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National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

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Environmental Assessment
on the Issuance of an Amendment to Scientific Research Permit No. 10018-01 to Satellite
Tag Humpback Whales in Hawaii

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Resources

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Location: Hawaiian waters and Alaska

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue a major amendment to Scientific Research Permit No. 10018-01, for takes of marine mammals in the wild, under the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.), and the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 et seq.). Permit 10018-01 authorizes harassment during close approach via vessel for photo-identification, focal follows, underwater observations, collection of sloughed skin, and incidental harassment of humpback whales and other non-listed marine mammals in Hawaii and Alaska. The proposed permit amendment would authorize harassment during satellite tagging activities on female-calf pairs and yearling humpback whales in Hawaii. The purposes of the tagging activities are to: 1) verify the impact of research vessels during boat-based behavioral follows, 2) further understand how female-calf pairs use breeding ground habitat, and 3) further document the behavioral dynamics of newly-independent yearlings within breeding regions. The amended permit would expire on June 30, 2013.



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1.0 PURPOSE OF AND NEED FOR ACTION

Proposed Action: In response to an application from Rachel Cartwright, Ph.D., Keiki Kohola Project, Oxnard, California, NMFS proposes to issue an amendment to Scientific Research Permit No. 10018-01 authorizing takes¹ by level A and B harassment² of marine mammals in the wild under the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq.*), and the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq.*).

Purpose of and Need for Action: The MMPA and ESA prohibit “takes” of marine mammals and of threatened and endangered species, respectively, with only a few specific exceptions. The applicable exceptions in this case are an exemption for *bona fide*³ scientific research under Section 104 of the MMPA and for scientific purposes related to species recovery under Section 10(a)(1)(A) of the ESA. The need for issuance of the permit is related to the purposes and policies of the MMPA and ESA. NMFS has a responsibility to implement both the MMPA and the ESA to protect, conserve, and recover marine mammals and threatened and endangered species under its jurisdiction. Facilitating research about species’ basic biology and ecology or that identifies, evaluates, or resolves specific conservation problems informs NMFS management of protected species.

The purpose of the permit amendment is to provide the applicant with an exemption from the take prohibitions under the MMPA and ESA for harassment of marine mammals, including those listed as endangered, during conduct of research that is consistent with the MMPA and ESA issuance criteria.

The applicant’s need for the amendment relates to her desire to modify their research protocols in a manner that would result in additional harassment of marine mammals. The researchers propose revisions to their protocols to add suction-cup tagging of humpback whales (*Megaptera novaengliae*). Additionally, due to reevaluation and separation of stocks in the Hawaiian false killer whale population (*Pseudorca crassidens*), NMFS proposes to change currently authorized takes from the Hawaiian stock to the newly established Hawaiian Insular stock of false killer whales, which have since been listed as endangered under the ESA. These are species for which the current permit already authorizes some level of take by harassment.

The purposes of the proposed amended research activities include: 1) verifying the impact of research vessels during boat based behavioral follows, 2) understanding how female-calf pairs

¹ Under the MMPA, “take” is defined as to “harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect.” 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.”

² “Harass” is defined under the MMPA 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 does not have the potential to injure a marine mammal or marine mammal stock in the wild (Level B harassment).”

³ The MMPA defines bona fide research as “scientific research on marine mammals, the results of which – (A) likely would be accepted for publication in a refereed scientific journal; (B) are likely to contribute to the basic knowledge of marine mammal biology or ecology; or (C) are likely to identify, evaluate, or resolve conservation problems.”

use breeding ground habitat, potentially identifying key resting regions and establishing the degree to which female-calf pairs circulate within vs. move between specific favored female-calf regions, and 3) documenting the behavioral dynamics of newly-independent yearlings within breeding regions of humpback whales.

Scope of Environmental Assessment: This EA focuses on evaluating whether permitting additional harassment of marine mammals, as proposed in the amendment request, would change the manner in which the action may affect the environment compared to the effects documented and analyzed in an Environmental Assessment prepared for issuance of the original permit.

The original analysis, *Final Environmental Assessment on the Issuance of Two Scientific Research Permits for the Harassment of Cetaceans in Hawaiian Waters* (NMFS 2008a), considered the effects of permit issuance on a variety of marine mammals, and on physical and biological features of the action area. The proposed action alternative was issuance of the permit with the terms and conditions that are standard to permits issued by NMFS for harassment of marine mammals, including endangered species.

