NATIONAL MARINE FISHERIES SERVICE
ENDANGERED SPECIES ACT SECTION 7
BIOLOGICAL OPINION

Title: Biological Opinion on the Issuance of Permit No. 20311 to the National Marine Fisheries Service, Pacific Islands Fisheries Science Center for Research on Cetaceans

Consultation Conducted By: Endangered Species Act Interagency Cooperation Division, Office of Protected Resources, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce

Action Agencies: Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service

Pacific Islands Fisheries Science Center, National Marine Fisheries Service

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1 INTRODUCTION

The Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 et seq.) establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat they depend on. Section 7(a)(2) of the ESA requires Federal agencies to insure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitat. Federal agencies must do so in consultation with the National Marine Fisheries Service (NMFS) for threatened or endangered species (ESA-listed), or designated critical habitat that may be affected by the action that are under NMFS jurisdiction (50 C.F.R. §402.14(a)). If a Federal action agency determines that an action "may affect, but is not likely to adversely affect" endangered species, threatened species, or designated critical habitat and NMFS concurs with that determination for species under NMFS jurisdiction, consultation concludes informally (50 C.F.R. §402.14(b)).

Section 7(b)(3) of the ESA requires that at the conclusion of consultation, NMFS provides an opinion stating whether the Federal agency's action is likely to jeopardize ESA-listed species or destroy or adversely modify designated critical habitat. If NMFS determines that the action is likely to jeopardize ESA-listed species or destroy or adversely modify critical habitat, NMFS provides a reasonable and prudent alternative that allows the action to proceed in compliance with section 7(a)(2) of the ESA. If incidental take is expected, section 7(b)(4) requires NMFS to provide an incidental take statement that specifies the impact of any incidental taking and includes reasonable and prudent measures to minimize such impacts and terms and conditions to implement the reasonable and prudent measures.

The action agencies for this consultation are NMFS, Office of Protected Resources, Permits and Conservation Division (hereafter the Permits Division), the lead action agency, and NMFS, Pacific Islands Fisheries Science Center (PIFSC), the permit applicant. The Permits Division proposes to issue a scientific research permit (Appendix A) pursuant to section 10(a)(1)(A) of the ESA and section 104 of the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 USC 1361 et seq.) to PIFSC, 1845 Wasp Boulevard, Building 176, Honolulu, Hawaii 96818. The purpose of the proposed permit is to allow an exception to the moratoria and prohibition on takes established under the ESA and MMPA in order to allow the applicant to conduct scientific research on cetaceans (both ESA-listed and non-ESA-listed).

Under the ESA take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct." Harm is defined by regulation (50 C.F.R. §222.102) as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." NMFS does not have a regulatory definition of "harass." We rely on our interim guidance, which interprets harass as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral

patterns which include, but are not limited to, breeding, feeding, or sheltering" (NMFSPD 02-110-19).

Under the MMPA, take is defined as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal" (16 U.S.C. 1361 et seq.) and further defined by regulation (50 C.F.R. §216.3) as "to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill any marine mammal. This includes, without limitation, any of the following:

- the collection of dead animals, or parts thereof
- the restraint or detention of a marine mammal, no matter how temporary
- tagging a marine mammal
- the negligent or intentional operation of an aircraft or vessel
- the doing of any other negligent or intentional act which results in disturbing or molesting a marine mammal
- feeding or attempting to feed a marine mammal in the wild"

For purposes of this action, harassment is defined under the MMPA as any act of pursuit, torment, or annoyance which:

- has the potential to injure a marine mammal or marine mammal stock in the wild (Level A Harassment); or
- has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B Harassment). Under NMFS regulation, Level B harassment does not include an act that has the potential to injure a marine mammal or marine mammal stock in the wild.

This consultation, biological opinion, and incidental take statement, were completed by NMFS Office of Protected Resources Endangered Species Act Interagency Cooperation Division (hereafter referred to as "we") in accordance with section 7(a)(2) and 7(b) of the statute (16 U.S.C. 1536 (a)(2)), associated implementing regulations (50 C.F.R. §402), and agency policy and guidance.

This document represents NMFS opinion on the effects of the proposed issuance of Permit No. 20311 on blue whales (*Balaena musculus*), false killer whales (*Pseudorca crassidens,* Main Hawaiian Islands Insular Distinct Population Segment (DPS)), fin whales (*Balaena physalus*), humpback whales (*Megaptera novaeangliae*, Western North Pacific DPS), North Pacific right whales (*Eubalaena japonica*), sei whales (*Balaena borealis*), sperm whales (*Physeter macrocephalus*), Hawaiian monk seals (*Neomonachus schauinslandi*), green turtles (*Chelonia mydas,* Central North Pacific, Central West Pacific, East Indian-West Pacific, and Central South Pacific DPSs), hawksbill turtles (*Eretmochelys imbricata*), leatherback turtles (*Dermochelys coriacea*), loggerhead turtles (*Caretta caretta*, North Pacific and South Pacific DPSs), and olive ridley turtles (*Lepidochelys olivacea*, Mexico's Pacific Coast Breeding and All other areas). A

complete record of this consultation is on file at NMFS Office of Protected Resources in Silver Spring, Maryland.

1.1 Background

The PIFSC was established as a separate NMFS science center in 2003. Prior to that and in subsequent years, PIFSC conducted cetacean research under several research permits issued to NMFS Southwest Fisheries Science Center (SWFSC) (Permit Nos. 0774–1437 (1998–2004), 774–1714 (2004–2010), 14097 (2010–2016)). In 2012, PIFSC obtained their own permit (Permit No. 15240) to conduct research on cetaceans in the Pacific Ocean, and the proposed permit being considered here (Permit No. 20311) is a renewal of this permit. Since PIFSC research is long-term in nature, the activities that would be authorized under the proposed Permit No. 20311 (Section 3) are the same or similar to those PIFSC has been permitted to conduct previously. Such activities include aerial surveys, vessel surveys, close approaches, and documentation, the export and import of parts, biological sampling, and tagging. Previous consultations considering permits to authorize PIFSC and the SWFSC to conduct these activities all resulted in biological opinions concluding that the issuance of the research permits was not likely to jeopardize the continued existence of ESA-listed species, nor destroy or adversely modify designated critical habitat (NMFS 2010a; NMFS 2012b). In this consultation, we rely on our long-term evaluation of PIFSC research activities from these previous consultation, but here consider these previous permits as part of the environmental baseline (Section 7), and evaluate the effects of authorizing PIFSC to continue to conduct the research under Permit No. 20311.

1.2 Consultation History

This biological opinion is based on information provided in the applicant's permit application (NMFS 2017b), correspondence and discussions with the Permits Division and the applicant, previous biological opinions for research permits for PIFSC and other similar research activities (NMFS 2010a; NMFS 2012b; NMFS 2016a; NMFS 2017a), annual reports from PIFSC's previous research (NMFS 2016e), and the best scientific and commercial data available from the literature. Our communication with the Permits Division regarding this consultation is summarized as follows:

- On February 23, 2017, the Permits Division provided us a copy of the initial permit application and asked for our review.
- On March 22, 2017, we provided our review of the initial application, requesting additional information and clarification from the applicant and the Permits Division.
- On March 27, 2017, the Permits Division sent us a memorandum and initiation package requesting formal consultation on the issuance of Permit No. 20311. We briefly reviewed the package this day and determined it was missing several attachments.
- On March 30, 2017, we met with the Permits Division to discuss the initiation package and clarify the addition information and clarification we required. At this time, it was

unclear whether the proposed action would involve research within the territorial seas of foreign countries.

- On March 31 2017, the Permits Division provided some of the additional information and clarification we requested from the applicant.
- On April 5 and 20, 2017, the Permits division provided the remaining additional information and clarification, including confirmation that research may occur within and across the territorial seas of several foreign countries.
- On Aril 25, 2017, we sent the Permits Division a memorandum informing them that we initiated formal consultation as of as of March 27, 2017.
- On May 18, 2017, we requested more information from the Permits Division and PIFSC on the proposed sterilization procedures for biopsy sampling and invasive tagging, including a copy of PIFSC's approved Institutional Animal Care and Use Committee protocol which we received that day.
- On May 22, 2017, we sent the Permits Division a draft *Description of the Proposed Action* for their review, with several questions regarding biopsy and tagging sterilization procedures.
- On June 12, 2017, the Permits Division provide us additional information regarding sterilization procedures, including an updated draft permit. At this time, we requested additional clarification on the proposed sterilization procedures.

2 THE ASSESSMENT FRAMEWORK

Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species; or adversely modify or destroy their designated critical habitat.

"Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of an ESA-listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. §402.02.

"Destruction or adverse modification" means a direct or indirect alteration that appreciably diminishes the value of designated critical habitat for the conservation of an ESA-listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features (50 C.F.R. §402.02).

An ESA section 7 assessment involves the following steps:

Description of the Proposed Action (Section 3), *Interrelated and Interdependent Actions* (Section 4), and *Action Area* (Section 5)*:* We describe the proposed action, identify any interrelated and interdependent actions, and describe the action area with the spatial extent of those stressors.

Status of Endangered Species Act Protected Resources (Section 6): We identify the ESA-listed species and designated critical habitat that are likely to co-occur with those stressors in space and time and evaluate the status of those species and habitat. In this Section, we also identify those *Species and Designated Critical Habitat Not Likely to be Adversely Affected* (Section 6.1), because these resources are not likely to be adversely affected.

Environmental Baseline (Section 7): We describe the environmental baseline in the action area including past and present impacts of Federal, state, or private actions and other human activities in the action area, anticipated impacts of proposed Federal projects that have already undergone formal or early section 7 consultation, and impacts of state or private actions that are contemporaneous with the consultation in process.

Effects of the Action (Section 8): We identify the number, age (or life stage), and gender of ESA-listed individuals that are likely to be exposed to the stressors and the populations or subpopulations to which those individuals belong. We also consider whether the action "may affect" designated critical habitat. This is our exposure analysis. We evaluate the available evidence to determine how individuals of those ESA-listed species are likely to respond given their probable exposure. We also consider how the action may affect designated critical habitat. This is our response analyses. We assess the consequences of these responses of individuals that are likely to be exposed to the populations those individuals represent, and the species those populations comprise. This is our risk analysis. The adverse modification analysis considers the impacts of the proposed action on the essential habitat features and conservation value of designated critical habitat.

Cumulative Effects (Section 9): Cumulative effects are the effects to ESA-listed species and designated critical habitat of future state or private activities that are reasonably certain to occur within the action area 50 C.F.R. §402.02. Effects from future Federal actions that are unrelated to the proposed action are not considered because they require separate ESA section 7 compliance.

Integration and Synthesis (Section 10): In this section, we integrate the analyses in the opinion to summarize the consequences to ESA-listed species and designated critical habitat under NMFS' jurisdiction.

Conclusion (Section 11); With full consideration of the status of the species and the designated critical habitat, we consider the effects of the action within the action area on populations or subpopulations and on essential habitat features when added to the environmental baseline and the cumulative effects to determine whether the action could reasonably be expected to:

- Reduce appreciably the likelihood of survival and recovery of ESA-listed species in the wild by reducing its numbers, reproduction, or distribution, and state our conclusion as to whether the action is likely to jeopardize the continued existence of such species; or

- Appreciably diminish the value of designated critical habitat for the conservation of an ESA-listed species, and state our conclusion as to whether the action is likely to destroy or adversely modify designated critical habitat.

If, in completing the last step in the analysis, we determine that the action under consultation is likely to jeopardize the continued existence of ESA-listed species or destroy or adversely modify designated critical habitat, then we must identify a reasonable and prudent alternative(s) to the action, if any, or indicate that to the best of our knowledge there are no reasonable and prudent alternatives. See 50 C.F.R. §402.14.

In addition, we include an incidental take statement (Section 12) that specifies the impact of the take, reasonable and prudent measures to minimize the impact of the take, and terms and conditions to implement the reasonable and prudent measures. ESA section 7 (b)(4); 50 C.F.R. §402.14 (i). We also provide discretionary conservation recommendations (Section 13) that may be implemented by the action agency. 50 C.F.R. §402.14 (j). Finally, we identify the circumstances in which reinitiation of consultation is required (Section 14). 50 C.F.R. §402.16.

To comply with our obligation to use the best scientific and commercial data available, we collected information through searches of *google scholar*, *web of science*, literature cited sections of peer reviewed articles, species listing documentation, and reports published by government and private entities. This opinion is based on our review and analysis of various information sources, including:

- Information submitted by the Permits Division and the applicant
- Government reports (including NMFS biological opinions and stock assessment reports)
- National Oceanic and Atmospheric Administration (NOAA) technical memos
- Peer-reviewed scientific literature

These resources were used to identify information relevant to the potential stressors and responses of ESA-listed species and designated critical habitat under NMFS' jurisdiction that may be affected by the proposed action to draw conclusions on risks the action may pose to the continued existence of these species and the value of designated critical habitat for the conservation of ESA-listed species.

3 DESCRIPTION OF THE PROPOSED ACTION

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies. The proposed action for this consultation is the Permits Division's issuance of a scientific research permit pursuant to the ESA and MMPA to PIFSC, and PIFSC subsequent research activities. The research permit would allow an exception to the moratoria and prohibition on takes established under the ESA and MMPA in order to allow PIFSC to conduct scientific research on ESA-listed and non-listed cetaceans. The purpose of the research is to determine the abundance, stock structure, distribution, movement patterns, and

ecological relationships of cetaceans in the Pacific. This information would be used to develop stock assessment reports, and help protect, manage, and recover cetaceans.

The permit would authorize PIFSC to take ESA-listed blue, false killer (Main Hawaiian Islands Insular DPS), fin, humpback (Western North Pacific DPS), North Pacific right, sei, and sperm whales, as well as several non-listed cetaceans. Table 1 below displays the annual takes of ESA-listed species that would be authorized under Permit No. 20311. For research permits, the Permits Division counts one take per cetacean per day including all approaches[1] and procedure attempts, regardless of whether a behavioral response to the permitted activity is observed.

