unknown, and there are insufficient data to evaluate potential trends in abundance for this species. Gerrodette and Palacios (1996) estimated the abundance of long-beaked common dolphins in the Pacific EEZ waters of Mexico from line-transect ship surveys which occurred between 1986 and 1993 to be approximately 211, 000 animals. Some animals are taken incidentally in gillnet fisheries in Sri Lanka (Leatherwood and Reeves 1989).

Long-finned pilot whale: The long-finned pilot whale has a discontinuous distribution in cold-temperate to subpolar waters of the North Atlantic and the Southern Ocean. Its aggregate abundance is thought to be at least in the hundred of thousands (Reeves and Leatherwood 1994). No population abundance or trends are available for animals in the Southern Ocean. The western North Atlantic stock is estimated to be 31,139 animals (Waring et al. 2007). The status of this stock relative to OSP is unknown and there are insufficient data to determine population trends. In the northeastern North Atlantic, long-finned pilot whales are estimated to number 750,000 animals based on sightings surveys in 1987 and 1989 (Buckland et al. 1993). Threats to the species include fishery-related mortality and subsistence hunting.

Melon-headed whale: Relatively little is known about the melon-headed whale, which is distributed in tropical to warm-temperate waters worldwide (Perryman et al. 1994). Large herds are seen regularly in Hawaiian waters (Shallenberger 1981). There is a single Pacific stock of melon-headed whales including only animals found in the U.S. EEZ of the Hawaiian Islands

(Carretta et al. 2007) with an estimated abundance of at least 154 whales (Mobley et al. 2000). The status of this stock relative to OSP is unknown.

Wade and Gerrodette (1993) produced an estimate of 45,400 melon-headed whales in the ETP. There are no estimates of abundance for this species throughout the rest of its range. Melon-headed whales have been killed in fisheries in several regions, but there is no evidence that these takes have had a significant impact on the species (Northridge and Pilleri 1986). Small numbers of melon-headed whale are taken incidentally in nets and directly in harpoon fisheries throughout the tropics (Caldwell et al. 1976; Leatherwood and Reeves 1989).

Northern right whale dolphin: The northern right whale dolphin is widely distributed in the cold-temperate North Pacific. Little information is available on the stock structure or population size of this species. The best estimated abundance for this stock is 20,362 animals (Barlow 2003). This stock is impacted by a commercial gillnet fishery in U.S. waters. This stock's status relative to OSP is unknown, and there are insufficient data to evaluate trends in abundance.

Pacific white-sided dolphin: The best available abundance estimate for Pacific white-sided dolphins in U.S. west coast waters is 59,274 animals (Barlow 2003). Pacific white-sided dolphins are incidentally caught in commercial drift gillnet and trawl fisheries (Carretta et al. 2007). The status of Pacific white-sided dolphins in California, Oregon and Washington relative to OSP is not known and there is no indication of a trend in abundance for this stock (Carretta et al. 2007). In the North Pacific stock the minimum abundance is estimated at 26,880 animals. Moderate numbers of Pacific white-sided dolphins are sometimes killed in foreign harpoon, gillnet, and drive fisheries throughout the species' range (Miyazaki 1983; Perkins et al. 1992; Kishiro and Kasuya 1993).

Pantropical spotted dolphin, coastal, western and southern offshore stocks: Pantropical spotted dolphins are primarily found in tropical and subtropical waters worldwide (Perrin and Hohn 1994). This species is found in both nearshore and oceanic waters (Reeves and Leatherwood 1994). Throughout the Hawaiian archipelago, these dolphins are common and abundant particularly in the channels between islands, over offshore banks (e.g. Penguin Banks), and off the lee shores of the islands (Shallenberger 1981). Morphological differences and distribution patterns have been used to establish that the spotted dolphins around Hawaii belong to a different stock that is distinct from those in the ETP (Perrin 1975; Dizon et al. 1994; Perrin et al. 1994a). Their possible affinities with other stocks in the Pacific are unknown. An abundance estimate of at least 2,928 pantropical spotted dolphins was calculated for animals in Hawaiian waters (Mobley et al. 2000). The overall status of pantropical spotted dolphins in Hawaiian waters relative to OSP is unknown.

In the ETP, three stocks of spotted dolphins are currently recognized: the coastal stock; and two offshore stocks, the northeastern stock and the western/southern stock and (Perrin et al. 1991; DeMaster and Sisson 1992; Dizon et al. 1992a). Wade and Gerrodette (1993) estimate that the western/southern stock has 1,298,400 individuals and the coastal stock consists of 29,800 individuals. Gerrodette and Palacios (1996) estimated abundance of pantropical spotted dolphins in the EEZ waters of the ETP to be approximately 383,600 animals. In these waters, pantropical

spotted dolphins are likely to interact with coastal gillnet fisheries, but quantitative information on such interactions is not available.

There are many areas into which this species' range likely extends, such as the central South Pacific, the central Indian Ocean and along the Atlantic coasts of South Africa and South America, but currently there is little information on this species in these areas. In the Indian Ocean, Leatherwood and Reeves (1989) suggested this species is abundant, but population estimates are not available and their status is unknown in these waters.

Pygmy killer whale: The pygmy killer whale is widely distributed in tropical and subtropical waters worldwide (Ross and Leatherwood 1994). They are poorly known in most parts of their range (Carretta et al. 2007). One stock of this species is recognized in the U.S. Pacific waters and it is the Hawaiian stock. There is no abundance estimate for them in nearshore Hawaiian waters. It is likely that pygmy killer whales occur in more pelagic waters, outside of the surveyed region (Carretta et al. 2007). The status of this stock is unknown relative to OSP.

Pygmy right whale: The pygmy right whale has a circumpolar distribution in temperate and subantarctic waters of the Southern Ocean (Baker 1985; Pavey 1992). There are no available population estimates for this species. It is one of the least known of all cetacean species but some data suggests it may exhibit seasonal movements (Reeves et al. 2002).

Rough-toothed dolphin: The rough-toothed dolphin is found in tropical and warm-temperate seas worldwide (Miyazaki and Perrin 1994). Its distribution is poorly known, but it is thought to occur in most, if not all, tropical and subtropical waters (Miyazaki and Perrin 1994). In the ETP, rough-toothed dolphins have been sighted throughout the area except in the coldest parts of the Peru and California currents, where it is absent. Most of the sightings occur in warmer water close to the Mexican coast (Wade and Gerrodette 1993). Wade and Gerrodette (1993) produced an abundance estimate of 145,900 rough-toothed dolphins in the ETP. A small number of these animals have been taken incidental to ETP tuna purse seine fishing operations.

Gerrodette and Palacios (1996) estimated the abundance of rough-toothed dolphins in the Pacific EEZ waters of Mexico, Central America, Costa Rica, Panama, and Columbia to be approximately 62,500 animals. Rough-toothed dolphins are present around all the main Hawaiian Islands (Shallenberger 1981; Tomich 1986) and have been observed at least as far northwest as the French Frigate Shoals (Nitta and Henderson 1993). Nothing is known about stock structure for this species in the North Pacific (Carretta et al. 2007). Mobley et al. (2000) estimated an abundance estimate of 123 Hawaiian rough-toothed dolphins. A small number of rough-toothed dolphins are incidentally taken in gillnet and driftnet fisheries in the central North Pacific. The overall status of rough-toothed dolphins in Hawaiian waters is unknown and its status relative to OSP is also unknown. Currently, there is no information on abundance of rough-toothed dolphins in the Indian Ocean, and their status in these waters is unknown. Small number of rough-toothed dolphins are incidentally taken in gillnet and driftnet fisheries in Sri Lanka and in directed fisheries (Prematunga et al. 1986; Leatherwood and Reeves 1989).

Shepherd's beaked dolphin: Although considered an offshore species, little is know about Shepherd's beaked dolphin (Reeves et al. 2002). Some data suggests that its range includes cold

temperate waters of the Southern Hemisphere (Reeves et al. 2002). No population trends or abundance information is available for this species.

Spinner dolphin, white belly stock: Spinner dolphins are distributed in tropical and subtropical waters worldwide (Perrin and Gilpatrick 1994) and are most abundant in warm, tropical waters (Wade and Gerrodette 1993). Spinners are an offshore, deep water species. In the ETP, the three currently recognized stocks of spinner dolphins are the white belly, the eastern, and the Central American. (Perrin 1990; DeMaster and Sisson 1992).

The white belly stock is considered a hybrid between the eastern spinner stock and the pantropical spinner dolphin, *S. l. longirostris* (Perrin 1990). An estimate of 1,019,300 was produced for the white belly stocks in the ETP (Wade and Gerrodette 1993). The white belly spinner dolphin has shown no detectable trends in abundance (Anganuzzi et al. 1992; Wade and Gerrodette 1993). This stock is considered to be in the range of OSP. Data are not available for Central American spinner dolphins, but because it has not been exploited to any great extent by the tuna purse seine fishery, there is no reason to expect it to be below OSP.

Biological Environment--non-target species

In addition to the target species, a variety of marine species (fish, sea birds, sea turtles, etc.) can be found within the action area and were considered under this SEA. The SWFSC's permit currently authorizes the incidental harassment of sea turtles and most marine mammals in the action area. The proposed additional research activities would occur as part of ongoing research cruises that are currently authorized by the SWFSC's permit. The previous EAs and accompanying biological opinions found that no non-target species would be significantly impacted by these research cruises. Given that the additional proposed research activities would occur during these cruises and that researchers would not attempt to approach or interact with other non-target species, NMFS does not expect that such animals would be impacted by the proposed action. In addition, a Section 7 consultation was initiated for the proposed action for which the results are discussed in the following section.