The 2008 EA summarized the status of the affected species, including seasonal occurrence, population abundance and density, annual productivity. The 2008 EA then evaluated the effects of the research activities themselves, including effects of the potential for stress associated with the close approach of vessels.

The 2008 EA also considered the effects on stocks of the harassment that could result from the research activities. In addition, NMFS considered the effects of the harassment on threatened and endangered marine mammal species, as listed under the ESA, during consultation under section 7 of the ESA. The results of that consultation were summarized in a Biological Opinion, the conclusions of which were incorporated into the final EA.

As noted in the Finding of No Significant Impact signed on June 13, 2008, and based on the analyses in the 2008 EA (and associated Biological Opinion), issuance of the permit would result in minor short-term adverse effects on a specified number of animals targeted by the research, as well as non-target animals in the immediate vicinity of the research⁴, but would not affect other aspects of the human environment. NMFS further concluded that, given the mitigation measures required by the permit, the adverse effects on marine mammals that are the subject of the permit are likely to result only in transitory and recoverable changes in behavior and physiological parameters of the affected animals, including those listed as threatened or endangered, but are not expected to result in measurable effects on populations, stocks, or species.

The 2008 EA considered the effects of other human activities affecting marine mammals in the action area, including entrapment and entanglement in fishing gear, vessel interactions, habitat degradation, anthropogenic noise, and other permits issued by NMFS for research on the same species and stocks. NMFS concluded that issuance of the permit would not result in individually or cumulatively significant impacts.

⁴ Note that the permit authorizes harassment of both marine mammals that are targeted by the research as well as those that may only be affected incidental to it. As such, all marine mammals that may be harassed are considered “target” animals for the permit regardless of whether they are focal/target animals of the research.

The 2008 EA demonstrated that issuance of a permit for harassment of marine mammals would not affect any component of the environment other than the marine mammals themselves. The proposed permit amendment involves harassment of the same species of marine mammals, in the same location, at the same times of year, and with the same frequency as the proposed action in the 2008 EA. This Environmental Assessment (EA) incorporates by reference sections of the 2008 EA, where applicable, as noted in this document.

The analysis in this supplemental EA is limited to effects on humpback whales and the Hawaiian Insular stock of false killer whales, because they are the only two species affected by the amendment. For humpback whales, the new activity not included in the 2008 EA is suction cup tagging of up to 18 female whales annually. Dr. Cartwright's permit already authorizes 24 takes of false killer whales annually. These takes are Level B harassment that can occur incidental to her humpback whale research. Since Dr. Cartwright's permit was originally issued, NMFS has studied and reclassified the stock structure of false killer whales around the Hawaiian Islands. The animals that Dr. Cartwright is likely to encounter, based on her study area, are of the Insular stock. This stock was proposed to be listed as endangered in November 2010; the listing became final in November 2012. Because the endangered listing was pending when the Permits Division was processing the amendment request for humpback tagging, the Permits Division included the false killer whale listing as part of the ESA Section 7 consultation. The amendment does not include increases in numbers or changes to activities with regard to false killer whales.

An accompanying biological opinion (NMFS 2008b) was prepared for this action, which concluded that Permit No. 10018 would not jeopardize any endangered species or destroy or modify any critical habitat.

The National Oceanic and Atmospheric Administration (NOAA), in NOAA Administrative Order 216-6 (NAO 216-6; 1999), lists issuance of permits for research on marine mammals and threatened and endangered species as categories of actions that "do not individually or cumulatively have a significant effect on the human environment..." and which therefore do not require preparation of an EA or environmental impact statement (EIS). A possible exception to the use of these categorical exclusions is when the action may adversely affect species listed as threatened or endangered under the ESA (NAO 216-6 Section 5.05c).

The target species of the applicant's modification request are humpback whales which are listed as endangered under the ESA. There is no evidence from prior analyses⁴ (including in the original 2008 EA) of the effects of permit amendment issuance, or from monitoring reports submitted by permit holders⁵, that issuance of research permit amendments for take of marine mammals listed under the ESA results in adverse effects on stocks or species. Nevertheless,

⁴ Since 2005, NMFS has prepared over 100 EAs for issuance of permits under the MMPA and ESA. In every case, the EA supported a finding of no significant impact regardless of the nature of the permitted take or the status of the species that were the subject of the permit. These EAs were accompanied by Biological Opinions prepared following interagency consultation under section 7 of the ESA and further document that such permits are not likely to adversely affect listed species.

⁵ All NMFS permits for research on marine mammals require submission of annual reports, which include information on responses of animals to the permitted takes.