[1] An "approach" is defined as a continuous sequence of maneuvers involving a vessel, including drifting, directed toward a cetacean or group of cetaceans closer than 100 yards for baleen and sperm whales and 50 yards for all other cetaceans.

Table 1: Proposed annual takes of Endangered Species Act listed species that would be authorized under Permit No. 20311.

Species; Stock	Life Stage	Authorized Takes	No	Take Action	Observe/ Collect Method	Procedures	Details
Whale, blue; Range-wide	All	250	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial	Aerial survey - manned or unmanned
	All	250	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
	Adult/ Juvenile	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
	Calf	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves six months or older
	Adult/ Juvenile	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves six months or older
	Adult/ Juvenile	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to seven animals may have one dart/barb tag and one suction cup tag at the same time; other animals receive one dart/barb tag
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves six months or older
	All	150	unlimited	Import/ Export/ Receive only	Survey, vessel	Import/export/receive, parts	Primarily import into U.S. from sea; Import/export/receive unlimited samples from up to 150 individual animals.
Whale, false killer; Main Hawaiian Islands insular DPS	All	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial	Aerial surveys: manned or UAS
	All	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
	Adult/ Juvenile	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy
	Calf	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy; calves one year or older
	Adult/ Juvenile	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves one year or older

Species; Stock	Life Stage	Authorized Takes	No	Take Action	Observe/ Collect Method	Procedures	Details
	Adult/ Juvenile	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to five animals may have one dart/barb tag and one suction cup tag at the same time; other animals receive one dart/barb tag
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves one year or older
Whale, fin; Range-wide	All	250	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial	Aerial surveys: manned or UAS
	All	250	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
	Adult/ Juvenile	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy
	Calf	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy; calves six months or older
	Adult/ Juvenile	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves six months or older
	Adult/ Juvenile	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to five animals may have one dart/barb tag and one suction cup tag at the same time; other animals receive one dart/barb tag
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves six months or older
	All	150	unlimited	Import/ Export/ Receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
Whale, humpback; Western North Pacific DPS	All	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial	Aerial surveys: manned or UAS
	All	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Underwater photo/videography	Level B activities
	Adult/ Juvenile	100	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy
	Calf	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy; calves of any age (excluding neonates). See text for justification.

Species; Stock	Life Stage	Authorized Takes	No	Take Action	Observe/ Collect Method	Procedures	Details
	Adult/ Juvenile	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves six months or older
	Adult/ Juvenile	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to three animals may have one dart/barb tag and one suction cup tag at the same time; other animals receive one dart/barb tag
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves six months or older
	All	250	unlimited	Import/ Export/ Receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
Whale, right, North Pacific; Range-wide	All	40	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial	Aerial surveys: manned or UAS
	All	50	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
	Adult/ Juvenile	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy; calves six months or older
	Adult/ Juvenile	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves six months or older
	Adult/ Juvenile	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves six months or older
	All	30	unlimited	Import/ Export/ Receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
Whale, sei; Range-wide	All	250	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial	Aerial surveys: manned or UAS
	All	250	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities

Species; Stock	Life Stage	Authorized Takes	No	Take Action	Observe/ Collect Method	Procedures	Details
	Adult/ Juvenile	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy
	Calf	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
	Adult/ Juvenile	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves six months or older
	Adult/ Juvenile	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to three animals may have one dart/barb tag and one suction cup tag at the same time; other animals receive one dart/barb tag
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves six months or older
	All	150	unlimited	Import/ Export/ Receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
Whale, sperm; Range-wide	All	1000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial	Aerial surveys: manned or UAS
	All	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
	Adult/ Juvenile	250	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy
	Calf	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy; calves six months or older
	Adult/ Juvenile	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup; Observations, behavioral; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves six months or older
	Adult/ Juvenile	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to seven animals may have one dart/barb tag and one suction cup tag at the same time; other animals receive one dart/barb tag
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 6 months or older

Species; Stock	Life Stage	Authorized Takes	No	Take Action	Observe/ Collect Method	Procedures	Details
	All	250	unlimited	Import/ Export/ Receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
Whale, unidentified rorqual (may be of any above ESA-listed species or non-ESA-listed species authorized in the permit)	All	100	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial	Aerial surveys: manned or UAS
	All	150	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
	Adult/ Juvenile	45	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy
	Calf	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal; Sample, skin and blubber biopsy	Biopsy; calves six months or older
	All	50	unlimited	Import/ Export/ Receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea

The proposed research would encompass a variety of activities directed at ESA-listed species including aerial surveys (manned and unmanned), vessel surveys, close approaches, and documentation (photography, videography, and passive acoustic recording), biological sampling (fecal, sloughed skin, and biopsy sampling), and tagging. These activities would be directed at ESA-listed and non-ESA-listed cetaceans and are described in more detail below. In addition, researchers would be authorized to import and export marine mammal parts, samples, and specimens, but these activities would have no effects on ESA-listed species outside of the sample collection. As such, the act of exporting and importing is not discussed further in this opinion.

3.1 Aerial Surveys

Manned aerial surveys have long been used by researchers to collect important information on the occurrence, abundance, and habitat use of cetaceans. With recent advances in unmanned aircraft systems (UAS), researchers are now also conducting unmanned aerial surveys to provide similar information, as well as collect additional data not possible with manned aerial surveys. Below we described the proposed manned and unmanned aerial surveys. More detail on both activities can be found in the application (NMFS 2017b).

3.1.1 Manned Aerial Surveys

The Permits Division proposes to authorize PIFSC to take all ESA-listed cetaceans in Table 1 (any age and sex class) by means of harassment during manned aerial surveys. The purpose of manned aerial surveys is to determine the distribution and abundance of cetacean stocks in the action area from coastlines to 200 nautical miles offshore. For manned aerial surveys, PIFSC proposes to use conventional line-transect sampling where planes would be flown along pre-determined routes. Small aircraft, preferably twin-engine, high wing aircraft would be flown at altitudes of approximately 700 feet and airspeeds of 165 to 175 kilometers per hour, while researchers search for cetaceans. Once an animal or group of animals is spotted, the aircraft would circle high (500 to 1000 feet) overhead to confirm species identification and to estimate group size. If an animal or group of animals exhibits a behavioral response to the plane such as diving rapidly, the plane would move on to a different group of animals. The maximum amount of time the plane would spend circling over a single animal or group of animals is one hour. While most manned aerial surveys would follow this line-transect method, manned aerial surveys may also be opportunistically conducted following an event of interest, such as a mass-stranding, oil spill, or other potential threat to cetaceans in a localized region. For these opportunistic surveys, operational conditions (flight altitude, circling behavior, etc.) would be the same as described above.

3.1.2 Unmanned Aerial Surveys

The Permits Division also proposes to authorize PIFSC to take all ESA-listed cetaceans in Table 1 (any age and sex class) by means of harassment during unmanned aerial surveys. The primary goal for these activities is to collect photographic data to confirm species identification, assess age class and body condition, determine group size, and identify social structure. Given the

rapidly evolving field of UAS, the exact models and flight parameters that would be used during unmanned aerial surveys may change over the course of the permit. As such, here we describe the methods that are currently proposed, and recognize that variations of these methods would be authorized under Permit No. 20311, as long as they are expected to cause similar or lower levels of harassment and disturbance to cetaceans.

The UAS that would be used during unmanned aerial surveys would either be fixed wing, long endurance platforms (such as the AeroVironment™ Puma) or a rotary, shorter endurance platforms (such as the Aerial Imaginc Solutions LLC APH-22™ hexacopter, a vertical take-off and landing aircraft) equipped with a camera system. The UASs would be controlled by a licensed pilot, with training from NOAA's Office of Marine and Aviation Operations. The UASs would be launched from ships, small vessels, or suitable ground-based launch sites. Using line of sight and real-time imagery from the UAS, the pilot would direct the UAS to fly a systematic course at constant speed to search an area for nearby cetaceans, or direct the UAS to fly directly toward previously-sighted cetaceans in the area. Once a cetacean is spotted, the UAS would circle or hover directly over animals to collect imagery. The UAS would always remain in the line of sight of the pilot. Rotary UAS flights would generally be conducted at altitudes between 75 and 300 feet and an approximate maximum speed of 15 meters per second in order to minimize harassing and disturbing animals. Since fixed-wing UAS produce more noise, and thus have a greater likelihood of harassing and disturbing animals, they would generally be flown at higher altitudes, between 200 and 1000 feet. The maximum amount of time either type of UAS would spend circling or hovering over an animal or group of animals is one hour. However, a typical rotary UAS battery only lasts up to 20 minutes, so these flights would typically be shorter. If animals display avoidance behavior in response to the presence of the UAS, researchers would obtain the necessary imagery as quickly as possible and then move the UAS away from the animal or group of animals to minimize disturbance.

3.2 Vessel Surveys, Close Approaches, and Documentation

Vessel surveys are the primary means by which cetacean researchers collect data as they provide a platform to collect a wealth of information on cetacean biology. Here we describe the proposed vessel surveys, close approaches, and documentation (i.e., data collection) during these activities more generally, and then in each section below, detail the individual research activities that would occur during vessel surveys.

The Permits Division proposes to authorize PIFSC to take all age and sex classes of ESA-listed cetaceans in Table 1 by means of harassment as the result of close approaches and documentation during vessel surveys. The proposed vessels surveys would use a line-transect method, and general follow the protocol described below. However, variations of this protocol would be used to meet specific research objectives, but such variations would not change the nature of effects to ESA-listed species.

Typically, a large research vessel such as the 224 foot NOAA R/V Oscar Elton Sette, or similar, would traverse predetermined track lines within the action area at a constant speed (usually 10

knots), while observers search for cetaceans with binoculars. While researchers search for cetaceans, a variety of environmental data would be collected (e.g., sea state, visibility, glare, etc.). In addition, a hydrophone array would be towed to passively detect and record vocalizations of nearby cetaceans. Once a cetacean or group of cetaceans is spotted or detected acoustically, the vessel would either remain on the track line to record data, or depending on the species and data collection priorities, turn off the track line and approach to confirm species identification and estimate group size. If the vessel were to approach, the approach would be conducted either from behind or alongside animals at the minimum speed (less than 10 knots) needed to close the distance between the ship and the group of animals to within 300 meters. During this approach, small (five to 10 meter) rigid inflatable or fiberglass researcher vessels would sometimes be launched in order to document the encounter or conduct biological sampling or tagging, as further described below. In addition, some research operations may only involve these smaller research vessels being launched from shore. Smaller research vessels would utilize the same approach methodology as larger research vessels described above in order to minimize disturbance and harassment to cetaceans. Depending on the research objectives, the vessel(s) may fairly quickly end the encounter and resume course along the track line (or search for other animals in the event a small vessel is being used), or continue the encounter for further documentation, biological sampling, and/or tagging as further described below.

Throughout vessel surveys and close approaches, researchers would be authorized to document their encounters with cetaceans using photography, videography, and passive acoustic recordings. Photography and videography could occur from the surface or underwater. For surface photography and videography, researchers would use the same approach methods described above to come within 10 to 20 meters of large cetaceans (baleen and sperm whales) and five to 10 meters of small cetaceans (false killer whales, Main Hawaiian Islands Insular DPS) in order to capture high quality photographs or video. Underwater photography and videography would be captured using either pole-mounted cameras extended over the side of research vessels during close approaches, or cameras operated by free divers. When divers are used, no more than two divers would enter the water and slowly approach the cetacean(s), with one diver documenting the encounter, and the other monitoring animal behavior and the environment for signs of disturbance and/or safety concerns. The secondary diver would also be responsible for communications back to the support vessel, and at all times only one diver would be fully submerged. Passive acoustic arrays consisting of two to five hydrophones could be towed at any time during vessel surveys, typically at distances 300 meters behind the vessel. All of these documentation methods are commonly used by cetacean researchers to collect data on animal behavioral, vocalizations, and physical characteristics and to identify and track individuals. Depending on the species and research objectives, documentation may be conducted from large or small vessels, or both.

During both small vessel and large vessel encounters, the total time spent in the vicinity of target animals, as well as the number of attempts made to collect photographs, would vary by species and group size but limited in duration in order to minimize harassment and disturbance. Based on

typical encounters with cetaceans during similar research activities, we expect researchers to remain with a cetacean or group of cetaceans anywhere from 45 minutes to three hours (NMFS 2017a).

3.3 Biological Sampling

Biological samples from free ranging cetaceans allow researchers to address numerous important questions regarding animals' ecology, physiology, health, and relatedness and population structure. The Permits Division proposes to authorize PIFSC to collect a variety of different biological samples including feces, sloughed skin, and skin and blubber through biopsy sampling. Methods for obtaining each of these types of samples are described below.

3.3.1 Fecal and Sloughed Skin Sampling

Fecal and sloughed skin sampling are well-established noninvasive sample collection methods that can be used to assess reproductive hormones, stress, parasites, red tide effects, diet composition, energetics, nutrition, and genetics (Amos et al. 1992; Hunt et al. 2013). The collection of sloughed skin and feces does not usually require approaching animals directly. However, fecal and sloughed skin sampling could take place in the vicinity of whales, and due to this potential for close proximity, the Permits Division proposes to authorize the applicant to collect fecal and sloughed skin samples in the vicinity of all age and sex classes of ESA-listed cetaceans in Table 1 during vessel surveys. When feces or sloughed skin is observed in the water, researchers would approach the sample (not the whale) and collect it with a hand held net. As no particular whale is expected to be "taken" during fecal and sloughed skin sampling, there is no limit on the number of samples that can be taken, but the researcher would only be authorized to take the species and number of ESA-listed cetaceans in Table 1 as a result of the close approaches that may occur during fecal and sloughed skin sampling.

3.3.2 Biopsy Sampling

Biopsy sampling is a widely used method for obtaining skin and blubber tissue from cetaceans for use in studies on genetics, contaminants, disease, foraging ecology, reproduction, and other physiological and biological processes. At least 42 species of cetacean have been biopsy sampled (33 odontocetes and nine mysticetes) since the method was initially developed in 1973 (Noren and Mocklin 2012).