Physical Environment

The SWFSC's permit currently authorizes activities to occur in the U.S. EEZ waters of the North Pacific Ocean (CA, OR, WA, HI, AK), ETP waters, Arctic Ocean, Southern Ocean, and international waters. Although the Permit Holder is requesting a change in location for several species/stocks, the overall action area described and authorized for the current permit would not change.

In addition to the previous description of the Action Area, critical habitat was designated for Southern Resident killer whales (SRKW) in the North Pacific in 2006 since the issuance of the last major amendment to the permit (No. 774-1714-04). Though the proposed amendment would not affect this habitat, it is described here since it is part of the action area (North Pacific Ocean) of the permit.

Southern Resident Killer Whale Critical Habitat

Critical habitat for SRKW pods J, K, and L was designated on November 29, 2006 (71 FR 69054) in the northwest U.S. Critical habitat includes: 1) the Summer Core Area in Haro Strait and waters around the San Juan Islands; 2) Puget Sound; and 3) the Strait of Juan de Fuca, comprising approximately 2,560 square miles of marine habitat. The designation of this habitat was based on the following Primary Constituent Elements (PCEs): 1) water quality to support growth and development; 2) prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth; and 3) passage conditions to allow for migration, nesting, and foraging. NMFS does not expect that the proposed amendment will affect the PCEs of this habitat since the additional proposed research would not target SRKW and work would occur as part of the SWFSC's currently authorized research cruises. Therefore, no new impacts to the environment would be expected.

Social and Economic Environment

The social and economic effects of the proposed action mainly involve the effects on the people involved in the research, as well as any industries that support the research, such as charter vessels and suppliers of equipment needed to accomplish the research. Because the proposed activities would occur as part of currently authorized research cruises, NMFS does not expect there to be any significant social or economic impacts of the proposed action interrelated with significant natural or physical environmental effects. Thus, the SEA does not include any further analysis of social or economic effects of the proposed action.

VI. Environmental Consequences

This section presents a discussion of the potential environmental impacts of issuing an amendment to scientific research Permit No. 774-1714-06. The issue most relevant to the analysis of alternatives is the potential for negative impacts on wildlife within the proposed action area. However, it is important to recognize that an adverse effect on a single marine mammal or a small group of marine mammals does not translate into an adverse effect on the population or species *unless* that adverse effect results in reduced reproduction or survival that causes an appreciable reduction in the likelihood of survival or recovery for the species. Therefore, in order for the proposed action to have an adverse effect on a species, the exposure of individual animals of a given species to the research activities would first have to result in direct mortality or serious injury that would result in mortality of the exposed individual, or disrupt essential behaviors of the exposed individual, such as feeding, mating, or nursing, to a degree that the individual's likelihood of successful reproduction or survival was substantially reduced. Second, that mortality of an individual or substantial reduction in the individual's likelihood of successful reproduction or survival would have to result in a net reduction in the number of individuals of its species. In other words, the loss of the individual or its future offspring would not be offset by the addition, through birth or emigration, of other individuals into the population. Third, that net loss to the species would have to be reasonably expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of the listed species in the wild.

Whether or not a marine organism may be affected by the proposed action is dependent on two factors. The first factor is whether or not the organism is likely to be present within the action area at the time of the research. Some marine organisms are only in the action area at certain times of year, others may only be present at certain times of day. The second factor is whether or not the organism, when exposed to research activities, will respond. Response can take a variety of forms ranging from overt changes in behavior to less obvious, even undetectable, physiological changes such as elevated levels of hormones associated with stress. In the case of obvious behavioral reactions, the researchers would be able to detect them and the permits would contain conditions appropriate to minimize or mitigate such reactions. While physiological changes may not be immediately obvious unless they result in acute symptoms, if they are chronic or persistent, they tend to result in detectable symptoms over time such as illness or reduced reproduction. Thus far, marine mammal research has not been directly attributed to any population-level changes. In addition, other marine mammal species have been the subject of similar research activities, and studies on the effects of the research have not implicated research as a factor in reduced reproduction or overall fitness.

The research activities under the proposed action involve close approaches during aerial and vessel surveys for photo-identification, photogrammetry, behavioral observations, tagging, biopsy sampling, and tracking as well as the incidental harassment of cetacean species. Any impacts of the proposed activities would be limited to the biological environment and more specifically, to the target species/stocks of the permit. No mortalities would be expected from the proposed activities. Non-target species are not expected to be impacted by the proposed activities beyond the incidental harassment currently authorized for species identified in the SWFSC's current permit, No. 774-1714-06. Hence, the following analysis of environmental consequences focuses on the potential impacts of the proposed action for takes of the target species as outlined in the proposed action. In addition, the research activities proposed in the permit amendment request would be unlikely to affect the physical or socioeconomic environment, pose a risk to public health and safety, or affect any critical habitat beyond that previously analyzed for the current permit.

Environmental Consequences to the Biological Environment-Cetaceans

For the SWFSC permit, the **relevant past assessments** are NMFS 2004a, 2005a, and 2006a, The vast majority of the proposed research methodologies and effects were previously analyzed under these relevant past assessments (each of which addressed a batch of permit requests). Specific to the SWFSC permit requests, each assessment found that there would be no significant impacts associated with permit issuance. Accompanying biological opinions concluded that the actions would result in no jeopardy to the species (NMFS 2004b, 2005b, 2006b).

The relevant past assessments analyze the environmental consequences of the following activities: close approach during aerial surveys and photogrammetry, close approach during vessel surveys for photo-identification and behavioral observation, biopsy sampling, incidental harassment, and all tagging activities *except* satellite tagging of non-listed killer whales in the Antarctic currently proposed. Activities currently authorized, as mitigated by conditions of the

permit, are expected to result in similar effects to individual target animals as previously documented. The environmental consequences specific to SWFSC permit requests in the relevant past assessment are incorporated here by reference. These are standard research activities that when properly conducted could result in some short-term harassment of animals, but are not expected to permanently disrupt vital functions, reduce reproductive success, or cause serious injury or mortality. Animals have been documented as resuming previous activities within minutes of the research activity. Further, researchers and permit holders have noted that some individuals exhibit no observable reaction of disturbance or harassment during research. As described below, based on the relevant past assessments and reports from researchers, while more individual animals may be harassed, NMFS does not expect that populations or species are likely to be significantly impacted by the additional takes by close approach (aerial or vessel), biopsy sampling, tagging, or incidental harassment.

Effects of Invasive Satellite Tagging—Antarctic killer whales

NMFS recognizes that the proposed tags pose a slightly greater potential for disturbance and are more invasive than suction cup tags. Disturbance to the animal would mainly occur during the approach of the researchers and attachment of the tags. The most common responses by large whale species include head lifts, fluke lifts, exaggerated fluke beats on diving, quick dives, or increased swimming speeds (Mate et al. 2007). Other, less frequent responses that have been observed by researchers include fluke slaps, head lunges, fluke swishes, defecation, decreased surfacing rates, disaffiliation with a group of whales, and evasive swimming behavior (Mate et al. 2007). However, the authors note that all whale responses appear to be short-term with most animals resuming their prior activity after tagging. In a study involving projectile tag attachment to right whales, the behavior of the tagged whales did not change measurably, nor did that of other whales in the vicinity (Mate et al. 1997). Further, subsequent observations of tagged females with calves (calves not tagged) showed no apparent effect on the close association between mother and calf (Mate et al. 1997). In general, a whale's reaction appeared to be more in response to rapid vessel approaches, sudden underwater noises, and missed tags striking the water, than to the implanting of the tags themselves. Goodyear's (1993) work showed that large whales' responses to tagging can range from a skin twitch (one to two seconds after impact) to breaching; however, many times the animals display no response after the initial vessel approach. Animals tagged by pole instead of by projectile require a closer approach and had stronger reactions to tagging attempts (Mate et al. 1997). The Permit Holder noted that past experience of other researchers has shown that killer whales react more strongly to fully implantable tags and little or not at all to the proposed dorsal fin tags.

There is also the possibility of disturbing an animal from missed tag attempts. The tag hitting the water can cause a minimal, short-term startle response from the individual (Hooker et al. 2001; Watkins and Tyack 1991). Researchers have noted that sea state is an important factor in eliciting responses from whales during missed attempts. Animals appear to be more likely to respond to missed tagging attempts hitting the water in calm sea conditions (Hooker et al. 2001).

Any disturbance to the animals during tag attachment is usually short-lived and minimal. Animals normally return to pre-tagging behavior within a few minutes (Mate et al. 2007; Mate et al. 1997). Given this information, NMFS does not believe disturbance from the proposed

tagging is likely to reduce the reproduction, numbers, or distribution of Antarctic killer whales or have a significant cumulative effect on any research animals.

Further, potential adverse effects of tagging are minimized by using the smallest possible instrument package and smaller dart tips that minimize penetration into the whale's fin, minimizing the velocity of the package at impact, and disinfecting dart tips prior to tagging. These precautions would be for the safety of the researchers as well as to minimize any adverse impacts to the individual whales from the proposed activities.