NMFS prepared this SEA and the original 2008 EA, with a more detailed analysis of the potential for adverse impacts on endangered species resulting from takes of a specified number of individual humpback whales, to assist in making the decision about permit amendment issuance under the MMPA and ESA.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Alternative 1 - No Action (Status Quo): Under the No Action alternative, no amendment would be issued for the proposed tagging activities. The existing permit (No. 10018-01) would remain in effect until it expired on June 30, 2013, allowing takes of marine mammals, including ESA-listed species, by harassment during close approach via vessel for photo-identification, focal follows, underwater observations, collection of sloughed skin, and incidental harassment of humpback whales and other non-listed marine mammals in Hawaii and Alaska. No other permits or permit requests would be affected by this alternative.

Methods: Research protocols that may result in harassment of marine mammals are described in detail in the application on file for this permit and analyzed in the 2008 EA and are briefly summarized here. Currently authorized research activities include close vessel approaches for photo-identification, behavioral observation, tracking, collection of sloughed skin, and incidental harassment.

Close Approach

On approaching calf groups, the vessel would be positioned at least 20 meters from the outer most whale of the group, which confers a distance of up to 50 meters from the calf within the focal group. The speed of the vessel and its direction of travel mirror the movements of the group. Throughout the approach, adjustments to the speed and heading of the vessel are kept to a minimum and made very gradually. The research vessel used would be a motor powered outboard vessel of approximately 8 meters.

Photo-Identification

Fluke identification shots of the mother and any escorts would be obtained and used, along with any marks or distinguishing scars, to re-identify individual mothers. Photo-identification would be collected, along with documentation of the degree of furl of the calf's dorsal fin, from a distance of 30-60 meters.

Focal Follows

Focal follows would be conducted to collect behavioral data, specifically details of naturally occurring patterns of behavior; therefore, every attempt would be made to minimize the impact of these follows. During these follows, behavior is recorded continuously throughout a 60 minute period, with the calf/juvenile as the focal animal, following procedures described by Mann (1999).

Underwater Observations

Underwater observations would be made after the completion of the focal follow. These observations would document orientation, arrangement, and passive recordings of any acoustics

of the mother/calf pairs. The maximum number of divers in the water would be two; one would take still pictures and record the depth of the whale groups (using a standard hand held depth device), while the other would take digital video images. Also, a hydrophone would be lowered to a distance of 10 meters from the whales, in order to document background noise. The hydrophone used would be the C54 XRS hydrophone, designed by Cetacean Research, comprised of a single, receive only transducer, directly encapsulated in a 13 cm x 2.5 cm polyurethane canister, suspended on a cable of 0.5 mm diameter.

Collection of Sloughed Skin

Sloughed skin would be collected opportunistically, from the water column within footprints and from behind surfacing animals for use in possible subsequent genetic analysis. Samples would be stored in DMSO/salt and then frozen.

Duration: Permit No. 10018-01 authorizes harassment of marine mammals for a period of five years, beginning on the date of issuance and ending upon permit expiration on June 30, 2013. Harassment of marine mammals resulting from the research may occur during field seasons that run year-round.

Target species or stocks: The current permit (No. 10018-01, Table 1) exempts harassment of humpback whales and other non-listed marine mammals in Hawaii and Alaska during conduct of bona fide scientific research.

Table 1. Takes currently authorized under Permit No. 10018-01

Species	Stock	Age	Sex	Number	Harassment	Other	
Whale, humpback	Range-wide (NMFS Endangered)	Calf	Male and Female	120	Harass	Collect, sloughed skin; Observations, behavioral; Photo-id; Underwater photo/videography	
Whale, humpback	Range-wide (NMFS Endangered)	Adult/Juvenile	Male and Female	420	Harass	Collect, sloughed skin; Observations, behavioral; Photo-id; Underwater photo/videography	
Dolphin, bottlenose	Hawaiian Stock	All	Male and Female	12	Harass	Incidental harassment	
Dolphin, spinner	Hawaiian Stock	All	Male and Female	48	Harass	Incidental harassment	
Dolphin, pantropical spotted	Hawaiian Stock	All	Male and Female	48	Harass	Incidental harassment	