The Permits Division proposes to authorize PIFSC to biopsy sample ESA-listed cetaceans as identified in Table 1 during vessel surveys. Biopsy sampling would be authorized for both sexes. For false killer whales (Main Hawaiian Islands Insular DPS), calves less than a year old would not be biopsy sampled. For the remaining ESA-listed cetaceans in Table 1 except humpback whales (Western North Pacific DPS), calves less than six months would not be biopsy sampled. For humpback whales (Western North Pacific DPS), calves younger than six months old may be biopsy sampled, but biopsy sampling of neonates, as distinguished be fetal folds, would not be authorized. The proposed biopsying of this younger age class for humpback whales (Western North Pacific DPS) is necessary as very

little is known about this DPS of humpbacks around the Mariana Islands; in fact, PIFSC only recently discovered that humpbacks were breeding in the Mariana Islands as part of their research conducted under their previous Permit No. 15240. Given that researchers infrequently sight humpbacks from this DPS, and that young calves do not regularly lift their tail flukes out of the water for photographs, nor do they yet have distinct dorsal fins that can be matched with confidence between years, biopsy sampling and subsequent genetic analysis is required in order to allow researchers to identify and track this DPS of humpbacks around the Mariana Islands across years.

Researchers would be authorized to attempt to biopsy sample an individual up to three times in a day. While PIFSC intends to biopsy sample individual cetaceans only once in a single year (Table 1), unintentional repeat sampling could occur. However, researchers would attempt to avoid unintentional repeat biopsying by keeping detailed descriptive or photographic records of dorsal fins, flukes or other distinctively marked body parts so that previously biopsied individuals can be identified prior to repeat biopsying.

Biopsy sampling would be authorized from both large vessels and small vessels, using a variety of different methods depending on the vessel platform, species, and behavior (reviewed in Noren and Mocklin 2012). Close vessel approaches for biopsy sampling would be the same as those described above except that vessels may get slightly closer, to within five to 30 meters of the target animal(s) (Palsbøll et al. 1991). Projectile biopsy sampling devices that would be used include crossbows, adjustable-pressure modified air-guns, and poles. In addition, if small cetaceans are riding the bow of a large research vessel, projectile devices with tethered biopsy darts would be used. For this method, one end of a length of line would be tied to the biopsy dart and the other to handrail on the ship. With just enough line to reach the water, the dart would be projected at the target animal and then easily retrieved by an onboard researcher using the tethered line. Tethered biopsy sampling of large cetaceans may also occur if conditions make retrieving biopsy darts by small vessel unfeasible. For this method, a spool of line with one end attached to the biopsy dart and the other attached to the projectile device would be used. In both cases of tethered biopsy sampling, the lines that would be used would be light, easily breakable by cetaceans, and would not be expected to cause any entanglement or injury (NMFS 2017b). Nonetheless, PIFSC would primarily use non-tethered biopsy sampling methods since tethering alters dart trajectory in windy conditions, decreasing the likelihood of successfully obtaining a biopsy sample. When targeting an individual for biopsy sampling, researchers would be required to take reasonable measures to avoid repeat sampling (e.g., compare photo-identifications) and not be authorized to biopsy sample animals anywhere forward of the pectoral fins. Once the biopsy dart hits the animal, it would recoil, fall into the water, and float for retrieval by boat or the tethered line.

Biopsy dart tips would be made of stainless steel and dimensions would vary by species in order to ensure that dart tips do not penetrate into the animal's muscle layer (i.e., only skin and blubber would be collected). Penetration depth would be controlled by a cushioned stop 25 millimeters in

diameter circling the biopsy head. For small cetaceans such false killer whales (Main Hawaiian Islands Insular DPS), biopsy tips would penetrate to depths of approximately 15 millimeters and collect samples of approximately seven millimeters in diameter. For large cetaceans (baleen and sperm whales), biopsy darts would penetrate to depths of approximately 35 millimeters and also collect samples of approximately seven millimeters in diameter. Prior to field work, biopsy tips would be thoroughly sterilized[2] with ethylene oxide gas or an autoclave. The PIFSC's current protocol for sterilization of biopsy tips consists of first washing biopsy tips with soap and water and towel dried to ensure all grease (for new instruments), tissue, seawater, or other compounds are removed prior to sterilization. Then, instruments are sterilized using ethylene oxide in a commercial gas sterilization unit or within an autoclave. Each instrument is placed in an individual sterilization pouch suitable for gas sterilization or autoclave use, then placed inside the sterilizer unit. An indicator strip within each individual pouch is used to ensure instrument were appropriately sterilized during each process. Instruments are kept in individual sterilized packages until use. Any manipulation of the tags and anchors during and after the sterilization process (until the moment they are deployed) is carried out with surgical gloves. If a biopsy tip is fired but does not successfully anchor to the target animal (i.e., the shot was missed), the biopsy tip will be set aside and not used again until it is re-sterilized. In the future, other equivalent sterilization methods may be used as long as they provide the same sterilization standards.

For remote field or at-sea efforts where sterilization facilities are not available, PIFSC would instead disinfect[3] biopsy tips before they are used again, regardless of if they contact an animal. For disinfection biopsy tips are washed with soap and water and towel dried to ensure all tissue, seawater, or other compounds are removed. Tips are then soaked in a 10 percent sodium hypochlorite bath for 20 minutes or a cetylcide bath for 40 minutes (following the contact time requirements provided by the manufacturer). Tips are then rinsed with isopropyl alcohol and acetone, then air dried. Following disinfection, tips are handled with surgical gloves and placed in individual pouches for field use.

These sterilization and disinfection techniques were recently improved following the death of a killer whale which may have been related to a dart/barb tag. As such, they are more stringent than those techniques described in PIFSC's approved Institutional Animal Care and Use Committee protocol (NMFS 2016d). Nonetheless, PIFSC's has agreed to these improved methods and would be required to use them as a condition of their permit.

3.4 Tagging

Recent advances in tagging technologies have provided unprecedented detail on cetacean biology, allowing researchers to better understand their physiology, foraging, ranging, diving, and sociality, and have improved efforts to protect and conserve these species (Nowacek et al.

[2] Sterilization = destroys or eliminates all forms of microbial life and is carried out by physical or chemical methods (Rutala and Weber 2008)

[3] Disinfection = eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects usually by liquid chemicals (Rutala and Weber 2008)

2016). The Permits Division proposes to authorize PIFSC to tag ESA-listed cetaceans as specified in Table 1 with suction-cup and/or dart/barb tags. PIFSC would be authorize to tag both males and females (including females with dependent females). For false killer whales (Main Hawaiian Islands Insular DPS), calves greater than one year old would be tagged, and for the remaining ESA-listed cetaceans in Table 1, calves greater than six months old would be tagged. Regardless of tag type, researchers would not attempt to tag an individual that appears to be compromised (e.g., appears to be in poor health, exhibiting unusual behavior). Researchers would only be authorized to tag any given individual on one day per year. However, within any given day, researchers could attempt to tag an individual with up to two tags (one suction-cup tag and one dart/barb tag) as long as the individual exhibits no strong behavioral reaction to the first tag deployment, and thus are amenable to a second tagging attempt. Below we describe the specifications of each proposed tag type according to the attachment mechanism, followed by a description of the methods used to attach tags and monitor whales following tag attachment, which are similar across tag types.

3.4.1 Tag Types

Tagging technologies for cetaceans are rapidly advancing (Nowacek et al. 2016). As such, the suite of tags that PIFSC would use over the five-year duration of the permit are not known at this time. However, below we describe the currently available types of tags that could be used under Permit No. 20311. Any new tags or modifications to existing tags would only be authorized under Permit No. 20311 if they have the same or lesser impacts to animals (i.e., smaller, lighter, reduced risk of injury, etc.). Currently, PIFSC proposes to use two different types of tags, as distinguished by their attachment mechanism. These include partially penetrating tags (Type II, referred to as dart/barb in Table 1), and non-penetrating tags (Type III, referred to as suction-cup in Table 1) (ONR 2009). The exact tag used would vary by species and research objective. However, PIFSC would always attempt to use the smallest, lightest tag possible that still meets the primary research objectives.

Type II

Type II tags consist of tags in which a portion of the tag such as metal darts, barbs, or pins penetrate the animal's tissue for attachment, while the electronic package of the tag remains outside of the animal's body. These tags are designed for medium durations, lasting from a week to several months, and for use on both small and large cetaceans. Type II tags can be archival meaning researchers must recover the tag to download data, or non-recoverable with all data being transmitted via satellite. A variety of Type II tags currently exist including Low Impact Minimally Percutaneous External-electronics Transmitter (LIMPET) tags, Whale Lander tags, Dermally Attached Short-term (DASH) tags, suction-cup style tags modified to include darts to increase duration, and a variety of modified versions of these tags (Figure 1) (NMFS 2017a). The penetrating portions of Type II tags are typically made of surgical grade stainless steel or high-grade titanium, which are attached to the electronic portion of the tag encased in an epoxy and urethane housing. Type II tags are designed to remain solely within the blubber layer when

deployed on large cetaceans such as baleen and sperm whales, and not fully penetrate the dorsal fin when deployed on medium sized cetaceans such as false killer whales (Main Hawaiian Islands Insular DPS).

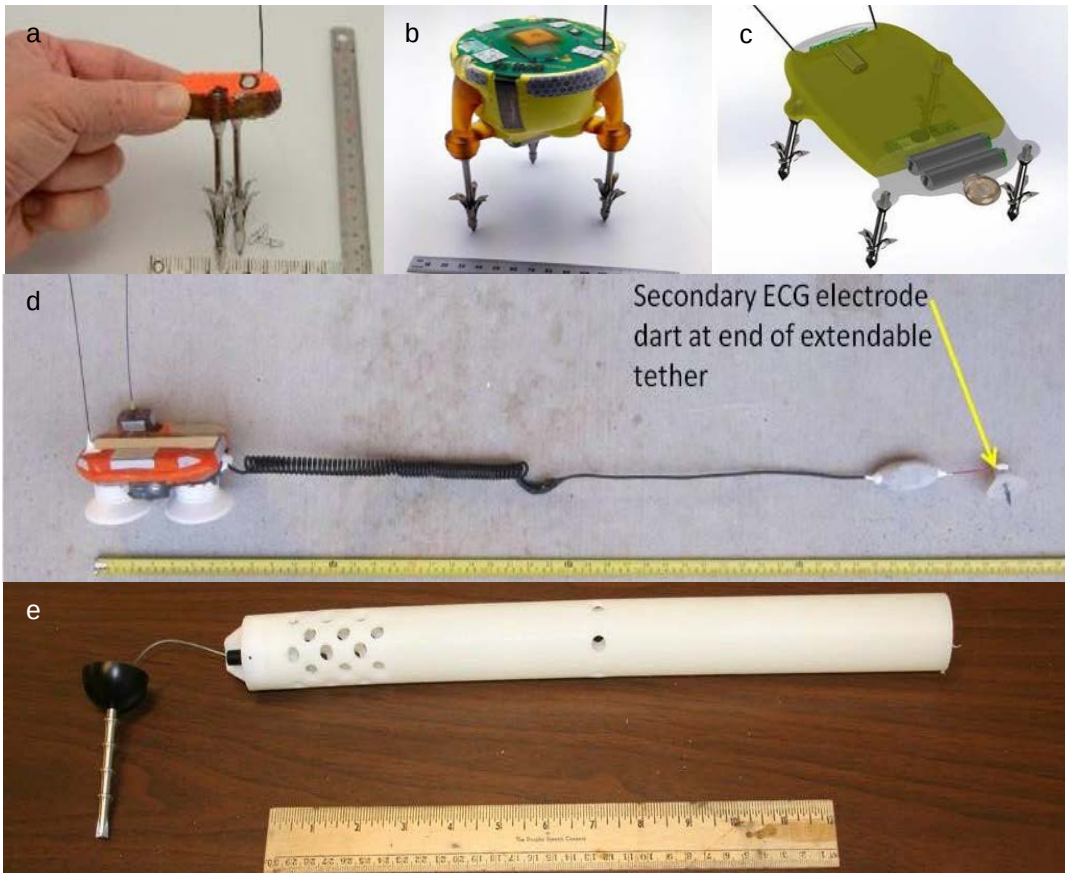

Figure 1: Example Type II tags. a) Low Impact Minimally Percutaneous External-electronics Transmitter tag, b) Whale Lander tag, c) alternate design of a Multi-sensor, Multi-dart tag with four darts, d) Multi-sensor behavioral and physiological recording tag with primary electrodes in darts of main tag body (under suction cups) and secondary electrode in dart at end of tether, e) Dermally Attached Short-term tag (NMFS 2017a).

Given the variety of currently available Type II tags and the constant advances in tag technology, the exact size, weight, and depth and number of penetration points of Type II tags that would be used under Permit No. 20331 is not known. In their application, PIFSC proposes to use non-recoverable, location-only LIMPET Type II tags with medical-grade titanium darts, but they would be authorized to use any currently available or future Type II tags as long as they result (or are expect to result) in the same or less impacts to cetaceans. Thus, all current models represent examples of tag specifications that would likely be used. Current location-only LIMPET tags (SPOT6, Figure 1a) measure 55 millimeters by 48 millimeters by 21 millimeters and weigh 49 grams without darts (Andrews et al. 2015). They are typically attached with two or three darts measuring 65 to 100 millimeters in length, with retention barbs between five and 30 millimeters long, making for a maximum tag weight of 90 grams. Current Whale Lander tags (Figure 1b), which are archival, utilize the same dart attachment system as LIMPET tags and

measure 8.9 centimeters in diameter and 6.5 centimeters tall (NMFS 2016c). An alternate design Multi-sensor, Multi-dart tag currently under development (Figure 1c) would be similar in size to LIMPET and Whale Lander tags, and attach with four LIMPET style darts. Modified Type I suction-cup style tags (detailed further below) also exist in which LIMPET style darts (e.g., Figure 1d) are added to suction-cups to increase attachment, and or add additional physiological sensors. DASH tags (Figure 1e) differ from most other Type II tags in that they use a short needle for anchoring, which is then attached to a free-floating tag (approximately 35 millimeter in diameter and 350 grams) via a corrosive tether (Baumgartner et al. 2015). Despite having two components when attached, DASH tags are designed to be a contiguous projectile when fired at the whale, and only after attachment would the tag housing separate from the needle and float alongside the whale. Current DASH models use needles less than 10 centimeters in length and 6.4 millimeters in diameter, with raised rings or pins to prevent early detachment, and a stopper to control penetration depth.