As with any procedure that penetrates the skin, there exists the potential for infection at the site of the wound resulting from invasive tag attachment and from the persistent irritation that could result from the dart tips. Past research and permit annual reports using more invasive implantable tags have shown that the chance of infection from the break in the epidermis would be expected to be extremely low and insignificant. It appears that the effect of projectile tagging on whales is mild and short-lived and may be momentarily painful or startling, and that the pain and tissue damage resulting from the attachment of a tag is less than that caused by the actions of copepods and cookie cutter sharks that frequently parasitize whales. Mate et al. (1997) photographed several of the tagged North Atlantic right whales from their study years after the initial tagging and found that scarring was usually minimal and included only small, white, depressed scars at the site of tine attachment and pink cyamids in one case. "Overall, there was no visible evidence of adverse health effects (heavy external parasite loads, skin sloughing, etc.) from tagging" (Mate et al. 1997).

The proposed tags are designed to be shot by crossbow or air gun, penetrate the dorsal fin, and hold the tag for longer than the several day maximum common to suction cup techniques. The tag can transmit for up to 65 days, with an average longevity of 29 days before it eventually works its way out of the fin. These tags have been used successfully in a pilot study with Russ Andrews of the Alaska SeaLife Center (under a separate permit) in which two of the three killer whale ecotypes were tagged for up to 65 and 35 days (Andrews et al. 2005). Andrews et al. (2005) observed no adverse affects from the tagging study in terms of disturbance during deployment or injury from attachment. In their application, the SWFSC noted that since 2004, 13 of these killer whales tagged in the dorsal fin were re-sighted between 7 and 695 days after tagging and none of them had anything worse than a small (< 2 cm) wound that appeared to have healed well.

Loss of implantable tags in other cetacean species has been documented through re-sightings in several studies. A tag implanted into a finback whale was no longer attached to the whale when it was re-sighted four days after the last received transmission (Watkins et al. 1981). The researchers did not notice any evidence of injury or infection at the site of the tag loss (Watkins et al. 1981). Mate et al. (1997) successfully re-sighted a whale 58 days after tagging (16 days after the last received transmission). The cow was still with her calf, and there was no evidence of injury or infection at the tag site. Researchers only noted a single one centimeter diameter white scar where the tag had been implanted. Therefore, NMFS does not expect that the proposed tagging would likely injure individual animals, particularly injuries that might affect the feeding, reproductive, or migratory behavior of the individual animal.

Although the tags would create hydrodynamic drag, the proportion of the tags to the whale's size and weight is such that the energetic demand on the whale would likely be insignificant. Once the tag begins to work out of the animal's body, the risk of entanglement could potentially increase. However, at this point it would take very little drag to pull the tag out completely, thus potentially negating entanglement concerns. Once a tag is shed from the animal's body, it remains in the ocean environment and sinks to the seafloor. The tags do not contain any toxic agents or pathogens or any radioactive materials or chemicals that would adversely affect the marine environment.

Although, there is a possibility of minimal, short-term disturbance to the animals, there are several benefits to invasive tagging experiments. Similar to implantable tags, invasive tags have the capability to remain attached and transmit signals for longer time periods than suction cup tags. Attachment to the dorsal fin further increases the odds of a successful transmission to the satellite since the tags remain above the water surface longer than implantable tags. These tags would provide researchers and conservation managers with new and useful information that is important to the management and conservation of Antarctic killer whales and may result in the description of a new species. Overall, NMFS expects that the proposed satellite tagging is not likely to have a significant cumulative effect on any research animals or reduce the reproduction, numbers, or distribution of Antarctic killer whales.

Effects of Increases in Take to Target Species

In addition to considering the behavioral and physiological effects to individual animals as a result of the research activities, NMFS considered the impacts that increasing the level of take for these activities would have on each cetacean species currently authorized by the permit. New species, such as Antarctic minke whales, and rows for unidentified dolphin species were not considered because these would be new to the permit. Increases in take are requested for 26 non-ESA-listed species. It is important to note that not every research activity actually results in harassment of the animal. However, because the research has the *potential to* result in harassment, NMFS must issue takes for these activities.

NMFS expects any harassment due to research activities to be minimal and short-term. Hence NMFS does not expect that the increased take would result in the loss of animals from these populations or reduced reproductive success. No takes would be expected to result in serious injury or mortality. Further, the SWFSC has not reported any cases of mortality or serious injury of a marine mammal as a result of research activities. The researchers would still be bound to conduct their research activities in accordance with the mitigating conditions in their permit (see Section VII below for details) which would reduce and limit harassment of marine mammal species and the likelihood of a serious injury or mortality occurring. For these reasons, NMFS does not expect the target non-listed cetacean species/stocks to be significantly impacted by increased takes.

Effects to Non-target Species: Incidental harassment

Since the proposed action is specific to the target species and would be occurring during currently authorized research cruises, research activities would not be expected to have any

significant effects on other marine species, including protected large whales. Further, the SWFSC's permit currently authorizes the harassment of sea turtles and most marine mammals in the action area. No other listed species in the action area would be harassed by the proposed activities. More specifically, to prevent any potential harassment the SWFSC would remain at least 500 yards from any listed, non-target large whales (blue, fin, and sei whales) for which the permit does not authorize takes in the Southern Ocean. Relevant past assessments and accompanying biological opinions for the currently authorized research found that no non-target species would be significantly impacted by these research cruises. Given that the additional proposed research activities would occur during these cruises and that researchers would not attempt to approach or interact with other non-target species, NMFS does not expect that such animals would be impacted by the proposed action.

Effects to Physical Habitat

Given that the proposed action would target animals within the upper portion of the water column during currently authorized cruises and the fact that equipment would not contact any substrate, the proposed action would not affect any sediment, hard bottom, structures underlying the waters, or associated biological communities. Research gear would not be expected to affect the marine environment's physical or chemical properties. Therefore, the proposed action is not expected to impact any physical habitat, essential fish habitat or designated critical habitat. In addition, researchers would be required to obtain any other Federal, State or local permits necessary to conduct their research.

Summary of Effects

The proposed research activities would occur aboard currently authorized research cruises, limiting the effects of research mainly to the directed target species and other non-target marine mammal species for which the SWFSC is already authorized takes. The greatest potential adverse impact to target species from the research activities is disturbance. There is little information available on the long-term impacts of disturbance from these types of activities on the target marine mammals, and annual reports submitted by the Permit Holder indicate that no long-term effects have been observed from these research activities. Scientific literature indicates that disturbance such as that caused by close approach of vessels can disrupt vital functions such as feeding, mating, nursing and resting, at least temporarily. It is reasonable to assume that if such disruptions of vital functions are chronic and persistent, they may result in population level effects. However, the SWFSC's activities would not be conducted in a chronic or persistent manner and the nature/intent of their activities would preclude such effects from occurring. Further, mitigation measures of the permit would also prevent this from happening by limiting the harassment of any individual to 3 times per day as well as restricting activities that may disturb females with calves (see Sect. VII below).

The proposed research activities are specific to the target species, and the majority of these activities are already authorized by Permit No. 774-1714-06. Any effects of close approach, biopsy sampling, tagging, and incidental harassment to these individuals, populations, or species would be short-term, low impact, and involve minimal disturbance or harassment. Further, the proposed research activities are not expected to adversely affect the survival, longevity, or

lifetime reproductive success of adult female cetaceans or the fitness of calves under the care of an adult female. No mortalities would be authorized for the proposed activities. NMFS believes that unintentional mortality or serious injury would not be likely to occur as a result of the proposed activities. In addition, mitigation measures in the current permit would remain in effect and be expected to lessen any potential for accidental mortality or serious injury as well as reduce, to the maximum extent possible, the potential for adverse effects of the research on the target marine mammal species. Given this information, NMFS does not expect that the requested additional takes would significantly impact the target populations or species.

The SWFSC's permit currently authorizes takes for the incidental harassment of other species that could be in the vicinity of research. In addition, the SWFSC does not intend to approach any non-target species not authorized by the permit. Therefore, NMFS does not expect that the proposed individual activities would have significant effects on any non-target species not authorized by the permit.

The proposed scientific research is not likely to destroy or adversely modify critical habitat. In accordance with Section 7 of the ESA, a consultation was completed for those aspects of the proposed action that may affect listed species and their habitat (see Section IX). Likewise, an EFH consultation was completed for the underlying permit which determined that the proposed scientific research is not likely to adversely affect any EFH (see Section X). None of the proposed techniques has a measurable potential to alter any substrate or bottom habitat. In addition, the research activities proposed in the permit request would be unlikely to affect the physical or socioeconomic environment.

The proposed research would provide important information that would help conserve, manage, and recover marine mammals as required by the ESA, MMPA, and implementing regulations. NMFS has concluded that issuance of Permit No. 774-1714-07, as proposed, would not likely jeopardize the continued existence of any endangered species and would not likely destroy or adversely modify designated critical habitat. NMFS believes issuance of the permit amendment would be consistent with the goals of the ESA and MMPA.

B. No Action: An alternative to the proposed action is no action, i.e., denial of the permit amendment request. Under this scenario, research would continue to occur as authorized under Permit No. 774-1714-06 but the increased level of takes would not be issued. This alternative would eliminate any potential risk to the environment from the proposed research activities. However, it would not allow the research to be conducted and the opportunity would be lost to collect information that would contribute to better understanding marine mammal populations and provide information to NMFS that is needed to implement NMFS management activities and develop stock assessments.