false killer whales (<i>Pseudorca crassidens</i>)	Hawaiian stock	All	Male and Female	24	Harass	Incidental harassment	
Whale, pilot, short-finned	Hawaiian stock	All	Male and Female	24	Harass	Incidental harassment	
Whale, humpback	Range-wide (NMFS Endangered)	Adult/Juvenile	Male and Female	108	Harass	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo	Alaskan Waters; May - September
Whale, humpback	Range-wide (NMFS Endangered)	Adult	Female	54	Harass	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo	Alaskan Waters; May - September
Whale, humpback	Range-wide (NMFS Endangered)	Calf	Male and Female	54	Harass	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo	Alaskan Waters; May - September
Whale, humpback	Range-wide (NMFS Endangered)	Juvenile	Male and Female	54	Harass	Acoustic, passive recording; Count/survey; Observations, behavioral; Photo	Alaskan Waters; May - September
Dolphin, Pacific white-sided	North Pacific Stock	All	Male and Female	26	Harass	Acoustic, passive recording; Count/survey; Incidental harassment	Alaskan Waters; May - September
Porpoise, harbor	Southeast Alaska Stock	All	Male and Female	90	Harass	Acoustic, passive recording; Count/survey; Incidental harassment	Alaskan Waters; May - September
Porpoise, Dall's	Alaska Stock	All	Male and Female	270	Harass	Acoustic, passive recording; Count/survey; Incidental harassment	Alaskan Waters; May - September
Whale, killer	Eastern North Pacific Northern	All	Male and Female	34	Harass	Acoustic, passive recording; Count/survey;	Alaskan Waters; May - September

			SD	AUTHORIZED TAKE	TIME ACTION	PROHIBITION	
	Resident Stock					Incidental harassment	
Whale, killer	Eastern North Pacific Transient stock	All	Male and Female	15	Harass	Acoustic, passive recording; Count/survey; Incidental harassment	Alaskan Waters; May - September

Alternative 2 - Proposed Action (Issuance of Amended Permit with Standard Conditions):

Under the Proposed Action alternative, a new permit (No. 10018-02) that amends and replaces the current permit would be issued to exempt the applicant from MMPA and ESA take prohibitions during conduct of research that is consistent with the purposes and policies of the MMPA and ESA and applicable permit issuance criteria.

The request to amend the permit includes deploying suction-cup tags to maternal female humpback whales for short durations (48 hours to 2 weeks) in Hawaii only. Some whales may be re-tagged between the first and second tagging period.

The results of this study would provide new information on the behavioral ecology (patterns of habitat use, range, and vessel response) of mother-calf pairs and newly independent juvenile whales and provide very valuable information on potential changes in maternal movement patterns over the course of the ontogeny of the calf.

Methods: All currently authorized research activities (i.e., close vessel approaches, and associated Level B activities: photo-identification, behavioral observation, tracking, collection of sloughed skin, and incidental harassment) would occur as previously described and analyzed in the 2008 EA. Dr. Cartwright is requesting Level A harassment of humpback whales in Hawaiian waters during satellite tagging. Following is a description of these techniques and the circumstances under which each method would be used.

Suction-cup satellite tagging

Maternal females (i.e. females accompanied by a calf) would be tagged with short term suction-cup tags following protocols described by Baird et al. 2000, incorporating updated tag design and software. The tags to be used are 10cm x 10cm x 2cm, weigh less than 100g, and are equipped with a short antennae (<10cm), and an 8 cm diameter suction-cup mount (Figure 1). The suction-cup would be fastened to the animal and a release mechanism would be included to ensure subsequent detachment. Initial tags would be set to detach within a 24 hour period. Once results have been verified and the impact of the tag ascertained, tags would be set to remain attached for periods up to 2 weeks, which is the maximum estimated duration of attachment/battery life. Detachment of the tags would occur by the corrosion of a release mechanism.

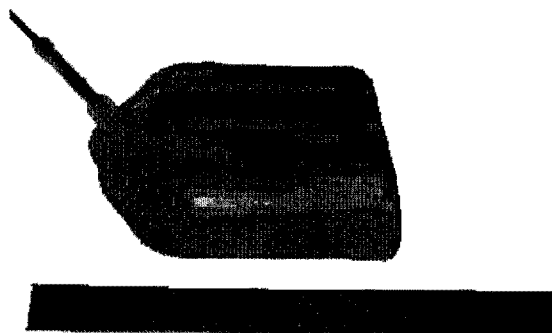


Figure 1. Proposed suction-cup tag.