Type II tags would contain a variety of sensors depending on the tag model and research objective. These include but are not limited to satellite transmitters, time-depth-recorders, acoustic time-depth-recorders, video cameras, accelerometers, other 3-dimensional movement sensors, and physiological sensors such as a thermistor or electrocardiogram sensors that may be contained within darts attached to a tether. Given that archival tags must be located after detaching from the whale, these tags would always have a Global Positioning System unit and or a very high frequency radio transmitter to aid in tag recovery. While some archival Type II tags may contain remote release functions or corrosive links that can be used to detach the electronic package of the tag, the penetrating portion of the tag would always detach via natural outward foreign body migration. Type II tags typically remain within whales for only a few days or up to several months (Andrews et al. 2015; Baumgartner et al. 2015; Citta et al. 2012; NMFS 2016c; Szesciorka et al. 2016).

Type III

Type III tags consist of tags that use a non-invasive, non-penetrating attachment systems. These tags are designed for short durations, only lasting hours up to several days, and can be used on all cetacean species. Most Type III tags are archival and attach to cetaceans using either rigid or non-rigid rubber or silicon suction-cups. A variety of current Type III tags exist including National Geographic Crittercams, Digital Acoustic Recording tags (e.g., Figure 2), Acousonde tags, Customized Animal Tracking Solutions tags, among others.

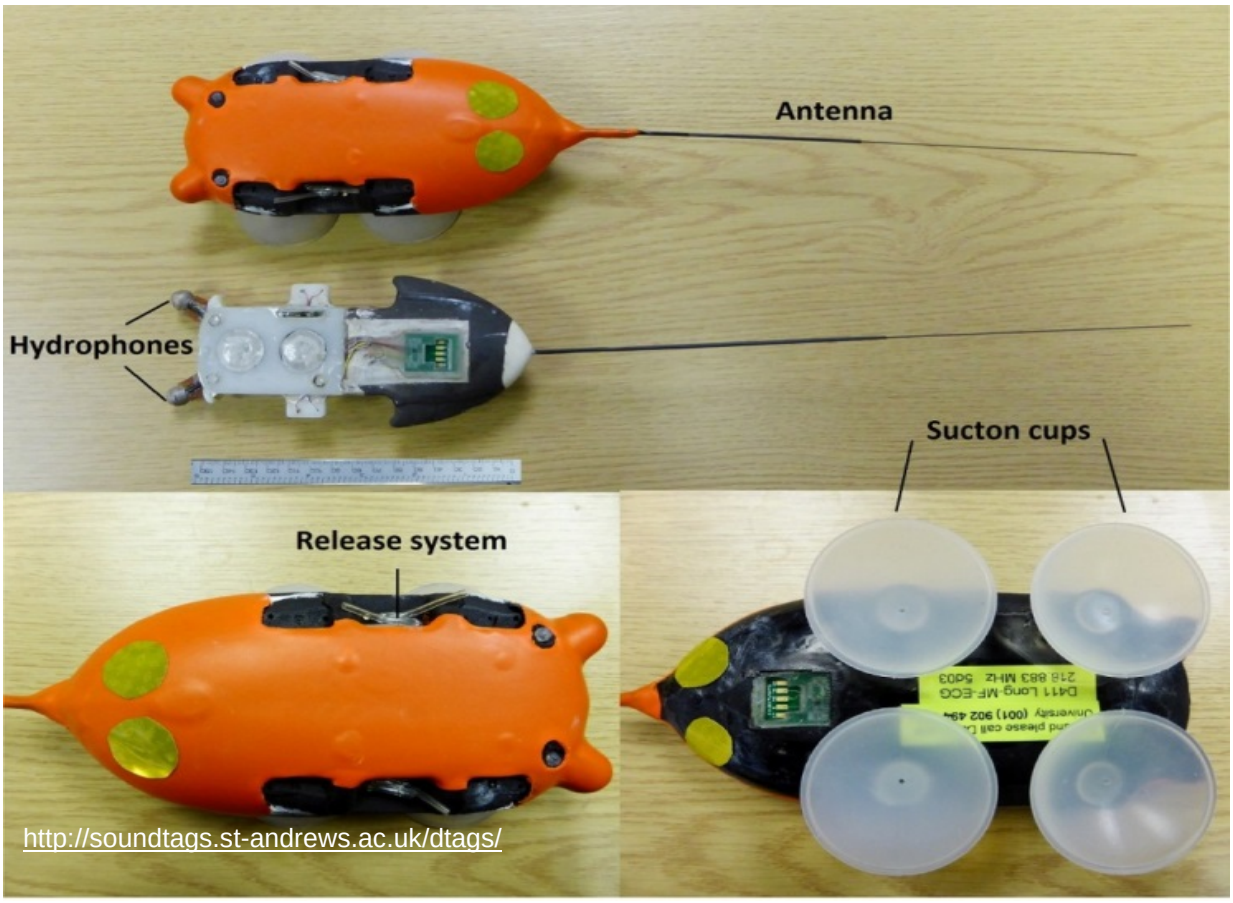

Figure 2: Example Digital Acoustic Recording Tag, Version 3.

Type III tags are typically small measuring approximately 30 centimeters by 12 centimeters by 3 centimeters and weighing 450 grams or less, but heavier video camera tags such as Crittercam tags measuring weighing approximately 800 grams exist. Type III tags usually consist of an electronic package housed in a mixture of glass microspheres and polyethylene resin encased within or attached to a non-compressible foam or plastic floatation system to aid in recovery.

Depending on the specific tag model and target species, one or several suction-cups may be used ranging in size from three to 30 centimeters in diameter, which may be lubricated with silicon grease or other non-reactive substances to improve the seal between the cup and skin. As with Type II tags, Type III tags would contain a variety of sensors including time-depth-recorders, acoustic recorders, video cameras, temperature sensors, accelerometers, pressure sensors, accelerometers, light sensors, gyroscopes, among others. Given that Type III tags are almost always archival, they typically have a very high frequency radio transmitter, Global Positioning System unit, and/or strobe light to aide in tag recovery. Suction-cup tags mostly rely on passive release that occurs when the suction-cup seal breaks contact with the skin, but some tags models are equipped with release mechanism. Regardless, suction-cup tags only remain attached to animals for minutes up to several days before falling off (Szesciorka et al. 2016).

3.4.2 Tag Deployment

Prior to tag deployment, all dart/barb tags would be sterilized in the same manner previously described for biopsy tips in Section 3.3.2. However, unlike with biopsy tips, PIFSC would not field-disinfect tags for re-use if they become contaminated. Instead, only lab sterilized tags would be used, and if unavailable (e.g., only contaminated tags from missed attempts are available) tagging efforts would cease.

A variety of deployment methods would be used to attach tags to cetaceans. Tag deployments would take place either when animals approach small research vessels on their own or during directed small vessel approaches as described in Section 3.2, but in some cases with closer proximity to whales (one to 30 meters). The exact method would depend on the tag type, the target species, and the vessel from which the tag is being deployed. For Type II tags, crossbows, poles, and pneumatic rifles would be used for deployment. With all these methods, the tag would be placed in a tag holder at the tip of an arrow/bolt, which slides into the flight groove of the crossbow or the barrel of the rifles prior to firing (e.g. Figure 3). On contact with an animal, the arrow/bolt would fall away and be retrieved, leaving only the tag attached to the animal. Type III tags, and on occasion Type II tags, would be deployed with hand-held poles ranging in length from four to seven meters. Researchers would extend a pole over the side of small research vessels during close approaches and manually place the tag on the cetacean. The location tags would be placed on cetaceans would vary according to species and tag type. In general, for large whales (baleen and sperm whales) tags would be placed high on the dorsal surface of the animal, and for smaller cetaceans (false killer whales, Main Hawaiian Islands Insular DPS), tags would be placed either on the dorsal surface or dorsal fin.

Figure 3: Example of crossbow equipped with Low Impact Minimally Percutaneous External-electronics Transmitter tag (left), and example of suction-cup tag deployment with hand-held pole (right).

3.4.3 Tag Monitoring

When possible, researchers would attempt to monitor tagged whales through observation and photographs and/or video in order to document response to tagging, tag location and orientation, examine modes of tag failure, and monitor wound healing. Given the short duration and archival nature of Type III tags, researchers may attempt to track whales after Type III tag deployments in order to further monitor behavior and retrieve the tag once released. Such monitoring would be conducted from the research vessels at distances of several hundred meters (minimum distance of 100 meters). Once Type III tags are retrieved, researchers would attempt to collect skin samples from the inner surface of the suction cups. For Type II tags, which are likely to stay attached for multiple days, up several months, researchers would not remain with whales but instead, attempt to re-sight individuals when possible to monitor tag wound healing.

4 INTERRELATED AND INTERDEPENDENT ACTIONS

Interrelated actions are those that are part of a larger action and depend on that action for their justification. *Interdependent* actions are those that do not have independent utility apart from the action under consideration. For this consultation, we consider all vessel transit associated with research activities as interdependent. Thus, we evaluate the effects this vessel transit on ESA-listed species and so include all waters traversed during such transits as part of the action area.

5 ACTION AREA

Action area means all areas affected directly, or indirectly, by the Federal action, and not just the immediate area involved in the action (50 C.F.R. 402.02). The action area for Permit No. 20311 can be seen below in Figure 4. This includes United States waters in the Pacific Islands Region, the Hawaii archipelago, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, Kingman Reef, Palmyra Atoll, Johnston Atoll, Wake Atoll, Howland Island, Baker Island, Jarvis Island and all internatinional waters between these U.S. terretories. The action area

also includes waters in the territorial seas of Russia, Japan, Philippines, Palau, Indonesia, Papua New Guinea, Federated States of Micronesia, Marshall Islands, Tokelau, Wallis and Futuna, Tavalu, Tonga, Fiji, Nauru, Niue, Samoa, Cook Islands, Salomon Islands, and Kiribati, as collaborative research projects involving these countries may span international waters and the terrotirial seas of these countries. Research would occur anytime throughout the year.

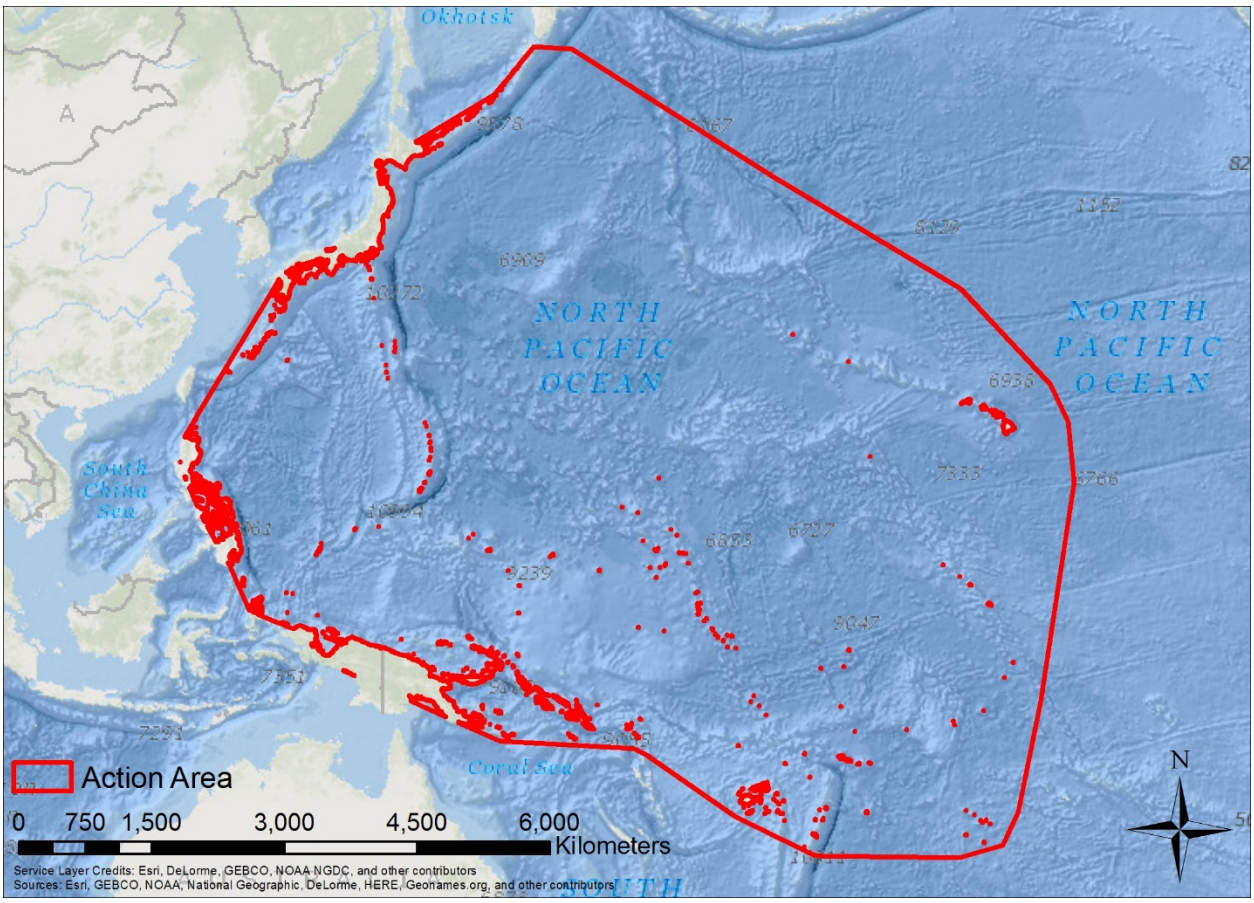

Figure 4: Action Area for Permit No. 20311 in the Pacific Ocean.