More specifically, the No Action alternative would prohibit the researchers from collecting valuable information on cetacean species in the Southern and North Pacific Oceans. The current authorized research activities would still occur but the additional new information that could be gathered would be lost. The work described in the proposed action directly addresses research needs identified in NMFS recovery plans, and should contribute substantially to conservation

efforts by providing critical information about cetacean biology and ecology on these protected species. For example, this amendment would allow researchers to establish initial assessments of pantropical spotted dolphin and spinner dolphin populations in the Eastern Tropical Pacific and examine the effects of their interaction with the tuna fishery. It would allow the SWFSC to analyze the levels of reproductive steroid hormones in blubber samples of short-beaked common dolphins to determine life history traits such as pregnancy rates and age at sexual maturity. Studying Antarctic minke whales and humpback whales in the Southern Ocean will help researchers determine if these species are prey items for Antarctic killer whales. Studying sperm whales and killer whales in the Southern Ocean will provide information on stock structure and habitat use and could lead to identifying a new species of killer whales. Without good information on cetacean biology, ecology, and behavior, management decisions may be too conservative or not sufficiently conservative to ensure a stock or species to recover.

VII. Mitigation and Minimization Measures: In addition to the mitigation measures identified by researchers in their applications and otherwise considered "good practice or protocol," all NMFS marine mammal research permits contain conditions intended to minimize the potential adverse effects of the research activities on the animals. These conditions are based on the type of research authorized, the species involved, and information in the literature and from the researchers themselves about the effects of particular research techniques and the responses of animals to these activities. Specifically, the following conditions for cetaceans are in the SWFSC's current permit (No. 774-1714-06) and would remain in effect. All other conditions that are not specific to this amendment would also remain in effect including those for other authorized species (pinnipeds and sea turtles) as well as the import and export of parts.

1. Large cetaceans: All age and sex classes of animals in Table 1 may be approached for surveys and photo-id. All animals to be biopsy sampled and tagged are a subset of animals authorized for harassment during vessel surveys. The following restrictions apply to sampling and tagging:

    a. Only adults, juveniles and calves 6 months of age or older may be biopsy sampled, including females with calves;

    b. No calves of any age will be tagged;

    c. North Pacific right whales: Females attending calves greater than 6 months of age may be biopsy sampled and/or tagged. Calves of any age or females attending calves younger than 6 months of age will not be tagged or biopsy sampled; and

    d. Southern Resident killer whales: Biopsies may be collected from both sexes and all ages, *except* calves under 1 year of age and their accompanying mothers.

2. Other cetaceans: All age and sex classes of animals in Table 2 may be approached for surveys and photo-id. Only adults, juveniles, calves greater than 1 year old and females with calves greater than 1 year old may be biopsy sampled (except killer whales). No

calves will be tagged. All animals to be biopsy sampled and tagged are a subset of animals authorized for harassment during vessel surveys.

3. The endangered species listed in Table 1 may be approached as many times as necessary to obtain samples and deploy tags but may not be harassed more than three times per day.

4. The following tag types may be used: Radio Transmitter; Time-Depth-Recorder; Satellite tags, and crittercam. The tags may be deployed by either a crossbow, gun, pole. Smaller tags of the same type may be used for animals in Table 1.

5. If one animal is killed or seriously injured as a result of the authorized activities, research must be suspended and the protocol reviewed and, if necessary, revised to the satisfaction of NMFS in consultation with the Marine Mammal Commission. The Permit Holder must submit in writing within 2 weeks, a report that includes a complete description of the events surrounding the incident and identification of steps that will be taken to reduce the potential for additional accidents. The Permit Holder must send this report to the Chief, Permits, Conservation and Education Division, F/PR1, 1315 East-West Highway, Silver Spring, MD 20910. Research may recommence upon review of that information and authorization by the Chief, Permits, Conservation and Education Division.

6. Exceeding Authorized Take: If the authorized level of take is exceeded research must cease immediately and the Holder must notify the Chief, Permits, Conservation and Education Division by phone (301/713-2289) as soon as possible, but no later than two days after the authorized level of take is exceeded. The Permit Holder must then submit a written report to the above contact describing the circumstances of the unauthorized take and requesting a modification to continue research activities.

7. Under no circumstances may any marine mammal parts obtained or imported under the authority of this permit, <u>including cell lines</u>, be bought, sold, or used for commercial purposes. Recipients of cell lines developed from the marine mammal parts taken under the authority of this permit must either be designated as CIs on this permit or hold a permit that authorizes research on marine mammal cell lines.

8. If a sea otter is injured or killed during research activities, research must also be suspended. For any injury or death of a sea otter, in addition to the requirements in Condition B.1.b above, a report must also be sent to the U.S. Fish and Wildlife Service (USFWS) Division of Management Authority, 4401 N. Fairfax Dr., Room 700, Arlington, VA, 22203 (1-800-358-2104) and the USFWS Western Washington Fish and Wildlife Office, 510 Desmond Dr. Suite 102, Lacey, WA 98503 (360-753-9440).

9. For activities occurring in near-shore kelp beds between mid-July and December 31, if marbled murrelets are present, reduce boat speed to 10 miles-per-hour, maintain a consistent heading, and make only one pass through per day.

10. This permit does not authorize takes of any protected species not identified in Take Tables of this permit, including those species under the jurisdiction of the USFWS.

Should other protected species be encountered during the research activities authorized under this permit, researchers should exercise caution and remain a safe distance from the animal(s) to avoid take, including harassment.

11. This permit does not authorize research activities off the Northwest Olympic Peninsula, particularly Cape Flattery and Neah Bay areas. This includes the waters located south of the U.S./Canada border, west of 124º W and north of 48º N. To conduct research in this area, the Permit Holder is required to obtain authorization from the native Makah Nations.

12. Caution must be exercised when approaching all marine mammals, particularly mother/pup pairs, and efforts to approach and handle a particular animal or mother/pup pair must be immediately terminated if there is any evidence that the activity(ies) may be life-threatening or interfering with reproduction, feeding, or other vital biological functions.

13. Where females with calves >6 months old are authorized to be taken, Researchers:

    1) Must immediately terminate efforts if there is any evidence that the activity may be interfering with pair-bonding or nursing;

    2) Must not position the research vessel between the mother and calf; and

    3) Must sample the calf first to minimize the mother's reaction when sampling mother/calf pairs.

14. Biopsy Sampling and Tagging

    1) An animal is considered to have been taken if:

        (A) during an attempt the dart or tag package hits the water and the animal reacts; or

        (B) during an attempt the dart or tag hit the animal but does not land or yield a sample.

    2) All biopsy and barbed tag dart tips must be disinfected between uses.

    3) Before attempting to sample an individual, when practicable, Researchers must take reasonable measures (e.g., compare photo-identifications) to avoid repeated sampling of any individual.

15. Aerial/Vessel Surveys

    1) Aerial surveys will be flown at 500 ft or above.

2) Bowhead whale research activities authorized herein must not be conducted in a manner or at a time that will interfere with the Eskimo subsistence harvest or the bowhead census team.

3) To minimize disturbance: If an animal shows a response to the presence of the aircraft, the aircraft must leave the vicinity and either resume searching or continue on the line-transect survey for other cetaceans.

4) To minimize stress, pain, or suffering, researchers must exercise caution when approaching animals, particularly mother/calf pairs, and must retreat from animals if behaviors indicate the approach may be interfering with reproduction, feeding, or other vital functions. The approaches must be gradual to minimize or avoid any sort of startle response. If there is evidence of avoidance, a maximum of three approaches may be attempted then the encounter must be terminated.

16. Biological samples:

1) All specimen materials collected or obtained under this authority shall be maintained according to accepted curatorial standards. After completion of initial research goals, any remaining samples shall be deposited into a *bona fide* scientific collection which meets the minimum standards of curatorial collection and data cataloging as established by the scientific community.

17. <u>For research in the inland waters of Washington state:</u>

At all times when vessels engaging in research activities are in the inland waters of Washington, such vessels shall fly a clearly visible triangular pennant. The pennant shall be yellow in color with minimum dimensions of 18"H x 26"L and with the permit number displayed in 6" high black numerals.

In addition to these mitigation measures, in signing the permit, the researchers acknowledge that the permit does not relieve them of the responsibility to obtain any other permits, or comply with any other Federal, State, local, or international laws or regulations.

VIII. Cumulative Impacts

The attached biological opinion includes an analysis of the effects of past and ongoing human and natural factors (fisheries, seismic activities, existing NMFS research permits, and other activities) leading to the current status of the target ESA-listed species, their habitat, and ecosystem within the action area. It discusses the past and present impacts of all state, tribal, local, private, and other human activities in the action area, including other permitted research impacts of these activities that will occur contemporaneously with this analysis. General threats facing cetaceans range-wide are also discussed in the opinion. These activities and threats are expected to continue into the future. The biological opinion provides an integration and synthesis of the information about the status of these species, past and present activities affecting the species, possible future actions that might affect the species, and effects of the proposed

action in order to provide a basis for determining the additive effects of the takes authorized in the amended permit on the target ESA-listed whales, in light of their present and anticipated future status. The biological opinion concluded that the proposed action would not likely jeopardize the continued existence of these species and would not likely destroy or adversely modify designated critical habitat. Affects on other listed species were addressed in the prior biological opinions for this permit and this proposed action does not involve or change the nature of effects to those species.

The baseline for the biological opinion provides a useful environmental baseline for consideration of cumulative effects to ESA-listed species. The baseline for that document includes the past and present impacts of state, Federal or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone consultations under Section 7 of the ESA, and the impact of contemporaneous state or private actions. The details of the wide variety of human activities and natural phenomena that may affect the resources within the action area are documented in the various recovery plans for target species listed under the ESA (see http://www.nmfs.noaa.gov/pr, NMFS Stock Assessment Reports, and numerous biological opinions under the ESA prepared on Federally-permitted fisheries and vessel operations, including dredging and disposal operations).