The tags would be deployed using either a crossbow as this allows for deployment from a greater distance to the animals or a 7m carbon pole as this allows for more successful placement of the tags. When using a crossbow, the tags would be deployed from a distance of approximately 10m. When using the pole, the tags would be deployed from a distance of 7m. The tag would be located level with the base of the dorsal fin and 10-30cm in front of the dorsal fin. This region would allow for most frequent signal transmittance, but would minimize any possible impact that the tag may have on the female or her calf. The tag would be placed on the focal animal while it is travelling since the placement of the calf relative to the female is more predictable during travelling. After deployment of the tags, behavioral monitoring would continue for an additional 30 minutes. The entire tagging protocol and associated evaluation of the tag would occur within a 2 hour time period.

Researchers would monitor patterns of movement, speed of travel and dive profile to detect any impact of the tags by conducting behavioral follows before, during and after placement of the tag, following previously outlined protocols already covered under Permit 10018-01. Where groups appear settled and behavior is predictable, underwater photography (also authorized under Permit 10018-01) would be used to document the tag placement. This would allow the researchers to evaluate the response of the mother/calf pair to the presence of the tag.

Researchers would only tag females with calves that are classified as stage 2 calves (~1.5 to 2 months old) or older and would position the tag to minimize the likelihood of contact during resting or travel periods or during nursing. Based on the researchers experience over the last 9 years studying female-calf pairs, they have found that the behavior of calves vary with age (Cartwright 2005; Cartwright and Sullivan 2009). Younger, stage 1 calves travel more frequently alongside the eye of the female and are slightly higher in the water. When stage 1 calves are resting, they may occasionally rest or roll over the rostrum of the female, which could bring them into contact with the tag. In stage 2 calves, swimming position is just trailing the female's pectoral fin. For stage 2 calves, resting over the rostrum of the female is rare and since they have the capacity to hold their breath for a more extended amount of time than stage 1 calves, they typically rest below the female (Cartwright and Sullivan 2009). Based on re-sights of the same calf as they progress from stage 1 to stage 2, the researchers estimate that stage 2 calves are between 3 and 4 weeks older than stage 1 calves. These age estimates are based on the development of stage 2 calves' breathing capacity, as well as the changes in the furl of the dorsal fin (Cartwright 2005; Cartwright and Sullivan 2009).

Duration: The amendment would not affect the expiration date of the permit and would therefore not extend the duration of the temporal scope of the action. The permit amendment would expire on June 30, 2013.

The applicant has not proposed a change in the time of year or frequency of their research, and the amendment would not change when or how often the harassment of marine mammals would occur.

Target species or stocks: Due to NMFS' reevaluation of stocks for the Hawaiian false killer whales, the amendment would change currently authorized takes from the Hawaiian stock to the newly established Hawaiian Insular stock of false killer whales, which is proposed to be listed as endangered under the ESA. Otherwise, the amendment does not change the species or stocks of marine mammals that may be harassed. The affected species and stocks of marine mammals are the same as listed in the No Action alternative.

Table 2. Changes in bold are proposed as part of this amendment.

false killer whales (<i>Pseudorca crassidens</i>)	Hawaiian stock	All	Male and Female	24	Harass	Incidental harassment	Insular Hawaiian Stock – listed as endangered in Nov 2012
Whale, humpback	Range-wide (NMFS Endangered)	Adult	Female	36	Harass/ Sample	Collect, sloughed skin; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Underwater photo/videography	Maternal females, accompanied by a calf; no more than 18 successful tags and up to 2 attempts per animal

3.0 AFFECTED ENVIRONMENT

Location

Research would occur within the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS). A description of the physical and biological environment of the action area can be found in Chapter 3 of the 2008 EA. The harassment of marine mammals would occur at the time and in the place where the study is conducted. Thus, the action area for the proposed permit is the same as the research study area.

The permitted takes of marine mammals do not affect other components of the environment. Thus, the action area is effectively limited to the locations where the research occurs, or, more

specifically, to where the marine mammals are at the time they are approached for tagging, observations, or sound exposures.

Status of Affected Species

Non-ESA listed marine mammals: Descriptions of these stocks can be found in Chapter 3 of the 2008 EA. In addition, the most current information on distribution, abundance, productivity, and human-caused mortality for these stocks is available in NMFS Stock Assessment reports. These reports are available at <http://www.nmfs.noaa.gov/pr/sars/species.htm#>. The amendment does not change the species or stocks of non-ESA listed marine mammals that may be harassed.

ESA-listed marine mammals: Description of humpback whales, that are the subject of the permit amendment, can be found in Chapter 3 of the 2008 EA. As with non-ESA species, the most current estimates of abundance, productivity, and human-caused mortality for these species are available in NMFS Stock Assessment reports, which are available at <http://www.nmfs.noaa.gov/pr/sars/species.htm#>.