6 STATUS OF ENDANGERED SPECIES ACT PROTECTED RESOURCES

This section identifies the ESA-listed species that potentially occur within the action area (Figure 4) that may be affected by the issuance of Permit No. 20311. It then summarizes the biology and ecology of those species that may be adversely affected by the proposed action, and details information on their life histories in the action area if known. The ESA-listed species potentially occurring within the action area are given in Table 2, along with their regulatory status.

Table 2: Threatened and endangered species that may be affected by the Permit and Conservation Division's proposed action of the issuance of research Permit No. 20311.

Species	ESA Status	Critical Habitat	Recovery Plan
Cetaceans			
Blue Whale (*Balaenoptera musculus)*	E – 35 FR 18319	-- --	07/1998
False Killer Whale (*Pseudorca crassidens*) – Main Hawaiian Islands Insular DPS	E – 77 FR 70915	-- --	-- --
Fin Whale (*Balaenoptera physalus)*	E – 35 FR 18319	-- --	75 FR 47538
Humpback Whale (*Megaptera novaeangliae*) – Western North Pacific DPS	E – 81 FR 62259	-- --	11/1991
North Pacific Right Whale (*Eubalaena japonica*)	E – 73 FR 12024	59 FR 28805 and 73 FR 19000	78 FR 34347
Sei Whale (*Balaenoptera borealis*)	E – 35 FR 18319	-- --	12/2011
Sperm Whale (*Physeter macrocephalus*)	E – 35 FR 18319	-- --	75 FR 81584
Pinnipeds			
Hawaiian Monk Seal (*Neomonachus schauinslandi*)	E – 41 FR 51611	80 FR 50925, 53 FR 18988, and 51 FR 16047	72 FR 46966
Marine Reptiles			
Green Turtle, (*Chelonia mydas*) – Central North Pacific DPS	T – 81 FR 20057	-- --	63 FR 28359
Green Turtle, (*Chelonia mydas*) – Central West Pacific DPS	E – 81 FR 20057	-- --	63 FR 28359
Green Turtle, (*Chelonia mydas*) – East Indian-West Pacific DPS	T – 81 FR 20057	-- --	-- --
Green Turtle, (*Chelonia mydas*) – Central South Pacific DPS	E – 81 FR 20057	-- --	63 FR 28359
Hawksbill Turtle (*Eretmochelys imbricata)*	E – 35 FR 8491	63 FR 46693	63 FR 28359 and 57 FR 38818
Leatherback Turtle (*Dermochelys coriacea*)	E – 35 FR 8491	44 FR 17710 and 77 FR 4170	63 FR 28359 and 10/1991
Loggerhead Turtle (*Caretta caretta*) – North Pacific Ocean DPS	E – 76 FR 58868	-- --	63 FR 28359

Species	ESA Status	Critical Habitat	Recovery Plan
Loggerhead Turtle (*Caretta caretta*) – South Pacific Ocean DPS	E – 76 FR 58868	-- --	-- --
Olive Ridley Turtle (*Lepidochelys olivacea*) All Other Areas	T – 43 FR 32800	-- --	-- --
Olive Ridley Turtle (*Lepidochelys olivacea*) Mexico's Pacific Coast Breeding Colonies	E – 43 FR 32800	-- --	63 FR 28359

6.1 Species Not Likely to be Adversely Affected

NMFS uses two criteria to identify the ESA-listed or critical habitat that are not likely to be adversely affected by the proposed action, as well as the effects of activities that are interrelated to or interdependent with the Federal agency's proposed action. The first criterion is exposure, or some reasonable expectation of a co-occurrence, between one or more potential stressors associated with the proposed activities and ESA-listed species or designated critical habitat. If we conclude that an ESA-listed species or designated critical habitat is not likely to be exposed to the proposed activities, we must also conclude that the species or critical habitat is not likely to be adversely affected by those activities.

The second criterion is the probability of a response given exposure. ESA-listed species or designated critical habitat that is exposed to a potential stressor but is likely to be unaffected by the exposure is also not likely to be adversely affected by the proposed action. We applied these criteria to the species ESA-listed in Table 2 and we summarize our results below.

An action warrants a "may affect, not likely to be adversely affected" finding when its effects are wholly *beneficial*, *insignificant* or *discountable*. *Beneficial* effects have an immediate positive effect without any adverse effects to the species or habitat. Beneficial effects are usually discussed when the project has a clear link to the ESA-listed species or its specific habitat needs and consultation is required because the species may be affected.

Insignificant effects relate to the size or severity of the impact and include those effects that are undetectable, not measurable, or so minor that they cannot be meaningfully evaluated. Insignificant is the appropriate effect conclusion when plausible effects are going to happen, but will not rise to the level of constituting an adverse effect. That means the ESA-listed species may be expected to be affected, but not harmed or harassed.

Discountable effects are those that are extremely unlikely to occur. For an effect to be discountable, there must be a plausible adverse effect (i.e., a credible effect that could result from the action and that would be an adverse effect if it did impact a listed species), but it is very unlikely to occur.

6.1.1 Hawaiian Monk Seals

The proposed action spatially overlaps with and may affect Hawaiian monk seals. The Permits Division has determined that the issuance of Permit No. 20311 is not likely to adversely affect Hawaiian monk seals. Interactions with Hawaiian monk seals could potentially involve disturbance and ship strikes. However, the possibility of these interactions is considered remote because the proposed research activities are directed at cetaceans.

Both aerial and vessel survey could disturb Hawaiian monk seals. However, researchers would be on constant lookout for cetaceans and thus if a Hawaiian monk seal is spotted, researchers would be able to avoid closely approaching it. Furthermore, the permit would require researchers to leave the area if approached by Hawaiian monk seals, and divers would not be allowed to enter the water if monk seals are in the area. In addition, researchers would not be authorize to conduct aerial surveys over pinnipeds on land. Considering the above conditions, in most cases, researchers will be able to completely avoid Hawaiian monk seals. Nonetheless, we recognize that short-term encounters with Hawaiian monk seals may occur if researchers do not spot seals before vessels or aircraft are relatively close. Under these circumstances, we expect Hawaiian monk seals would respond similarly to other pinniped species and show no behavioral response or avoidance, which may be associated with a mild stress response (Andersen et al. 2012). Given these responses, and the short-term nature of the possible encounters, we do not anticipate that any disturbance from aerial and vessel surveys would have a measureable impact on Hawaiian monk seal behavior or physiology. As such, we find the effects of disturbance to Hawaiian monk seals from aerial and vessel surveys to be insignificant.

The likelihood of ships strikes of Hawaiian monk seals is also expected to be extremely low, given that the researchers will adhere to slow transit speeds designed to avoid ship strikes with cetaceans, which have less maneuverability than Hawaiian monk seals. In addition, observers would always be on the lookout for cetaceans to help vessels avoid collisions. Finally, we are not aware of any case of a cetacean research vessel striking a pinniped. Therefore, we find that it is extremely unlikely that a research vessel will strike a Hawaiian monk seals, and thus such effects are discountable.

In summary, we concur with the Permits Division that the issuance of Permit No. 20311 is not likely to adversely affect Hawaiian monk seals, and we will not discuss this species further.

6.1.2 Sea Turtles

The proposed action spatially overlaps with and may affect several ESA-listed sea turtle species and/or DPSs including green turtles (Central North Pacific, Central West Pacific, East Indian-West Pacific, and Central South Pacific DPSs), hawksbill turtles, leatherback turtles, loggerhead turtles (North Pacific and South Pacific DPSs), and olive ridley turtles (Mexico's Pacific Coast Breeding and All other areas). The Permits Division has determined that the issuance of Permit No. 20311 is not likely to adversely affect these ESA-listed sea turtles. Like Hawaiian monk seals above, interactions with sea turtles could potentially involve disturbance and ship strikes,

but the possibility of these interactions is considered remote due to the directed nature of the research activities.

Similar to above, aerial and vessel surveys could disturb sea turtles. However, researchers would constantly be on the lookout for cetaceans and thus be able to spot sea turtles at a distance (approximately 100 to 200 meters, Epperly et al. 2002), well before they would be expected to respond (Hazel et al. 2007). Furthermore, if a sea turtle were spotted, researchers would stop research activities and move to another area or wait until the turtle left the area. Based on these factors, we find that disturbance of sea turtles is extremely unlikely to occur, and thus discountable.

As with Hawaiian monk seals above, ships strikes of sea turtles are also expected to be extremely unlikely given the slow speeds vessels would be traveling at and the numerous observers on lookout for cetaceans. In addition, we are not aware of any case of a cetacean research vessel striking a sea turtle. For these reasons, we find it is extremely unlikely that a research vessel will strike a sea turtle, and thus such effects are discountable.

In summary, we concur with the Permits Division that the issuance of Permit No. 20311 is not likely to adversely affect ESA-listed sea turtles, and we will not discuss these species further.

6.2 Species Likely to be Adversely Affected

This opinion examines the status of each species that would be affected by the proposed action. The status is determined by the level of risk that the ESA-listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. The species status section helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 C.F.R. 402.02. More detailed information on the status and trends of these ESA-listed species, and their biology and ecology can be found in the listing regulations and critical habitat designations published in the Federal Register, status reviews, recovery plans, and on NMFS Web site: http://www.nmfs.noaa.gov/pr/species/esa/listed.htm.

Below we describe the status of the species that are likely to be adversely affected by the proposed action. When available, we also describe that status of the species specifically within the action area.

6.2.1 Blue Whale

The blue whale is a widely distributed baleen whale found in all major oceans (Figure 5).

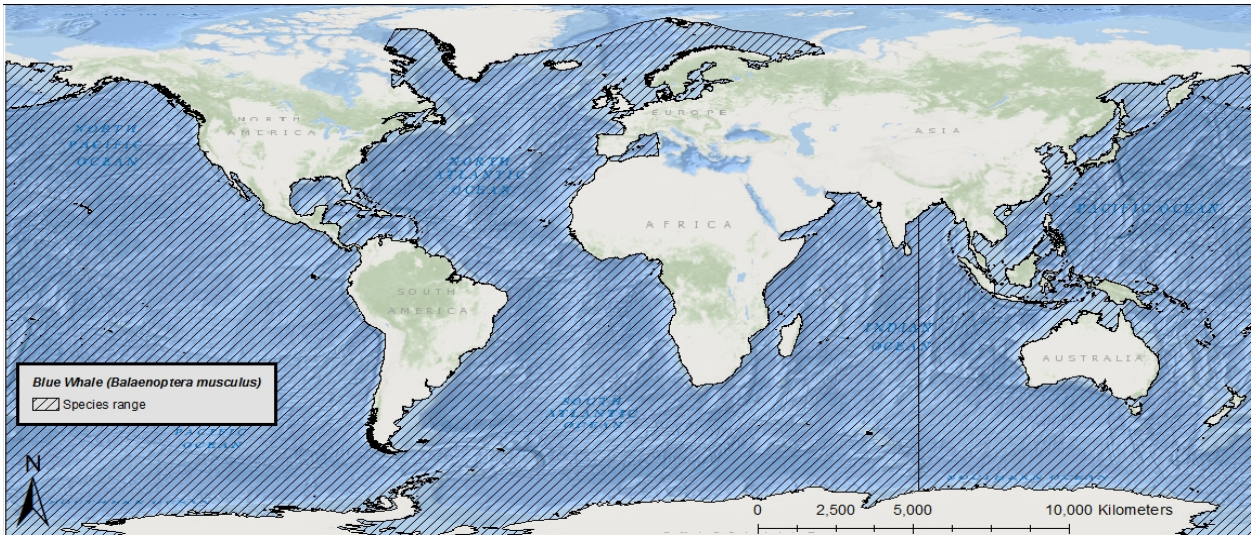

Figure 5: Map identifying the range of the blue whale.

Blue whales are the largest animal on earth and distinguishable from other whales by a long-body and comparatively slender shape, a broad, flat "rostrum" when viewed from above, a proportionally smaller dorsal fin, and a mottled gray coloration that appears light blue when seen through the water (Figure 6). Most experts recognize at least three subspecies of blue whale, *B. m. musculus*, which occurs in the Northern Hemisphere, *B. m. intermedia* or Antarctic blue whales, which occurs in the Southern Ocean, and *B. m. brevicauda*, a pygmy species found in the Indian Ocean and South Pacific. The blue whale was originally listed as endangered on December 2, 1970 (Table 3).

Figure 6: Blue whale. Photo: National Oceanic and Atmospheric Administration

Table 3: Blue whale information bar provides species Latin name, common name and current Federal Register notice of listing status, designated critical habitat, Distinct Population Segment/Evolutionary Significant Unit, recent status review, and recovery plan.

Species	Common Name	Distinct Population Segment	ESA Status	Recent Review Year	Listing	Recovery Plan	Critical Habitat
Balaenoptera musculus	Blue whale	None	Endangered	None	35 FR 18319	1998 Intent to update (77 FR 22760)	None Designated

Information available from the recovery plan (NMFS 1998), recent stock assessment reports (Carretta et al. 2016; Muto et al. 2016; Waring et al. 2016), and the status review (COSEWIC 2002) were used to summarize the life history, population dynamics and status of the species as follows.

6.2.1.1 Life History

The average life span of blue whales is eighty to ninety years. They have a gestation period of ten to twelve months, and calves nurse for six to seven months. Blue whales reach sexual maturity between five and fifteen years of age with an average calving interval of two to three years. They winter at low latitudes, where they mate, calve and nurse, and summer at high latitudes, where they feed. Blue whales forage almost exclusively on krill and can eat

approximately 3,600 kilograms daily. Feeding aggregations are often found at the continental shelf edge, where upwelling produces concentrations of krill at depths of 90 to 120 meters.

6.2.1.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the blue whale.