The proposed action includes takes by close approach (during aerial and vessel surveys), biopsy sampling, tagging, and incidental harassment of numerous cetacean species. Any impacts from these takes would be short-term and minimal to the individuals and negligible to stocks or populations and the species. These activities are not intrusive, or minimally so, and do not involve any long-term adverse impacts to individuals, populations, or the species. The proposed activities would not result in the serious injury or death of any animal. Nor does NMFS expect that the proposed research would likely reduce the reproduction, numbers, or distribution of these species. Consequently, the increased take levels of the requested activities, cumulatively under the permit are not expected to result in significant adverse effects to the targeted populations or species. In addition, conditions, or mitigation measures, of the permit would effectively minimize any adverse impacts of the proposed cetacean takes. Therefore, NMFS does not believe that the proposed action would likely have a significant cumulative effect on the target species or any non-target species. Moreover, NMFS feels that the valuable information that would be collected from this research would aid the conservation and management of these species and ultimately aid their recovery.

In addition to the synergistic or additive effects of the combination of research activities proposed, it is necessary to address whether the proposed action is “related to other actions with individually insignificant but cumulatively significant impacts.” Cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Significance from the proposed action cannot be avoided if it is reasonable to anticipate a significant cumulative impact on the environment.

As discussed earlier, NMFS has determined that the proposed action would not have a significant cumulative effect on either the human or marine environment. The proposed action is only

directed at specific marine mammals and would not have a significant cumulative effect on non-target species in the proposed action area. Therefore, the following analysis of cumulative effects focuses solely on the target species where directed takes are requested in the proposed action. The following analysis provides a brief summary of the past, present, and future human-related activities affecting these specific target species in the proposed action area.

Natural Mortality. Natural mortality in cetaceans, especially large whale species, is largely unknown. Although factors contributing to natural mortality cannot be quantified at this time, there are a number of suspected causes, including parasites, predation, red tide toxins and ice entrapment. For example, the giant spirurid nematode (*Crassicauda boopis*) has been attributed to congestive kidney failure and death in some large whale species (Lambertsen 1986). A well-documented observation of killer whales attacking a blue whale off Baja, California proves that blue whales are at least occasionally vulnerable to these predators (Tarpy 1979). Evidence of ice entrapment and predation by killer whales has been documented in almost every bowhead whale stock although the percentage of whales entrapped in ice is considered to be small (Tomilin 1957; Nerini et al. 1984; Philo et al. 1993). Other stochastic events, such as fluctuations in weather and ocean temperature affecting prey availability, may also contribute to large whale natural mortality.

Commercial Whaling and Subsistence Hunting. Large whale population numbers in the proposed action area have been impacted historically by commercial exploitation, mainly in the form of whaling. The development of steam-powered boats in the late 19th century, coupled with the use of the forward-mounted gun-fired harpoon, made it possible to more efficiently kill and tow ashore the larger baleen whale species such as blue, humpback, and minke whales. Prior to current prohibitions on whaling, most large whale species had been depleted to the extent that it was necessary to list them as endangered under the ESA. For example, from 1900 to 1965 nearly 30,000 humpback whales were taken in the Pacific Ocean with an unknown number of additional animals taken prior to 1900 (Perry et al. 1999).

In the southern hemisphere, commercial whalers took at least 68,000 humpback whales prior to the IWC's 1966 ban on humpback whaling (Bonner 1982). As humpback catches dropped, blue whale catches began to climb, taking thousands of whales annually from 1914-1924 and by the late 1920s, tens of thousands of whales annually (Mizroch et al. 1984). As catches of blue whales declined, whalers took on average over 20,000 whales per year from the mid-1940s through the 1960s (Mizroch et al. 1984). Commercial whalers did not take large numbers of Antarctic minke whales until the early 1970s, when stocks of blue, fin, sei, and humpback whales had been depleted.

Although commercial whaling no longer occurs for the target large whale species in the proposed action area, the historical impacts of whaling need to be considered as having a significant impact to large whale population numbers.

Today, subsistence hunting occurs for some cetacean species. For example, the Russian aboriginals and the Makah Indian Tribes have traditionally hunted gray whales. Hunting of bowhead whales by Eskimos has occurred for at least 2,000 years (Stoker and Krupnik 1993). The IWC has allowed subsistence groups to take limited numbers of large whale species under a

managed quota scheme. In the North Pacific, from 2008-2012 a total of 280 bowhead whales may be taken from the Bering-Chuckchi-Beaufort Seas stock, with no more than 67 taken annually. Likewise, a total of 620 Eastern North Pacific gray whales may be taken by subsistence groups in this time period, with no more than 140 taken annually. No take data is available yet for this time frame however, data from 2003-2007 (under identical quotas) indicates that a total of 207 bowhead whales and gray whales were taken by subsistence groups. However, legal subsistence hunting is not considered to have a significant impact on current large whale populations in the proposed action area.

Entrapment and Entanglement in Commercial Fishing Gear. Entrapment and entanglement in commercial fishing gear is one of the most frequently documented sources of human-caused mortality in large whale species. For example, an estimated 78 rorquals were killed annually in the offshore southern California drift gillnet fishery during the 1980s (Heyning and Lewis 1990). From 2001-2005, 40 humpback whales of the Central North Pacific population were found entangled in fishing gear (Angliss and Outlaw 2007). In 1996, a vessel from Pacific Missile Range Facility in Hawaii rescued an entangled humpback, removing two crabpot floats from the whale. Sperm whale interaction with the longline fisheries in the Gulf of Alaska was first documented as an entanglement that occurred in June of 1997 (Hill and Mitchell 1998). Blue whales potentially interact with the offshore gillnet fishery, but no mortalities or serious injury were observed from 1998 to 2002 (Carretta et al. 2007).

The Antarctic krill fishery may operate within the proposed Antarctic study area. However, no cetacean species were reported to interact with any of the Southern Ocean fisheries regulated by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) during the 2005-2006 season.

Aside from the potential of entrapment and entanglement, there is also concern that many marine mammals that die from entanglement in commercial fishing gear tend to sink rather than strand ashore thus making it difficult to accurately determine the frequency of such mortalities. Entanglement may also make cetaceans more vulnerable to additional dangers, such as predation and ship strikes, by restricting agility and swimming speed.

Ship Strikes. Collisions with commercial ships are an increasing threat to many cetacean species, particularly as shipping lanes cross important large whale breeding and feeding habitats or migratory routes. The number of observed physical injuries to humpback whales as a result of ship collisions has increased in Hawaiian waters. On the Pacific coast, at least 0.2 humpback whales were killed annually by ship strikes from 1999-2003; likewise, from 1998-2002 0.2 blue whales were killed by ship strike annually as well (Carretta et al. 2007). From 1996-2002, Glacier Bay National Park reported that eight humpback whales were struck by vessels in Alaskan waters. In 1996, a humpback whale calf was found stranded on Oahu with evidence of vessel collision (propeller cuts; NMFS unpub. data).

Overall, incidences of ship strikes on cetaceans in the proposed action area are difficult to quantify and little to no information is available on the number of animals that have been killed or seriously injured by interactions by ship strikes outside of U.S. jurisdiction, including the Southern Ocean.

Habitat Degradation. Degradation of habitat can occur both naturally and as a result of human activities. Chronic exposure to the neurotoxins associated with paralytic shellfish poisoning (PSP) via contaminated zooplankton prey has been shown to have detrimental effects on marine mammals. Estimated ingestion rates are sufficiently high enough to suggest that the PSP toxins are affecting marine mammals, possibly resulting in lower respiratory function, changes in feeding behavior, and a lower reproductive fitness (Durbin et al. 2002).

Anthropogenic activities, such as emitting discharge from wastewater facilities, dredging, ocean dumping and disposal, aquaculture, and coastal development are also known to have deleterious impacts on marine mammals and their prey's habitat, ultimately affecting the animals themselves. In the North Pacific, extraction of mineral deposits, as well as dredging of major shipping channels pose a continued threat to the coastal habitat of large whales. Point source pollutants from coastal runoff, at sea disposal of dredged material and sewage effluents, oil spills, as well as substantial commercial and recreational vessel traffic and impacts of fishing operations continue to negatively affect marine mammals in the proposed action areas.

The impacts from these activities are difficult to measure. However, some researchers have correlated contaminant exposure to possible adverse health effects in marine mammals. Organochlorines are chemicals that tend to bioaccumulate through the food chain, thereby increasing the potential of exposure to a marine mammal via its food source. During pregnancy and nursing, some of these contaminants can be passed from the mother to developing offspring. Contaminants like organochlorines do not tend to accumulate in significant amounts in invertebrates, but do accumulate in fish and fish-eating animals. Thus, contaminant levels in planktivorous mysticetes have been reported to be one to two orders of magnitude lower compared to piscivorous odontocetes (Borell 1993; O'Shea and Brownell 1994; O'Hara and Rice 1996; O'Hara et al. 1999).