Hawaiian Insular stock of false killer whales: NMFS proposed (75 FR 70169; 11/17/2010) that the Hawaiian Insular stock of false killer whales is a distinct population segment and should be listed as endangered under the ESA. The listing as endangered was finalized on November 29, 2012 (77 FR 71260). Thus, for this analysis it was treated as if it is listed under the ESA.

Within waters of the central Pacific, four Pacific Islands Region management stocks of false killer whales are currently recognized for management under the MMPA: the Hawaii Insular stock, the Hawaii pelagic stock, the Palmyra Atoll stock, and the American Samoa stock (Carretta et al., 2010).

Hawaiian Insular false killer whales share a portion of their range with the genetically distinct pelagic population (Forney et al., 2010). Therefore, the draft 2010 Stock Assessment Report (SAR) for false killer whales recognizes an overlap zone between insular and pelagic false killer whales between 40 km and 140 km from the main Hawaiian Islands based on sighting, telemetry, and genetic data (based on justification in Forney et al., 2010; Carretta et al., 2010 as well as the original boundary recommendation of Chivers et al. (2008). Individuals utilize habitat overlaying a broad range of water depths, varying from shallow (<50m) to very deep (>4,000m) (Baird et al., 2010).

The draft 2010 SAR for Hawaiian Insular false killer whales (Carretta et al., 2010) gives the best estimate of current population size as 123 individuals (coefficient of variation, or CV = 0.72), citing Baird et al. (2005). The large group sizes observed in 1989, together with the declining encounter rates from 1993 through 2003 suggest that Hawaiian Insular false killer whales have declined substantially in recent decades.

NMFS has determined that Hawaiian Insular false killer whales are discrete from other false killer whales based on genetic discontinuity and behavioral factors (the uniqueness of their behavior related to habitat use patterns). NMFS has also determined that Hawaiian insular false

killer whales are significant to the taxon, based on their unique ecological setting, marked genetic characteristic differences, and cultural factors.

The amendment would increase the numbers of individuals harassed for humpback whales and change currently authorized takes of false killer whales from the Hawaiian stock to the Hawaiian Insular stock.

Non-target species

In addition to the marine mammal species that are the target of the proposed permit, the action area is home to a variety of sea birds and numerous fish species. The harassment of marine mammals that may result from the proposed permit would not affect sea birds, fish, or other non-target animals. Thus, effects on species that are not the subject of the permit will not be considered further.

Biodiversity and Ecosystem Function

The proposed action does not interfere with benthic productivity, predator-prey interactions, or other biodiversity or ecosystem functions. Marine mammals will not be removed from the ecosystem or displaced from habitat, nor will the permitted taking affect their diet or foraging patterns. Further, the proposed action does not involve activities known or likely to result in the introduction or spread of non-indigenous species, such as ballast water exchange or movement of vessels among water bodies. Thus, effects on biodiversity and ecosystem function will not be considered further.

Ocean and Coastal Habitats

The proposed action does not affect habitat. It does not involve alteration of substrate, movement of water or air masses, or other interactions with physical features of ocean and coastal habitat. Thus, effects on habitat will not be considered further.

Unique Areas

There are no historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers within the action area, which is limited to coastal and open waters in which no such areas occur. Section 3.2 of the 2008 EA describes the Marine Protected Areas, marine managed areas, essential fish habitat, and ESA designated critical habitat that occur in or near the action area. The proposed action does not alter or affect any components of such protected areas, including EFH or elements of any critical habitat. Thus, effects on such unique areas will not be considered further.

Historic Places, Scientific, Cultural, and Historical Resources

There are no districts, sites, highways or structures listed in or eligible for listing in the National Register of Historic Places in the action area. The proposed action is an undertaking that does not have the potential to cause effects on historic properties. The proposed action represents non-consumptive use of marine mammals and does not preclude their availability for other scientific, cultural, or historic uses. Thus, effects on such resources will not be considered further.

Social and Economic Resources

The proposed action does not affect distribution of environmental burdens, access to natural or depletable resources or other social or economic concerns. It does not affect traffic and transportation patterns, risk of exposure to hazardous materials or wastes, risk of contracting disease, risk of damages from natural disasters, food safety, or other aspects of public health and safety. Thus, effects on such resources will not be considered further.