The global, pre-exploitation estimate for blue whales is approximately 181,200 (IWC 2007). Current estimates indicate approximately 5,000 to 12,000 blue whales globally (IWC 2007). Blue whales are separated into populations by ocean basin in the North Atlantic, North Pacific, and Southern Hemisphere. There are three stocks of blue whales designated in U.S. waters: the Eastern North Pacific [current best estimate N = 1,647, N_{min} = 1,551; (Mann 1999)] Central North Pacific (N = 81 N_{min} = 38), and Western North Atlantic (N = 400 to 600 N_{min} = 440). In the southern hemisphere, the latest abundance estimate for Antarctic blue whales is 2,280 individuals in 1997/1998 (95 percent confidence intervals 1,160-4,500) (Branch 2007). While no range-wide estimate for pygmy blue whales exists (Thomas et al. 2016), the latest estimate for pygmy blue whales off the west coast of Australia is 662 to 1,559 individuals based on passive acoustics (McCauley and Jenner 2010), or 712 to 1,754 individuals based on photographic mark-recapture (Jenner et al. 2008).

Current estimates indicate a growth rate of just under three percent per year for the eastern North Pacific stock (Calambokidis et al. 2009). An overall population growth rate for the species or growth rates for the two other individual U.S. stocks are not available at this time. In the southern hemisphere, population growth estimates are available only for Antarctic blue whales, which estimate a population growth rate of 8.2 percent per year (95 percent confidence interval 1.6–14.8 percent) (Branch 2007).

Little genetic data exist on blue whales globally. Data from Australia indicates that at least populations in this region experienced a recent genetic bottleneck, likely the result of commercial whaling, although genetic diversity levels appear to be similar to other, non-threatened mammal species (Attard et al. 2010). Consistent with this, data from Antarctica also demonstrate this bottleneck but high haplotype diversity, which may be a consequence of the recent timing of the bottleneck and blue whales long lifespan (Sremba et al. 2012). Data on genetic diversity of blue whales in the Northern Hemisphere are currently unavailable. However, genetic diversity information for similar cetacean population sizes can be applied. Stocks that have a total population size of 2,000 to 2,500 individuals or greater provide for maintenance of genetic diversity resulting in long-term persistence and protection from substantial environmental variance and catastrophes. Stocks that have a total population 500 individuals or less may be at a greater risk of extinction due to genetic risks resulting from inbreeding. Stock populations at low densities (less than 100) are more likely to suffer from the 'Allee' effect, where inbreeding and the heightened difficulty of finding mates reduces the population growth rate in proportion with reducing density.

In general, blue whale distribution is driven largely by food requirements; blue whales are more likely to occur in waters with dense concentrations of their primary food source, krill. While they can be found in coastal waters, they are thought to prefer waters further offshore (Figure 5). In the North Atlantic Ocean, the blue whale range extends from the subtropics to the Greenland Sea. They are most frequently sighted in waters off eastern Canada with a majority of sightings taking place in the Gulf of St. Lawrence. In the North Pacific Ocean, blue whales range from Kamchatka to southern Japan in the west and from the Gulf of Alaska and California to Costa Rica in the east. They primarily occur off the Aleutian Islands and the Bering Sea. In the northern Indian Ocean, there is a "resident" population of blue whales with sightings being reported from the Gulf of Aden, Persian Gulf, Arabian Sea, and across the Bay of Bengal to Burma and the Strait of Malacca. In the Southern Hemisphere, distributions of subspecies (*B. m. intermedia* and *B. m. brevicauda*) seem to be segregated. The subspecies *B. m. intermedia* occurs in relatively high latitudes south of the "Antarctic Convergence" (located between 48 degrees south and 61 degrees south latitude) and close to the ice edge. The subspecies *B. m. brevicauda* is typically distributed north of the Antarctic Convergence.

6.2.1.3 Status

The blue whale is endangered as a result of past commercial whaling. In the North Atlantic, at least 11,000 blue whales were taken from the late nineteenth to mid-twentieth centuries. In the North Pacific, at least 9,500 whales were killed between 1910 and 1965. Commercial whaling no longer occurs, but blue whales are threatened by vessel strikes, entanglement in fishing gear, pollution, harassment due to whale watching, and reduced prey abundance and habitat degradation due to climate change. Because populations appear to be increasing in size, the species appears to be somewhat resilient to current threats; however, the species has not recovered to pre-exploitation levels.

Status within the Action Area

Within the action area, two recognized U.S. stocks of blue whales can be found, the Eastern and Central North Pacific stocks. In addition, some Antarctic and pygmy blue whales may be found, although historic data indicate that few blue whales of either subspecies are likely to be found within the action area (Branch et al. 2007; Thomas et al. 2016). The Eastern North Pacific stock is primarily found feeding along the California coast in summer and fall, as they migrate down through southern California to spend winter and spring in the warmer, lower latitude waters off Baja California, in the Gulf of California, and on the Costa Rica Dome. Nonetheless, based on acoustic data, some individuals from this stock may range as far west as Wake Island, and as far south as the Equator (Carretta et al. 2016). The Central North Pacific stock's distribution remains largely unknown but individuals appear to feed in summer southwest of Kamchatka, south of the Aleutians, and in the Gulf of Alaska, and in winter migrate to lower latitudes in the western and central Pacific, including Hawaii. Given that the action area occurs mostly within tropical and subtropical waters, it encompasses calving grounds and migratory routes for blue whales. As such, all age and sex classes of blue whales are likely to be found within the action area.

The current best estimate for the population size of the Eastern North Pacific stock is 1,647, with a minimum population size estimate of 1,551 (Mann 1999). The current best estimate for the population size of the Central North Pacific stock is 81 individuals, with a minimum population size estimate of 38 (Carretta et al. 2016). The current best estimate for population size of Antarctic blue whales is 2,280 individuals, and while no data exist on the abundance of pygmy blue whales in the South Pacific, their global abundance is thought to be higher than that of Antarctic blue whales (Branch et al. 2007). In 2009 the growth rate of the Eastern North Pacific stock was estimated to be just under three percent per year (Calambokidis et al. 2009), but more recent support a stable population size with no increase or decrease (Carretta et al. 2016). In fact, in 2013 the Eastern North Pacific stock of blue whales was estimated to be at 97% of its carrying capacity, indicating that perhaps density dependent factors may be limiting population growth now rather than anthropogenic threats such as vessel strikes (Monnahan et al. 2015). There is currently no information available to estimate the population trend for the Central North Pacific stock of blue whales, nor pygmy blue whales. Antarctic blue whales are estimated to have an increasing population, with an estimated growth rate of 8.2 percent per year (Branch 2007).

6.2.1.4 Critical Habitat

No critical habitat has been designated for the blue whale.

6.2.1.5 Recovery Goals

See the 1998 Final Recovery Plan for the Blue whale for complete down listing/delisting criteria for each of the following recovery goals.

1. Determine stock structure of blue whale populations occurring in U.S. waters and elsewhere
2. Estimate the size and monitor trends in abundance of blue whale populations
3. Identify and protect habitat essential to the survival and recovery of blue whale populations
4. Reduce or eliminate human-caused injury and mortality of blue whales
5. Minimize detrimental effects of directed vessel interactions with blue whales
6. Maximize efforts to acquire scientific information from dead, stranded, and entangled blue whales
7. Coordinate state, federal, and international efforts to implement recovery actions for blue whales
8. Establish criteria for deciding whether to delist or downlist blue whales.

6.2.2 False Killer Whale (Main Hawaiian Islands Insular Distinct Population Segment)

False killer whales are distributed worldwide in tropical and temperate waters more than 1,000 meters deep. The Main Hawaiian Islands Insular DPS of false killer whales is found in waters around the Main Hawaiian Islands (Figure 7).

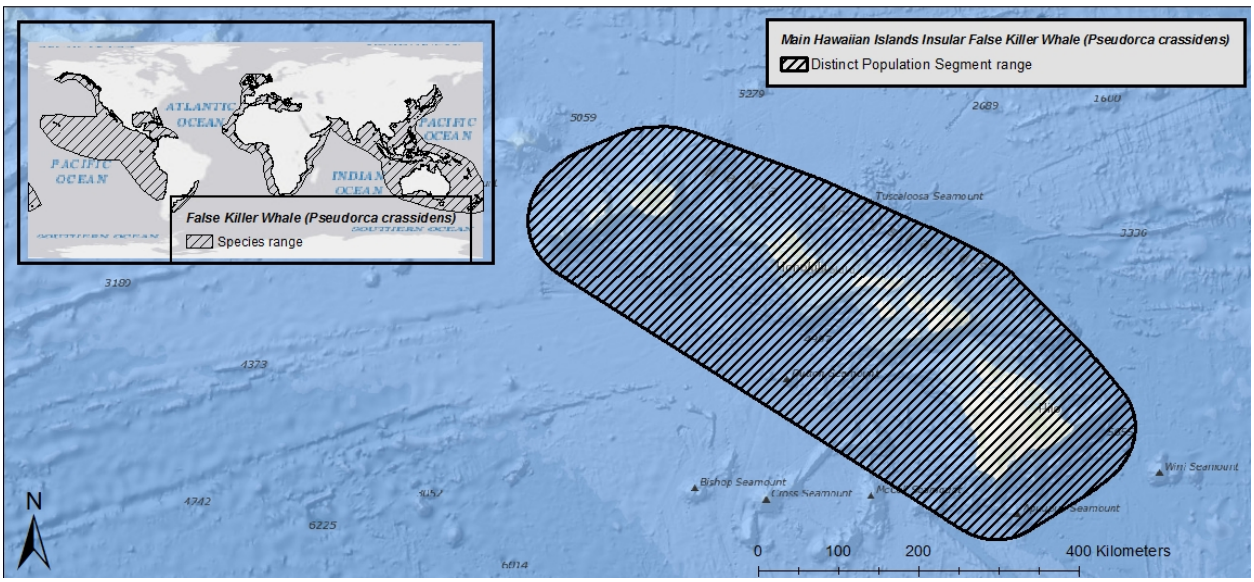

Figure 7: Map identifying the range of false killer whales and the Main Hawaiian Islands Insular distinct population segment of false killer whale.

The false killer whale is a toothed whale and large member of the dolphin family. False killer whales are distinguishable from other whales by having a small conical head without a beak, tall dorsal fin, and a distinctive bulge in the middle of the front edge of their pectoral fins (Figure 8). The Main Hawaiian Islands Insular DPS of false killer whale was originally listed as endangered on November 28, 2012 (Table 4).

Figure 8: False killer whale. Photo: National Oceanic and Atmospheric Administration.

Table 4. Main Hawaiian Islands Insular distinct population segment False killer whale information bar provides species Latin name, common name and current Federal Register notice of listing status, designated critical habitat, Distinct Population Segment/Evolutionary Significant Unit, recent status review, and recovery plan.

Species	Common Name	Distinct Population Segment	ESA Status	Recent Review Year	Listing	Recovery Plan	Critical Habitat
Pseudorca crassidens	False killer whale	Main Hawaiian Islands Insular	Endangered	2010	77 FR 70915	None	None Designated

Information available from the most recent status review (Oleson et al. 2010) and recent stock assessment (Carretta et al. 2011) were used to summarize the status of the species as follows.

6.2.2.1 Life History

False killer whales can live, on average, for 60 years. They have a gestation period of 14 to 16 months, and calves nurse for 1.5 to two years. Sexual maturity is reached around 12 years of age with a very low reproduction rate and calving interval of approximately seven years. False killer whales prefer tropical to temperate waters that are deeper than 1,000 meters. They feed during the day and at night on fishes and cephalopods, and are known to attack other marine mammals, indicating they may occasionally feed on them.

6.2.2.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the Main Hawaiian Islands Insular DPS of false killer whales.

Recent, unpublished estimates of abundance for two time periods, 2000 to 2004 and 2006 to 2009, were 162 and 151 respectively. The minimum population estimate for the Main Hawaiian Islands Insular DPS of false killer whale is the number of distinct individuals identified during the 2011 to 2014 photo-identification studies, or ninety-two false killer whales (Baird et al. 2015).

A current estimated population growth rate for the Main Hawaiian Islands Insular DPS of false killer whales is not available at this time. Reeves et al. (2009) suggested that the population may have declined during the last two decades, based on sighting data collected near Hawaii using various methods between 1989 and 2007. A modeling exercise conducted by Oleson et al. (2010) evaluated the probability of actual or near extinction, defined as fewer than 20 animals, given measured, estimated, or inferred information on population size and trends, and varying impacts of catastrophes, environmental stochasticity and Allee effects. A variety of alternative scenarios were evaluated indicating the probability of decline to fewer than 20 animals within 75 years as greater than 20 percent. Although causation was not evaluated, all models indicated current declines at an average rate of negative nine percent since 1989.

The Main Hawaiian Islands Insular DPS of false killer whale is considered resident to the Main Hawaiian Islands and is genetically and behaviorally distinct compared to other stocks. Genetic data suggest little immigration into the Main Hawaiian Islands Insular DPS of false killer whale (Baird et al. 2012). Genetic analyses indicated restricted gene flow between false killer whales sampled near the Main Hawaiian Islands, the Northwestern Hawaiian Islands, and pelagic waters of the Eastern and Central North Pacific.

NMFS currently recognizes three stocks of false killer whales in Hawaiian waters: the Main Hawaiian Islands Insular, Hawaii pelagic, and the Northwestern Hawaiian Islands. All false killer whales found within forty kilometers of the Main Hawaiian Islands belong to the insular stock and all false killer whales beyond 140 kilometers belong to the pelagic stock. Animals belonging to the Northwest Hawaiian Islands stock are insular to the Northwest Hawaiian Islands (Bradford et al. 2012), however, this stock was identified by animals encountered off Kauai.

6.2.2.3 Status

The exact causes for the decline in the Main Hawaiian Islands Insular DPS of the false killer whale are not specifically known, but multiple factors have threatened and continue to threaten the population. Threats to the DPS include small population size, including inbreeding depression and Allee effects, exposure to environmental contaminants, competition for food with commercial fisheries, and hooking, entanglement, or intentional harm by fishermen. Recent photographic evidence of dorsal fin disfigurements and mouthline injuries suggest a high rate of

fisheries interactions for this population compared to others in Hawaiian waters (Baird et al. 2015).

6.2.2.4 Critical Habitat

No critical habitat has been designated for the Main Hawaiian Islands Insular DPS of the false killer whale.

6.2.2.5 Recovery Goals

There is currently no Recovery Plan available for the Main Hawaiian Islands Insular DPS of the false killer whale.