The impacts of sound in the water are also a growing concern. Animals inhabiting the marine environment are continually exposed to many sources of sound. Naturally occurring sounds such as lightning, rain, sub-sea earthquakes, and animal vocalizations (*e.g.,* whale songs) occur regularly. There is evidence that anthropogenic sound has substantially increased the ambient level of sound in the ocean over the last 50 years. Much of this increase is due to increased shipping as ships become more numerous and larger. Commercial fishing vessels, cruise ships, transport boats, airplanes, helicopters, and recreational boats all emit sound into the ocean. The military uses acoustics to test the construction of new vessels as well as for naval operations. In some areas where oil and gas production takes place, noise originates from the drilling and production platforms, tankers, vessel and aircraft support, seismic surveys, and the explosive removal of platforms. Many researchers have described behavioral responses of marine mammals to sounds produced by helicopters and fixed-wing aircraft, boats and ships, as well as dredging, construction, and geological explorations (Richardson 1995). Most observations have been limited to short-term behavioral responses, which included cessation of feeding, resting, or social interactions. Several studies have demonstrated short-term effects of disturbance on humpback whale behavior (Hall 1982; Baker et al. 1983; Krieger and Wing 1984; Bauer and Herman 1986), but the long-term effects, if any, are unclear or not detectable. A habitat concern

for cetaceans is the increasing level of anthropogenic sound that may affect their communication (Carretta et al. 2007).

Humpback whales seem to respond to moving sound sources, such as whale-watching vessels, fishing vessels, recreational vessels, and low-flying aircraft (Anon. 1987; Tinney 1988; Atkins and Swartz 1989; Beach and Weinrich 1989; Clapham et al. 1993). Their responses to noise are variable and have been correlated with the size, composition, and behavior of the whales when the noises occurred (Herman et al. 1980; Watkins et al. 1981; Glockner-Ferrari and Ferrari 1985; Krieger and Wing 1984; Glockner-Ferrari 1990). Several investigators have suggested that noise may have caused humpback whales to avoid or leave feeding or nursery areas (Jurasz and Jurasz 1979; Glockner-Ferrari and Ferrari 1985; Glockner-Ferrari 1990; Salden 1988), while others have suggested that humpback whales may become habituated to vessel traffic and its associated noise (Watkins 1986; Belt et al. 1989).

The marine mammals and their prey that occur in the proposed action area are regularly exposed to these types of natural and anthropogenic sounds in the North Pacific and possibly, to a lesser extent, in the Southern Ocean. Marine mammals can be found in areas of intense human activity, suggesting that some individuals or populations may tolerate, or have become habituated to, certain levels of exposure to noise (Richardson 1995). However, the cumulative effects of these activities cannot be predicted with certainty. Impacts may be chronic, resulting in behavioral changes that can stress the animal and ultimately lead to increased vulnerability to parasites and disease. The net effect of disturbance is dependent on the size and percentage of the population affected, the ecological importance of the disturbed area to the animals, the parameters that influence an animal's sensitivity to disturbance or the accommodation time in response to prolonged disturbance (Geraci and St. Aubin 1980).

Commercial and Private Marine Mammal Watching. In addition to the Federal, private and commercial shipping operations, commercial and private vessels engaged in marine mammal watching also have the potential to impact baleen whales in the proposed action area of the North Pacific and, to a lesser extent, in the Southern Ocean. A recent study of whale watch activities worldwide has found that the business of viewing whales and dolphins in their natural habitat has grown rapidly over the past decade into a billion dollar (U.S. dollars) industry involving over 80 countries and territories and over 9 million participants (Hoyt 2001). In 1988, a workshop sponsored by the Center for Marine Conservation (CMC) and NMFS was held in Monterey, California to review and evaluate whale watching programs and management needs. Several recommendations were made to address concerns about the harassment of marine mammals during wildlife viewing activities including the development of regulations to restrict operating thrill craft near cetaceans, swimming and diving with the animals, and feeding cetaceans in the wild.

Since that time, NMFS has promulgated regulations at 50 CFR 224.103 that specifically prohibit in waters off Hawaii and Alaska: (1) the negligent or intentional operation of an aircraft or vessel, or the doing of any other negligent or intentional act which results in disturbing or molesting a humpback or northern right whale; and (2) approaching humpback whales closer than 100 yards (91.4 m). In addition, NMFS has launched an education and outreach campaign to provide commercial operators and the general public with responsible marine mammal

viewing guidelines which state that viewers should: (1) remain at least 50 yards from dolphins, porpoise, seals, sea lions and sea turtles and 100 yards from large whales; (2) limit observation time to 30 minutes; (3) never encircle, chase or entrap animals with boats; (4) place boat engine in neutral if approached by a wild marine mammal; (5) leave the water if approached while swimming; and (6) never feed wild marine mammals. In January 2002, NMFS also published an official policy on human interactions with wild marine mammals which states that:

> "*NOAA Fisheries cannot support, condone, approve or authorize activities that involve closely approaching, interacting or attempting to interact with whales, dolphins, porpoises, seals or sea lions in the wild. This includes attempting to swim with, pet, touch or elicit a reaction from the animals.*"

Although marine mammal watching is considered by many to be a non-consumptive use of marine mammals with economic, recreational, educational and scientific benefits, it is not without potential negative impacts. One concern is that animals may become more vulnerable to vessel strikes once they habituate to vessel traffic (Swingle et al. 1993; Wiley et al. 1995). Another concern is that preferred habitats may be abandoned if disturbance levels are too high. In the Notice of Availability of Revised Whale Watch Guidelines for Vessel Operations in the Northeastern United States (64 FR 29270; June 1, 1999), NMFS noted that whale watch vessel operators seek out areas where whales concentrate, which has led to numbers of vessels congregating around groups of whales, increasing the potential for harassment, injury or even the death of these animals. Several recent research efforts have monitored and evaluated the impacts of people closely approaching, swimming, touching, and feeding marine mammals and have suggested that marine mammals are at risk of being disturbed ("harassed"), displaced or injured by such close interactions. Researchers are reporting boat strikes, disturbance of vital behaviors and social groups, separation of mothers and young, abandonment of resting areas, and habituation to humans (Kruse 1991; Wells and Scott 1997; Samuels and Bejder 1998; Bejder et al. 1999; Colborn 1999; Cope et al. 1999; Mann et al. 2000; Samuels et al. 2000; Boren et al. 2001; Constantine 2001; Nowacek et al. 2001). A long-term study of tourism in Shark Bay, Australia found that increased dolphin-watching activities over time largely led to a decline in dolphin abundance suggesting that animals shifted to areas with less vessel traffic (Bejder et al. 2006). Although it remains difficult to quantify the cumulative impacts of marine mammal viewing activities in the proposed action area given that the target species are already impacted by viewing activities and vessels already present in the marine environment, the proposed research would contribute a negligible increment over and above the effects of the baseline activities currently occurring in the marine environment of the proposed action area.

Incidental Take Authorizations (ITAs). There are four active ITAs (two incidental harassment authorizations and two letters of authorization) on the target cetacean species within the Pacific Ocean. An ITA has been requested by the U.S. Navy for actions in the vicinity of the Hawaii Range Complex, primarily for Level B harassment associated with acoustic effects on marine mammals. That request is currently under review within NMFS, and is available at http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications. There are no ITAs in the Southern Ocean.

Scientific Research. Marine mammals have been the subject of field studies for decades. The primary purposes of most studies are generally for monitoring populations and gathering data for behavioral and ecological studies. Over time, NMFS has issued dozens of permits for takes of marine mammals in the proposed action area by harassment from a variety of activities, including aerial and vessel surveys, photo-identification, remote biopsy sampling, and attachment of scientific instruments. The number of permits and associated takes by harassment indicate a high level of research effort relative to the population size of some endangered marine mammal species in the proposed action area. This is due, in part, to intense interest in developing appropriate management and conservation measures to recover these species. Given the number of permits, associated takes, as well as research vessels and personnel present in the environment, repeated disturbance of individual large whales is likely to occur in some instances, particularly in the North Pacific (due to a higher level of human activity than in the Southern Ocean). It is difficult to assess the effects of such disturbance. However, NMFS has taken steps to limit repeated harassment and avoid unnecessary duplication of effort through permit conditions requiring coordination among permit holders. NMFS would continue to monitor the effectiveness of these conditions in avoiding unnecessary repeated disturbances.

It is also important to note that some of the target large whale species of the proposed research are migratory and may transit in and out of U.S. waters and the high seas. NMFS does not have jurisdiction over the activities of individuals conducting field studies in other nations' waters and cumulative effects from all scientific research on these species across the proposed action area cannot be fully assessed. For instance, in the Southern Ocean, Japan lethally took 10 fin and 856 minke whales in 2005-2006 as part of their scientific whaling program. In the North Pacific, they took 5 sperm, 100 sei, 50 Brydes, and 101 minke whales in this time period.

However, where possible, NMFS attempts to collaborate with foreign governments to address management and conservation of these transboundary ESA-listed species. All of the issues noted above are likely to have some level of impact on marine mammal populations in the proposed action area, particularly where ESA-listed (endangered and threatened) and MMPA depleted species are involved. Although commercial harvests no longer take place and existing subsistence harvest is set by quotas, historic impacts from these activities still affect many of these populations. In addition, entanglement in fishing gear, ship collisions, habitat degradation, biotoxins, viewing pressures, scientific research, and noise pollution continue to result in some level of impact to cetacean populations in the proposed action area. However, the proposed research would contribute a negligible increment over and above the effects of the baseline activities currently occurring in the marine environment of the proposed action area. In addition, while the effects of repeated or chronic disturbance from scientific research activities should not be dismissed, the potential benefits of information gained from the proposed action in reducing the effects of human activities on these species outweighs what is likely an overall small increase in harassment.