4.0 ENVIRONMENTAL CONSEQUENCES

Effects of the No Action Alternative

The effects of the No Action Alternative, in which NMFS does not issue the permit amendment, are the same as the effects of issuing the original permit. The original permit includes harassment takes of the same pinnipeds, toothed and baleen whales, by the same methods proposed for the permit amendment, in the same locations, at the same times of year, and with the same frequency. The effects of issuing the original permit were discussed and evaluated in the 2008 EA. Based on that EA, NMFS issued a Finding of No Significant Impact and concluded that permit issuance would not significantly impact the quality of the human environment and that preparation of an Environmental Impact Statement was not necessary.

The effects of the currently authorized research activities (i.e., close vessel approaches, and associated Level B activities: photo-identification, behavioral observation, tracking, collection of sloughed skin, and incidental harassment) would occur as previously described and analyzed for Permit No. 10018-01 in the 2008 EA. The greatest effect of the aforementioned activities is the close approach of the animals.

While there may be adverse effects on individual marine mammals harassed by the research, the harassment is not likely to result in adverse effects on the stocks or populations. The number of marine mammals affected represents a small portion of the individual stocks and populations and the effects are expected to be minor and short-term.

For all of the research activities involving close approach, NMFS concludes that, based on published information on the effects of these activities on cetaceans, unpublished reports from previous research conducted by permit holders, and expert advice of agency marine mammal biologists, close vessel approaches for these research activities, considered individually and as a group, are not likely to disrupt the migration, breathing, nursing, feeding, breeding, or sheltering behavior of marine mammals. These factors were considered in the analysis of effects in the 2008 EA. The annual reports submitted by the permit holder at the conclusion of the 2008-2011 field seasons confirmed that the responses of animals to the research were as predicted in that analysis.

The mitigation measures incorporated into the methods are intended to minimize the potential for adverse impacts and mitigate the extent of any unavoidable adverse impacts. Researchers are required to submit annual reports in which they must provide an accounting of the numbers of marine mammals encountered and observed effects of the research. NMFS can revoke, suspend

or modify the permit if there is reason to believe the research is having or has the potential to have an adverse effect on a stock or species.

For issuance of the original permit, NMFS determined that the take of marine mammals results in recoverable, short-term impacts on individual marine mammals targeted by the research. Those effects on individual animals, because they are temporary and not biologically significant, do not result in adverse effects on marine mammal stocks, populations, or species. Further, authorizing such take of marine mammals does not adversely affect other aspects of the human environment, including land, air, or water resources.

Effects of the Proposed Permit Alternative

Under the Proposed Action alternative, Hawaiian Insular false killer whales and a number of additional humpback whales, as specified in Table 2, would be harassed during research. The false killer whales would only experience incidental harassment that is expected to result in no or very short term disturbance. For species and research activities that are already authorized by the permit, the 2008 EA contains a discussion on effects. It concluded that, based on published information on the effects of the activities on cetaceans, unpublished reports from previous research conducted by permit holders, and expert advice of agency marine mammal biologists, close vessel approaches for the research activities, considered individually and as a group, are not likely to disrupt the migration, breathing, nursing, feeding, breeding, or sheltering behavior of marine mammals.

Because the proposed amendment would only target individual whales, NMFS does not expect the Proposed Action to impact other (non-target) species. The following discussion, therefore, focuses on the impacts of the proposed research to humpback whales, the species for which takes are proposed.

Level A harassment, as defined by the MMPA, would occur during tagging activities, when physical contact is made that has the potential to injure animals. Actual injury would be minimized by conditions of the permit limiting how sampling and attachment of tags may occur, such as avoiding sensitive areas of the body and sterilizing dart tags in a multi-step process to minimize the risk of infection.

The effects of level A harassment resulting from the use of suction cup tag types to be used for this action were fully analyzed in the EA for Southwest Fisheries Science Centers permits (File Nos. 774-1714 and 14097, NMFS 2004 and 2010). In these, NMFS determined that, in addition to any Level B harassment resulting from the close approach to attach tags:

- ▶ Suction cup attachments would be short-term (generally less than one day), and could be dislodged by the animal by maneuvering rapidly, breaching, or rubbing against a solid surface.
- ▶ The suction cup assembly could migrate along the skin of the whale, but because the tag would be attached caudal to the blowhole, movement would be toward the fluke of the animal and therefore would create no danger that the tag would cover the blowhole.
- ▶ The proportion of the suction cup assembly to the animal's size and weight would be such that any additional energetic demand created by hydrodynamic drag would likely be insignificant.