6.2.3 Fin Whale

The fin whale is a large, widely distributed baleen whale found in all major oceans and comprised of three subspecies: *B. p. physalus* in the Northern Hemisphere, and *B. p. quoyi* and *B. p. patachonica* (a pygmy form) in the Southern Hemisphere (Figure 9).

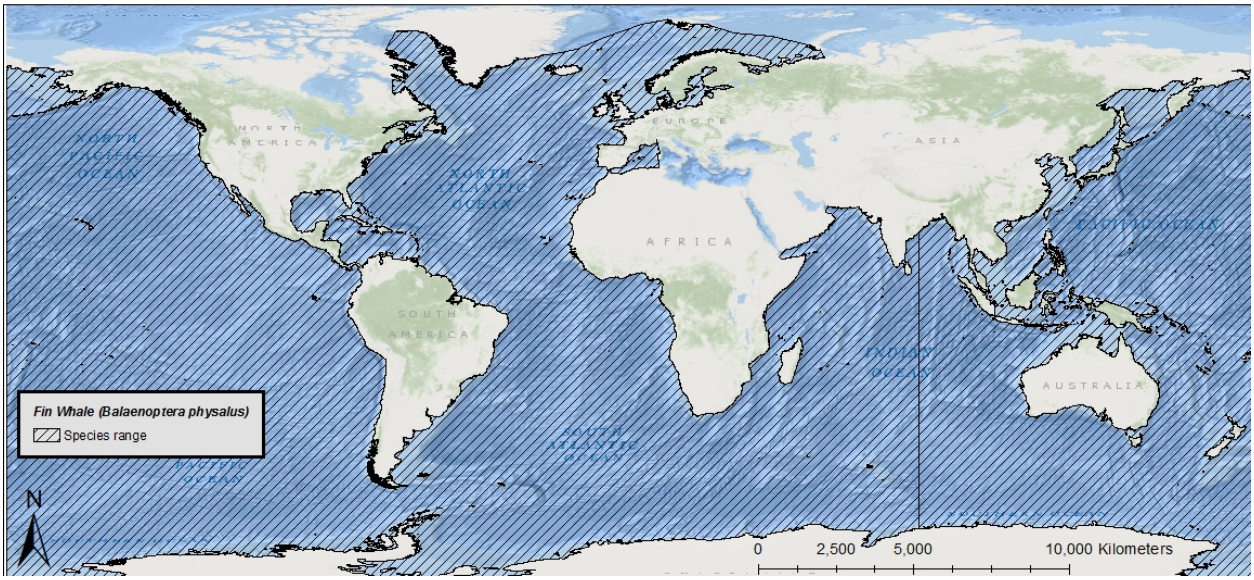

Figure 9: Map identifying the range of the fin whale.

Fin whales are distinguishable from other whales by a sleek, streamlined body with a V-shaped head, a tall, falcate dorsal fin, and a distinctive color pattern of a black or dark brownish-gray body and sides with a white ventral surface (Figure 10). The fin whale was originally listed as endangered on December 2, 1970 (Table 5).

Figure 10: Fin whale. Photo: National Oceanic and Atmospheric Administration

Table 5: Fin whale information bar provides species Latin name, common name and current Federal Register notice of listing status, designated critical habitat, Distinct Population Segment/Evolutionary Significant Unit, recent status review, and recovery plan.

Species	Common Name	Distinct Population Segment	ESA Status	Recent Review Year	Listing	Recovery Plan	Critical Habitat
Balaenoptera physalus	Fin whale	None	Endangered: range wide	2011	35 FR 18319	2010	None Designated

Information available from the recovery plan (NMFS 2010c), recent stock assessment reports (Carretta et al. 2016; Muto et al. 2016; Waring et al. 2016), and the status review (NMFS 2011a) were used to summarize the life history, population dynamics and status of the species as follows.

6.2.3.1 Life History

Fin whales can live, on average, eighty to ninety years. They have a gestation period of less than one year, and calves nurse for six to seven months. Sexual maturity is reached between six and ten years of age with an average calving interval of two to three years. They mostly inhabit deep, offshore waters of all major oceans. They winter at low latitudes, where they calve and nurse, and summer at high latitudes, where they feed, although some fin whales appear to be residential to certain areas. Fin whales eat pelagic crustaceans (mainly euphausiids or krill) and schooling fish such as capelin, herring, and sand lice.

6.2.3.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the fin whale.

The pre-exploitation estimate for the fin whale population in the North Pacific was 42,000 to 45,000 (Ohsumi and Wada 1974). In the North Pacific, at least 74,000 whales were killed between 1910 and 1975. In the North Atlantic, at least 55,000 fin whales were killed between 1910 and 1989. Approximately 704,000 whales were killed in the Southern Hemisphere from 1904 to 1975. Of the three to seven stocks in the North Atlantic (approximately 50,000 individuals), one occurs in U.S. waters, where the best estimate of abundance is 1,618 individuals (N_{min}=1,234); however, this may be an underrepresentation as the entire range of stock was not surveyed (Palka 2012). There are three stocks in U.S. Pacific waters: Northeast Pacific [minimum 1,368 individuals], Hawaii [approximately 58 individuals (N_{min}=27)] and California/Oregon/Washington [approximately 9,029 (N_{min}=8,127 individuals), (Nadeem et al. 2016)]. The International Whaling Commission (IWC) also recognizes the China Sea stock of fin whales, found in the Northwest Pacific, which currently lacks and abundance estimate (Reilly et al. 2013). Abundance data for the Southern Hemisphere stock are limited; however, there were assumed to be somewhat more than 15,000 in 1983 (Thomas et al. 2016).

Current estimates indicate approximately 10,000 fin whales in U.S. Pacific Ocean waters, with an annual growth rate of 4.8 percent in the Northeast Pacific stock and a stable population abundance in the California/Oregon/Washington stock (Nadeem et al. 2016). Overall population growth rates and total abundance estimates for the Hawaii stock, China Sea stock, western north Atlantic stock, and southern hemisphere fin whales are not available at this time.

Archer et al. (2013) recently examined the genetic structure and diversity of fin whales globally. Full sequencing of mtDNA genome for 154 fin whales sampled in the North Atlantic, North Pacific, and Southern Hemisphere, resulted in 136 haplotypes, none of which were shared among ocean basins suggesting differentiation at least at this geographic scale. However, North Atlantic fin whales appear to be more closely related to the Southern Hemisphere population, as compared to fin whales in the North Pacific, which may indicate a revision of the subspecies delineations is warranted. Generally speaking, haplotype diversity was found to be high both within ocean basins, and across. Such high genetic diversity and lack of differentiation within ocean basins may indicate that despite some population's having small abundance estimates, the species may persist long-term and be somewhat protected from substantial environmental variance and catastrophes.

There are over 100,000 fin whales worldwide, occurring primarily in the North Atlantic, North Pacific, and Southern Hemisphere (Figure 9), where they appear to be reproductively isolated. The availability of prey, sand lice in particular, is thought to have a strong influence on the distribution and movements of fin whales.

6.2.3.3 Status

The fin whale is endangered as a result of past commercial whaling. Prior to commercial whaling, hundreds of thousands of fin whales existed. Fin whales may be killed under "aboriginal subsistence whaling" in Greenland, under Japan's scientific whaling program, and Iceland's formal objection to the IWC's ban on commercial whaling. Additional threats include vessel strikes, reduced prey availability due to overfishing or climate change, and noise. The species' overall large population size may provide some resilience to current threats, but trends are largely unknown.

Status within the Action Area

Within the action area, the Northeast Pacific, Hawaii, and China Sea stocks of fin whales occur. In addition, both subspecies of southern hemisphere fin whales may be found. Fin whales form the Northeastern Pacific stock occur seasonally off the northwestern coast of north America and in the Bering Sea, with peak sightings and acoustic detections occurring primarily between late summer and late fall. As they are in most eastern tropical Pacific waters, Fin whales are rarely sighted off of Hawaii, so the distribution of this stock remains largely unknown. For management purposes, the Hawaii stock of fin whales is considered to consist of those fin whales found within the U.S. exclusive economic zone and international waters surrounding Hawaii. Little is known about the China Sea stock of fin whales, but they are assumed to be found Korean peninsula and southern and central Japan (Reilly et al. 2013). Given this diversity of habitat use patterns by fin whales, it is likely that all age classes may be found within the action area.

The best abundance estimate for the Eastern North Pacific stock is a minimum of approximately 1,368 individuals. The annual growth rate for this stock is estimated to be 4.8 percent, with confidence intervals between 4.1 and 5.4 percent (Zerbini et al. 2006). The best abundance estimate for the Hawaii stock of fin whales is approximately 58 individuals, but no population trend data are available. No information is available on the China Sea stock of find whales regarding their current abundance or population trend. For the southern hemisphere, little data exist but the population was thought number somewhat more than 15,000 in 1983 (Thomas et al. 2016), but population trends remain unknown.

6.2.3.4 Critical Habitat

No critical habitat has been designated for the fin whale.

6.2.3.5 Recovery Goals

See the 2010 Final Recovery Plan for the fin whale for complete down listing/delisting criteria for both of the following recovery goals.

1. Achieve sufficient and viable population in all ocean basins.
2. Ensure significant threats are addressed.

6.2.4 Humpback Whale (Western North Pacific Distinct Population Segment)

The humpback whale is a widely distributed baleen whale found in all major oceans (Figure 11).

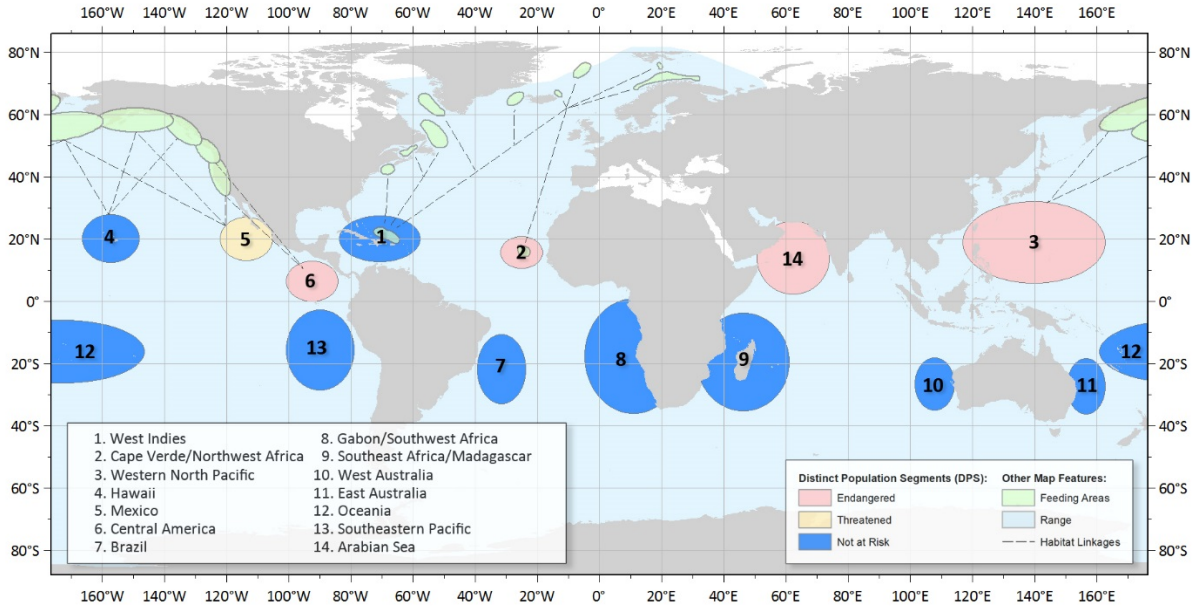

Figure 11: Map identifying 14 distinct population segments with one threatened and four endangered, based on primary breeding location of the humpback whale, their range, and feeding areas (Bettridge et al. 2015).

Humpbacks are distinguishable from other whales by long pectoral fins and are typically dark grey with some areas of white (Figure 12). The humpback whale was originally listed as endangered on December 2, 1970. Since then, NMFS has designated fourteen DPSs with four identified as endangered (Cape Verde Islands/Northwest Africa, Western North Pacific, Central America, and Arabian Sea) and one as threatened (Mexico) (Figure 11Table 6). Only the Western North Pacific DPS is further discussed below, as this is the only ESA-listed DPS found within the action area.

Figure 12: Humpback whale. Photo: National Oceanic and Atmospheric Administration

Table 6: Humpback whale Western North Pacific distinct population segment information bar provides species Latin name, common name, current and proposed Federal Register notice of listing status, designated critical habitat, Distinct Population Segment, recent status review, and recovery plan.

Species	Common Name	Distinct Population Segment	ESA Status	Recent Review Year	Listing	Recovery Plan	Critical Habitat
Megaptera novaeangliae	Humpback whale	Western North Pacific	Endangered	2015	81 FR 62259	1991	None Designated

Information available from the recovery plan (NMFS 1991), recent stock assessment reports (Carretta et al. 2016; Muto et al. 2016; Waring et al. 2016), the status review (Bettridge et al. 2015), and the final listing were used to summarize the life history, population dynamics and status of the species as follows.

6.2.4.1 Life History

Humpbacks can live, on average, fifty years. They have a gestation period of eleven to twelve months, and calves nurse for one year. Sexual maturity is reached between five to eleven years of age with an average calving interval of two to three years. Humpbacks mostly inhabit coastal and continental shelf waters. They winter at low latitudes, where they calve and nurse, and summer at high latitudes, where they feed. Humpbacks exhibit a wide range of foraging behaviors and feed

on a range of prey types, including: small schooling fishes, euphausiids, and other large zooplankton (Bettridge et al. 2015).

6.2.4.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the Western North Pacific humpback whale DPS.

The global, pre-exploitation estimate for humpback whales is 1,000,000 (Roman and Palumbi 2003). The current abundance of the Western North Pacific DPS is 1,059. A population growth rate is currently unavailable for the Western North Pacific humpback whale DPS.