Currently, 31 NMFS permits authorize research on the target cetacean species in the proposed action area. Twenty-five of these permits (Appendix 2) authorize research on the target ESA-listed species (humpback and sperm whales) in the North Pacific and/or Southern Ocean, including the SWFSC's current permit (No. 774-1714-06). (Please see Appendix 1 for the current cetacean takes authorized by Permit No. 774-1714-06 for the entire *5-year period*.) The

authorized takes for these ESA species are summarized in Appendix 3 as well as the requested takes of the proposed action. In addition to these permits, one permit (NMFS Marine Mammal Health and Stranding Response Program, File No. 932-1489) authorizes takes of stranded or distressed marine mammals, including disentangling whales.

Although Appendix 3 shows that thousands of takes have been authorized for scientific research for these two endangered species, an analysis of the takes reported by these permits indicates that the large majority of authorized takes have not been used, thereby reducing the impacts of research to these species. No Permit Holders have exceeded their take limits. For instance, although 150 biopsy takes have been authorized for sperm whales, no biopsy takes have actually been reported in the Southern Ocean by Permit Holders. Further, none of these permitted researchers have reported a mortality due to the authorized research activities.

Based on the analysis of reported takes by researchers, NMFS does not feel that the number of proposed takes, when added, cumulatively, to the currently authorized research activities occurring in the North Pacific and Southern Oceans, would adversely impact the targeted listed whales or any other endangered species. In addition, all permits for research on marine mammals issued by NMFS, including the proposed permit amendment, contain conditions requiring the permit holders to coordinate their activities with the NMFS regional offices and other permit holders conducting research on the same species in the same areas. To the extent possible, researchers should share data to avoid unnecessary duplication of research and disturbance of animals.

Overall, the proposed action would not be expected to have more than short-term or negligible effects on the target species, including endangered humpback and sperm whales. Based on the analysis conducted under this SEA, as well as the relevant past assessments, NMFS believes that the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions discussed here and in the biological opinion would be minimal and not significant. The research would provide information that would help manage and recover the target marine mammal species and would outweigh any adverse impacts that may occur.

IX. Compliance with the Endangered Species Act: To comply with Section 7 of the regulations (50 CFR '402.14(c)), a Section 7 Consultation was initiated by the NMFS Permits, Conservation, and Education Division under the ESA. In accordance with Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 et seq.), a Biological Opinion (attached) was prepared for the proposed action and it concluded that the issuance of Permit No. 774-1714-07 and the conduct of the research it authorizes under the permit is not likely to jeopardize the continued existence of the endangered humpback whale and sperm whale nor any other endangered species. No serious injury or mortality would be expected. It also concluded that the proposed action would not likely destroy or adversely modify critical habitat.

X. Compliance with the Magnuson-Stevens Act: Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) requires NMFS to complete an EFH consultation for any action authorized, funded, or undertaken, or proposed to be authorized,

funded, or undertaken by the agency that may adversely affect EFH. Because the proposed research would be conducted as part of currently authorized research surveys, NMFS does not expect that the additional takes would change the original determination for Permit No. 774-1714 that the research activities would not adversely affect EFH. The overall action area for the permit would not change and the one new method of satellite tagging proposed would not impact the physical, chemical or biological properties of any EFH. Therefore, no consultation was necessary.

XI. Coordination with the National Ocean Service: The research activities as proposed by the SWFSC would occur as part on currently authorized research surveys. The current permit contains a condition that would remain in effect stating the Permit Holder must obtain the necessary permits or authorization from any National Marine Sanctuaries where they would be conducting research activities.

XII. Public Comment

The permit application was published in the Federal Register on March 12, 2007 to provide the public 30 days to comment. One person commented on the proposed permit, questioning the validity of the research generally. The commenter also opined that NMFS issues too many permits for this research and that and doesn't feel it adds any value to the species.

The commenter did not contact the Permits Division for additional information or request a copy of the amendment request. The proposed research activities would be conducted by trained personnel with mitigation measures that would minimize the effects of research activities. No lethal takes would be authorized or are expected as a result of the research activities. Further, NMFS believes the research would provide valuable information on cetacean species in the Southern and North Pacific Oceans. The work described in the proposed action directly addresses research needs identified in NMFS recovery plans, and should contribute substantially to conservation efforts by providing critical information about cetacean biology and ecology on these protected species. Without good information on cetacean biology, ecology, and behavior, management decisions may be too conservative or not sufficiently conservative to ensure a stock or species to recover. In addition, the proposed research has been reviewed by the Marine Mammal Commission, NMFS Science Center and Regional Office staff, and NMFS Office of Protected Resources, who have concurred that the research would be *bona fide*.

XIII. Preparers: This document was prepared by Amy Hapeman with the Permits, Conservation and Education Division of NMFS' Office of Protected Resources in Silver Spring, Maryland.

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Appendix 1: Permit No. 774-1714-06 Currently Authorized Takes for Cetacean Species.

Table 2. Cetacean Studies (Endangered Species): The following number of animals, by species, may be taken over a five-year period. Efforts to biopsy sample or tag an individual shall not exceed three attempts.

Species (common name) (Scientific name)	Locations/ Stocks	Directed Takes over 5 years (includes collection of sloughed skin)					Harassment incidental to all research activities
		Aerial Photo-grammetry	Vessel surveys 500ft		Tagging		
			Biopsy	Photo ID	radio/ TDR	satellite	
Bowhead whale *Balaena mysticetus*	North Pacific, Arctic Ocean	--	100	250	--	--	1,000
Sei whale *Balaenoptera borealis*	Pacific Ocean (U.S. EEZs and ETP)	1,000	500	1,000	125	125	5,000
Blue whale *Balaenoptera musculus*	Pacific Ocean (U.S. EEZs and ETP)	1,000	500	1,000	125	125	5,000
Fin whale *Balaenoptera physalus*	Pacific Ocean (U.S. EEZs and ETP)	1,000	500	1,000	125	125	5,000
Southern right whale *Eubalaena australis*	Southern Hemisphere	--	50	100	--	--	1,000
Northern right whale *Eubalaena japonica*	North Pacific	100	50	100	20	20	100
Sperm whale *Physeter macrocephalus*	Pacific Ocean (U.S. EEZs and ETP)	5,000	500	1000	125	125	5,000
Humpback whale *Megaptera novaeangliae*	Pacific Ocean (U.S. EEZs and ETP)	1,000	1,500	3,000	115 25 may be tagged with a crittercam	110	5,000
Vaquita *Phocoena sinus*	Gulf of California	250	50	100	--	--	1000

Table 3. Small Cetacean Assessments - The following number of animals, by species, may be taken over a five-year period**.**

Species **Common name** ***Scientific name***	**Locations/ Stocks**	**Directed Takes over 5 years (includes collection of sloughed skin)**					**Incidental harassment for all research activities**
		Aerial Photo-grammetry	**Vessel surveys 500 ft**		**Tagging**		
			Biopsy	**Photo ID**	**radio/ TDR**	**satellite**	
Minke whale *Balaenoptera acutorostrata*	Pacific Ocean (U.S. EEZs and ETP)	1,000	500	1,000	--	--	5,000
Bryde's whale *Balaenoptera edeni*	Pacific Ocean (EEZs and ETP)	1,000	500	1,000	125	125	5,000
Arnoux's beaked whale *Berardius arnuxii*	Southern Ocean	--	50	100	--	--	1,000
Baird's beaked whale *Berardius bairdii*	North Pacific	500	50	100	125	125	5,000
Pygmy right whale *Caperea marginata*	Southern Ocean	--	50	100	--	--	1,000
Commerson's dolphin *Cephalorhynchus commersonii*	coasts of South America	--	50	100	--	--	1,000
Chilean dolphin *Cephalorhynchus eutropia*	coast of Chile	--	50	100	--	--	1,000
Hector's dolphin *Cephalorhynchus hectori*	coastal waters of New Zealand	--	100	100	--	--	1,000
Beluga whale *Delphinapterus leucas*	North Pacific, North Atlantic	1,000	250	250	--	--	5,000
Long-beaked common dolphin *Delphinus capensis*	Pacific Ocean (U.S. EEZs and ETP)	50,000	250	1,000	--	--	100,000
Short-beaked common dolphin *Delphinus delphis*	Pacific Ocean (U.S. EEZs and ETP)	50,000	250	1,000	--	--	20,000
Gray whale *Eschrichtius robustus*	Eastern North Pacific	2,500	250	1,000	--	--	5,000
Pygmy killer whale *Feresa attenuata*	Pacific Ocean (U.S. EEZs/ ETP)	1,000	100	500	--	--	5,000
Short-finned pilot whale *Globicephala macrorhynchus*	Pacific Ocean (U.S. EEZs and ETP)	500	100	500	--	30	2,000

Species **Common name** ***Scientific name***	**Locations/ Stocks**	**Directed Takes over 5 years (includes collection of sloughed skin)**					**Incidental harassment for all research activities**
		Aerial Photo-grammetry	**Vessel surveys 500 ft**		**Tagging**		
			Biopsy	**Photo ID**	**radio/ TDR**	**satellite**	
Long-finned pilot whale *Globicephala melas*	Southern Ocean	--	100	500	--	--	2,000
Risso's dolphin *Grampus griseus*	Pacific Ocean (EEZs and ETP)	5,000	100	1000	--	--	5,000
Southern bottlenose whale *Hyperoodon planifrons*	Southern Ocean	--	50	100	--	--	1,000
Longman's beaked whale *Indopacetus pacificus*	Indian Ocean, Pacific Ocean	--	50	100	--	--	1,000
Pygmy sperm whale *Kogia breviceps*	Pacific Ocean (U.S. EEZs and ETP)	50	100	100	--	--	1,000
Dwarf sperm whale *Kogia simus*	Pacific Ocean (U.S. EEZs and ETP)	50	100	100	--	--	1,000
Fraser's dolphin *Lagenodelphis hosei*	Pacific Ocean (U.S. EEZs and ETP)	5,000	100	1000	--	--	10,000
Peale's dolphin *Lagenorhynchus australis*	South American Coasts	--	50	100	--	--	5,000
Hourglass dolphin *Lagenorhynchus cruciger*	Southern Hemisphere	--	50	100	--	--	5,000
Pacific white-sided dolphin *Lagenorhynchus obliquidens*	North Pacific	3,000	250	250	--	--	10,000
Dusky dolphin *Lagenorhynchus obscurus*	Southern Hemisphere	--	50	100	--	--	5,000
Northern right whale dolphin *Lissodelphis borealis*	North Pacific	500	50	500	--	--	10,000
Southern right whale dolphin *Lissodelphis peronii*	Southern Hemisphere	--	50	100	--	--	5,000