- ▶ None of the attachment types would be likely to injure individuals or elicit more than a minimal, short-lived response from whales.

The effects analyses in these EA's are hereby incorporated by reference.

Impacts of satellite tag types were found not to be significant, with the majority of effects (responses) occurring during the tagging event due to vessel approach and tag attachment and causing no more than short-term disturbance of animals (NMFS 2004, 2010). Analysis of photographs collected post-tagging, indicate that long term effects are scarring along with some tissue inflammation. There was no indication of infection or necrosis as expected based on prior studies of cetacean skin healing processes (Bruce-Allen and Geraci 1985; Geraci and Bruce-Allen 1987). The wounds associated with tagging fell within the range of naturally sustained tissue damage from sources such as cookie cutter sharks, remoras, conspecifics, etc., which are commonly documented in healthy, reproductive cetaceans (McSweeney et al. 2007, Walker and Hanson 1999; McCann 1974; Heithouse 2001). Suction cup tags do not penetrate the skin and the behavioral reaction to the approach and attachment are considered the primary effect of the action.

It is likely that the use of a suction-cup tag on mothers to remotely record calf behavior may result in a lower overall level of disturbance than continuous behavioral tracking of mother-calf pairs by a research vessel. Behavioral observations through focal animal follows are frequently on the order of hours in duration. The length of time during which the tagging vessel is close to the focal animal is brief in comparison, and yet can yield many hours of precise behavioral data that would not be influenced by the nearby presence of a research vessel. Clapham and Mattila (1993) documented that humpback whale mothers with calves present showed the least reaction to biopsy darting of all age/sex classes, so it is unlikely that mothers of older calves will react negatively to tagging events themselves. Mothers and calves routinely engage in tactile interaction, which is likely to decrease the startle factor when a tag is attached.

There is no evidence that responses of individual whales would exceed short-term stress and discomfort. No long-term effects would be anticipated. The activities would not be expected to have any additional effects that were not previously analyzed. The short-term behavioral responses that might result from research activities would not likely lead to mortality, serious injury, or disruption of essential behaviors such as feeding, mating, or nursing, to a degree that the individual's likelihood of successful reproduction or survival would be substantially reduced. In addition, conditions and mitigation measures would be placed in the permit to further limit the potential for negative effects from these activities.

In accordance with Section 7 of the ESA, a Biological Opinion was prepared and after reviewing the current status of listed resources, the environmental baseline for the action area, the anticipated effects of the proposed activities, and the cumulative effects, it is the NMFS' opinion and conference opinion that the activities authorized by the proposed action of issuing permit modification No. 10018-02, as proposed, is not likely to jeopardize the continued existence of humpback whales under NMFS' authority and Insular Hawaiian false killer whales, recently listed under the ESA.

Cumulative Impacts

Cumulative effects are defined as those that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time. There may already be substantial adverse impacts on marine mammals from the existing levels of human activities. However, the relative incremental effect of the proposed action would not be significant.

The proposed action would not have a significant cumulative effect on either the human or marine environment. The proposed action would be directed at humpback whales and would similarly not be likely to have a significant cumulative effect on target and non-target species. Tag attachments and other research activities are not expected to have any long-term effect on an individual, or population level impacts. Based on this and the analysis in the 2008 and 2010 EA's, it is highly unlikely that activities carried out by the researchers under the proposed amendment would have significant cumulative impacts when considered with other factors affecting humpback whales.

5.0 MITIGATION MEASURES

In addition to the mitigation measures identified by the applicant and described in this EA, mitigation measures from the original permit, as it was subsequently amended, would remain. There are no additional mitigation measures beyond those that are part of the applicant's protocols or conditions that would be required by permit. The applicant's protocols are incorporated into the permit by reference.

In summary, the permit conditions limit the level of take and require notification, coordination, monitoring, and reporting. Although injury and mortality are not expected, if they occur due to authorized the authorized actions, the permit contains measures requiring researchers to cease activities until protocols have been reviewed and revised with NMFS.

Review of monitoring reports of previous permits for the same or similar research protocols indicate that these types of mitigation measures are effective at minimizing stress, pain, injury, and mortality associated with takes.

6.0 LIST OF PREPARERS AND AGENCIES CONSULTED

Prepared By

This document was prepared by the Permits and Conservation Division of NMFS' Office of Protected Resources in Silver Spring, Maryland.

No other persons or agencies were consulted in the preparation of this document.

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