Species **Common name** ***Scientific name***	**Locations/ Stocks**	**Directed Takes over 5 years (includes collection of sloughed skin)**					**Incidental harassment for all research activities**
		Aerial Photo-grammetry	**Vessel surveys 500 ft**		**Tagging**		
			Biopsy	**Photo ID**	**radio/ TDR**	**satellite**	
Beaked whales *Mesoplodon* spp.	Pacific Ocean (U.S. EEZs and ETP)	500	250	500	--	--	5,000
Melon-headed whale *Peponocephala electra*	Southern Ocean Pacific Ocean (U.S. EEZs and	1,000	250	250	--	--	5,000
Spectacled porpoise *Phocoena dioptrica*	Southern Hemisphere	--	50	100	--	--	1,000
Harbor porpoise *Phocoena phocaena*	North Pacific, North Atlantic	1,000	100	250	--	--	5,000
Burmeister's porpoise *Phocoena spinipinnis*	South American Coasts	--	50	100	--	--	1,000
Dall's porpoise *Phocoenoides dalli*	North Pacific (Alaska stock)	1,000	250	1,000	--	--	10,000
Dall's porpoise *Phocoenoides dalli*	North Pacific (CA/OR/WA stock)	1,000	250	1,000	--	--	10,000
False killer whale *Pseudorca crassidens*	Southern Ocean Pacific Ocean (U.S. EEZs and ETP)	2,500	500	1,000	--	30	5,000
Pantropical spotted dolphin *Stenella attenuata*	Pacific Ocean (U.S. EEZs and ETP) (offshore, northeastern stock)	50,000	500	5,000	--	--	200,000
Pantropical spotted dolphin *Stenella attenuata*	Pacific Ocean (U.S. EEZs and ETP) (offshore, western/southe rn stock)	50,000	500	5,000	--	--	200,000
Pantropical spotted dolphin *Stenella attenuata grafmani*	Pacific Ocean (U.S. EEZs and ETP) (coastal stock)	50,000	500	5,000	--		200,000

Species **Common name** ***Scientific name***	**Locations/ Stocks**	**Directed Takes over 5 years (includes collection of sloughed skin)**					**Incidental harassment for all research activities**
		Aerial Photo-grammetry	**Vessel surveys 500 ft**		**Tagging**		
			Biopsy	**Photo ID**	**radio/ TDR**	**satellite**	
Striped dolphin *Stenella coeruleoalba*	Pacific Ocean (U.S. EEZs and ETP)	25,000	500	5,000	--	--	100,000
Spinner dolphin *Stenella longirostris longirostris*	Pacific Ocean (U.S. EEZs and ETP) (whitebelly stock)	50,000	500	5,000	--	--	200,000
Spinner dolphin *Stenella longirostris oreinetalis*	Pacific Ocean (U.S. EEZs and ETP) (eastern stock)	50,000	500	5,000	--	--	200,000
Spinner dolphin *Stenella longirostris centroamericana*	Pacific Ocean (U.S. EEZs and ETP) (Central American stock)	50,000	500	5,000	--	--	200,000
Rough-toothed dolphin *Steno bredanensis*	Hawaii stock	1,250	100	500	--	--	5,000
Rough-toothed dolphin *Steno bredanensis*	CA/OR/WA stock	1,250	100	500	--	--	5,000
Shepherd's beaked whale *Tasmacetus shepherdi*	Southern Ocean	--	20	20	--	--	200
Bottlenose dolphin *Tursiops truncatus*	Pacific Ocean (U.S. EEZs and ETP)	25,000	500	5,000	--	--	100,000
Cuvier's beaked whale *Ziphius cavirostris*	Pacific Ocean (U.S. EEZs and ETP)	2500	100	100	--	--	5,000

Table 3A. Killer Whale Takes – the following number of killer whales are taken annually.

Species/Stock	Location	Biopsy	Vessel Survey / Photo ID	Harassment incidental to all research activities
Killer whale (eastern North Pacific Southern Resident) *Orcinus orca*	North Pacific	10	20	20
Killer whale (non-eastern Pacific Southern Resident) *Orcinus orca*	S. Hemisphere, Pac. Ocean (U.S. EEZ and ETP)	130	180	1,000

Appendix 2: LIST OF EXISTING PERMITS AUTHORIZING DIRECTED TAKES FOR THE TARGET ESA-LISTED, LARGE WHALE SPECIES IN THE ACTION AREA.

Researchers authorized takes for sperm and/or humpback whales in the Southern Ocean

Permit No.	**Permit Holder**	**Expiration Date**
1058-1733	Baumgartner	May 31, 2012
808-1735	Read	May 31, 2012
782-1719	NMFS, NMML	June 30, 2009
369-1757	Mate	May 31, 2010

Researchers authorized takes for humpback and/or sperm whales in the Pacific Ocean (N=23)

1000-1617	Au	November 15, 2010
965-1821	Bain	April 14, 2011
731-1774	Baird	April 14, 2011
532-1822	Balcomb	April 14, 2011
540-1811	Cascadia Research Collective	April 14, 2011
753-1599	Darling	June 30, 2009
1071-1770	The Dolphin Institute	June 30, 2010
1120-1898	Eye of the Whale	July 31, 2012
393-1772	Glockner-Ferrari	September 30, 2010
945-1776	Glacier Bay National Park & Preserve	March 31, 2011
369-1757	Mate	May 31, 2010
662-1661	Matkin	June 30, 2009
642-1536	Mobley	June 30, 2009
782-1719	NMFS, NMML	June 30, 2009
781-1824	NMFS, Northwest Fisheries Science Center	April 14, 2011
774-1714	NMFS, SWFSC	June 30, 2009
545-1761	North Gulf Oceanic Society	September 15, 2010
587-1767	Salden	September 30, 2010
716-1705	Sharpe	June 30, 2009
473-1700	Straley	June 30, 2009
1029-1675	Szabo	June 30, 2009
1049-1718	Wynne	June 30, 2009
1039-1699	Zoidis	June 30, 2009

Appendix 3: TOTAL NUMBER OF CURRENT AND PROPOSED TAKES PER ESA-LISTED LARGE WHALE SPECIES IN THE PROPOSED ACTION AREA

The tables below include the number of takes currently authorized by active permits and the number of new takes proposed for each ESA species by geographic study area. The "current" column of the tables below includes takes for all permits currently authorized by NMFS, including one permit that expired Jan. 31, 2008 and takes under the applicant's current Permit No. 774-1714-06, as allocated annually, in the action area (n = 26). The "proposed" column contains the additional takes requested by the SWFSC for Permit No. 774-1714-06 under the proposed action. The requested annual takes would be valid until the permit expires in 2009, essentially for two more seasons of fieldwork.

*Harassment by close approach takes into account all close approaches during vessel and/or aerial surveys for research activities including photo-ID, behavioral observation, passive acoustic recordings, aerial photogrammetry, underwater observation, biopsy sampling, tagging, and incidental harassment. Active acoustic playbacks do not involve close approach.

Species: Humpback (*Megaptera novaeangliae*)	**Location**: Southern Ocean	
	Annual Takes	
Take Activity	Current	Proposed
Harassment during Close Approach*	1,859	300
Biopsy Sampling (includes attempts)	340	40
Biopsy calves < 6 mos. **subset of all biopsy sampling	45	0
Tagging (includes attempts)	223	10
Total	**2,422**	**350**

Species: Humpback (*Megaptera novaeangliae*)	**Location**: Pacific Ocean	
	Annual Takes	
Take Activity	Current	Proposed
Harassment during Close Approach*	38,780	0
Biopsy Sampling (includes attempts)	12,635	0
Biopsy calves < 6 mos. **subset of all biopsy attempts	1,575	0
Tagging (includes attempts)	764	0
Ultrasound	5	0
Breath sample	10	0
Acoustic playback	380	0
Total	**52,574**	**0**

Species: Sperm whale (*Physeter macrocephalus)*	**Location**: Southern Ocean	
	Annual Takes	
Take Activity	Current	Proposed
Harassment during Close Approach*	5,000	300
Biopsy Sampling (includes attempts)	150	20
Biopsy calves < 6 mos. **subset of all biopsy attempts	24	0
Tagging (includes attempts)	30	5
Total	**5,180**	**325**

Species: Sperm whale (*Physeter macrocephalus)*	**Location**: Pacific Ocean	
	Annual Takes	
Take Activity	Current	Proposed
Harassment during Close Approach*	17,960	0
Biopsy Sampling (includes attempts)	2,450	0
Biopsy calves < 6 mos. **subset of all biopsy attempts	225	0
Tagging (includes attempts)	335	0
Total	**20,745**	**0**