For humpback whales, distinct population segments that have a total population size of 2,000 to 2,500 individuals or greater provide for maintenance of genetic diversity resulting in long-term persistence and protection from substantial environmental variance and catastrophes. Distinct population segments that have a total population five hundred individuals or less may be at a greater risk of extinction due to genetic risks resulting from inbreeding. Populations at low densities (less than one hundred) are more likely to suffer from the 'Allee' effect, where inbreeding and the heightened difficulty of finding mates reduces the population growth rate in proportion with reducing density. The Western North Pacific DPS has less than 2,000 individuals total, and is made up of two subpopulations, Okinawa/Philippines and the Second West Pacific. Thus, while its genetic diversity may be protected from moderate environmental variance, it could be subject to extinction due to genetic risks due to low abundance (Bettridge et al. 2015).

The Western North Pacific DPS consists of humpback whales breeding/wintering in the area of Okinawa and the Philippines, another unidentified breeding area (inferred from sightings of whales in the Aleutian Islands area feeding grounds), and those transiting from the Ogasawara area. These whales migrate to feeding grounds in the northern Pacific, primarily off the Russian coast (Figure 11).

6.2.4.3 Status

Humpback whales were originally listed as endangered as a result of past commercial whaling, and the five DPSs that remain listed (Cape Verde Islands/Northwest Africa, Western North Pacific, Central American, Arabian Sea, and Mexico) have likely not yet recovered from this. Prior to commercial whaling, hundreds of thousands of humpback whales existed. Global abundance declined to the low thousands by 1968, the last year of substantial catches (IUCN 2012). Humpback whales may be killed under "aboriginal subsistence whaling" and "scientific permit whaling" provisions of the International Whaling Commission. Additional threats include ship strikes, fisheries interactions (including entanglement), energy development, harassment from whale watching, noise, harmful algal blooms, disease, parasites, and climate change. The species' large population size and increasing trends indicate that it is resilient to current threats, but the Western North Pacific DPS still faces a risk of extinction.

6.2.4.4 Critical Habitat

No critical habitat has been designated for humpback whales.

6.2.4.5 Recovery Goals

See the 1991 Final Recovery Plan for the Humpback whale for complete down listing/delisting criteria for each of the four following recovery goals:

1. Maintain and enhance habitats used by humpback whales currently or historically.
2. Identify and reduce direct human-related injury and mortality.
3. Measure and monitor key population parameters.
4. Improve administration and coordination of recovery program for humpback whales.

6.2.5 North Pacific Right Whale

North Pacific right whales are found in temperate and sub-polar waters of the North Pacific Ocean (Figure 13).

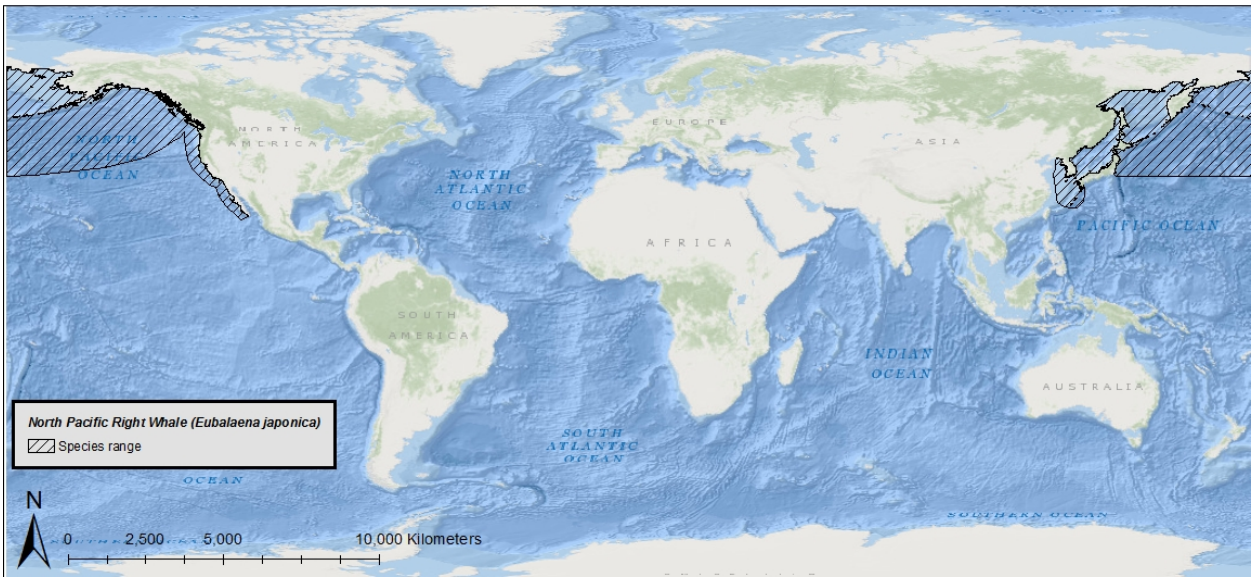

Figure 13: Map identifying the range of the North Pacific right whale.

The North Pacific right whale is a baleen whale found only in the North Pacific Ocean and is distinguishable by a stocky body, lack of dorsal fin, generally black coloration, and callosities on the head region (Figure 14). The species was originally listed with the North Atlantic right whale (i.e., “Northern” right whale) as endangered on December 2, 1970. The North Pacific right whale was listed separately as endangered on March 6, 2008.

Figure 14: North Pacific right whale. Photo: National Oceanic and Atmospheric Administration

Table 7: North Pacific right whale information bar provides species Latin name, common name and current Federal Register notice of listing status, designated critical habitat, Distinct Population Segment/Evolutionary Significant Unit, recent status review, and recovery plan.

Species	Common Name	Distinct Population Segment	ESA Status	Recent Review Year	Listing	Recovery Plan	Critical Habitat
Eubalaena japonica	North Pacific right whale	None	Endangered	2012	73 FR 12024	2013	73 FR 19000

Information available from the recovery plan (NMFS 2013) recent stock assessment reports (Carretta et al. 2016; Muto et al. 2016; Waring et al. 2016), and status review (NMFS 2012a) were used to summarize the life history, population dynamics and status of the species as follows.

6.2.5.1 Life History

North Pacific right whales can live, on average, 50 or more years. They have a gestation period of approximately one year, and calves nurse for approximately one year. Sexual maturity is reached between nine and 10 years of age. The reproduction rate of North Pacific right whales remains unknown. However, it is likely low due to a male-biased sex ratio that may make it

difficult for females to find viable mates. North Pacific right whales mostly inhabit coastal and continental shelf waters. Little is known about their migration patterns, but they have been observed in lower latitudes during winter (Japan, California, and Mexico) where they likely calve and nurse. In the summer, they feed on large concentrations of copepods in Alaskan waters. North Pacific right whales are unique compared to other baleen whales in that they are skim feeders meaning they continuously filtering through their baleen while moving through a patch of zooplankton.

6.2.5.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. This section includes abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the North Pacific right whale.

The North Pacific right whale remains one of the most endangered whale species in the world. Their abundance likely numbers fewer than 1,000 individuals. There are two currently recognized stocks of North Pacific right whales, a Western North Pacific stock that feeds primarily in the Sea of Okhotsk, and an Eastern North Pacific stock that feeds eastern north Pacific waters off Alaska, Canada, and Russia. Several lines of evidence indicate a total population size of less than 100 for the Eastern North Pacific stock. Based on photo-identification from 1998 to 2013 (Wade et al. 2011) estimated 31 individuals, with a minimum population estimate of 25.7 individuals. Genetic data have identified 23 individuals based on samples collected between 1997 and 2011 (LeDuc et al. 2012). The Western North Pacific stock is likely more abundant and was estimated to consist of 922 whales (95 percent confidence intervals 404 to 2,108) based on data collected in 1989, 1990, and 1992 (IWC 2001; Thomas et al. 2016). While there have been several sightings of Western North Pacific right whales in recent years, with one sighting identifying at least 77 individuals, these data have yet to be compiled to provide a more recent abundance estimate (Thomas et al. 2016). There is currently no information on population trends for either stock of North Pacific right whales.

As a result of past commercial whaling, the remnant population of North Pacific right whales has been left vulnerable to genetic drift and inbreeding due to low genetic variability. This low diversity potentially affects individuals by depressing fitness, lowering resistance to disease and parasites, and diminishing the whales' ability to adapt to environmental changes. At the population level, low genetic diversity can lead to slower growth rates, lower resilience, and poorer long-term fitness (Lacy 1997). Marine mammals with an effective population size of a few dozen individuals likely can resist most of the deleterious consequences of inbreeding (Lande 1991). It has also been suggested that if the number of reproductive animals is fewer than fifty, the potential for impacts associated with inbreeding increases substantially. Rosenbaum et al. (2000) found that historic genetic diversity of North Pacific right whales was relatively high compared to North Atlantic right whales, but samples from extant individuals showed very low genetic diversity, with only two matrilineal haplotypes among the five samples in their dataset.

The North Pacific right whale inhabits the Pacific Ocean, particularly between 20 and 60 degrees latitude (Figure 13). Prior to exploitation by commercial whalers, concentrations of right whales in the North Pacific where found in the Gulf of Alaska, Aleutian Islands, south central Bering Sea, Sea of Okhotsk, and Sea of Japan. There has been little recent sighting data of right whales occurring in the central North Pacific and Bering Sea. However, since 1996, North Pacific right whales have been consistently observed in Bristol Bay and the southeastern Bering Sea during summer months. In the Western North Pacific where the population is thought to be somewhat larger, right whales have been sighted in the Sea of Okhotsk and other areas off the coast of Japan, Russia, and South Korea (Thomas et al. 2016). Although North Pacific right whales are typical found in higher latitudes, they are thought to migrate to more temperate waters during winter to reproduce, and have been sighted as far south as Hawaii and Baja California.

6.2.5.3 Status

The North Pacific right whale is endangered as a result of past commercial whaling. Prior to commercial whaling, abundance has been estimated to have been more than 11,000 individuals. Current threats to the survival of this species include hunting, vessel strikes, climate change, and fisheries interactions (including entanglement). The resilience of North Pacific right whales to future perturbations is low due to its small population size and continued threats. Recovery is not anticipated in the foreseeable future (several decades to a century or more) due to small population size and lack of available current information.

6.2.5.4 Critical Habitat

In 2008, NMFS designated critical habitat for the North Pacific right whale, which includes an area in the Southeast Bering Sea and an area south of Kodiak Island in the Gulf of Alaska (Figure 15). These areas are influenced by large eddies, submarine canyons, or frontal zones which enhance nutrient exchange and act to concentrate prey. These areas are adjacent to major ocean currents and are characterized by relatively low circulation and water movement. Both critical habitat areas support feeding by North Pacific right whales because they contain the designated physical and biological features (previously referred to as primary constituent elements), which include: nutrients, physical oceanographic processes, certain species of zooplankton, and a long photoperiod due to the high latitude. Consistent North Pacific right whale sightings are a proxy for locating these elements.

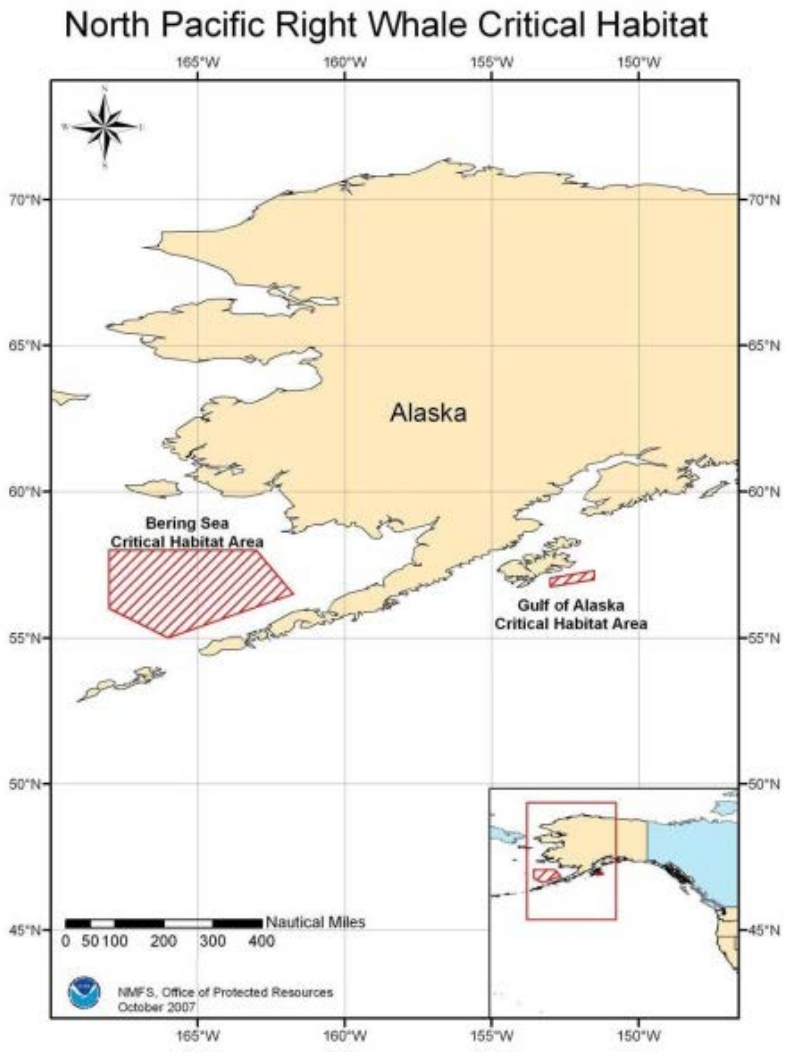

Figure 15: Map identifying designated critical habitat for the North Pacific right whale in the Southeast Bering Sea and south of Kodiak Island in the Gulf of Alaska.

6.2.5.5 Recovery Goals

See the 2013 Final Recovery Plan for the North Pacific right whale for complete down listing/delisting criteria for both of the following recovery goals.

1. Achieve sufficient and viable populations in all ocean basins.
2. Ensure significant threats are addressed.

6.2.6 Sei Whale

The sei whale is a widely distributed baleen whale found in all major oceans (Figure 16).

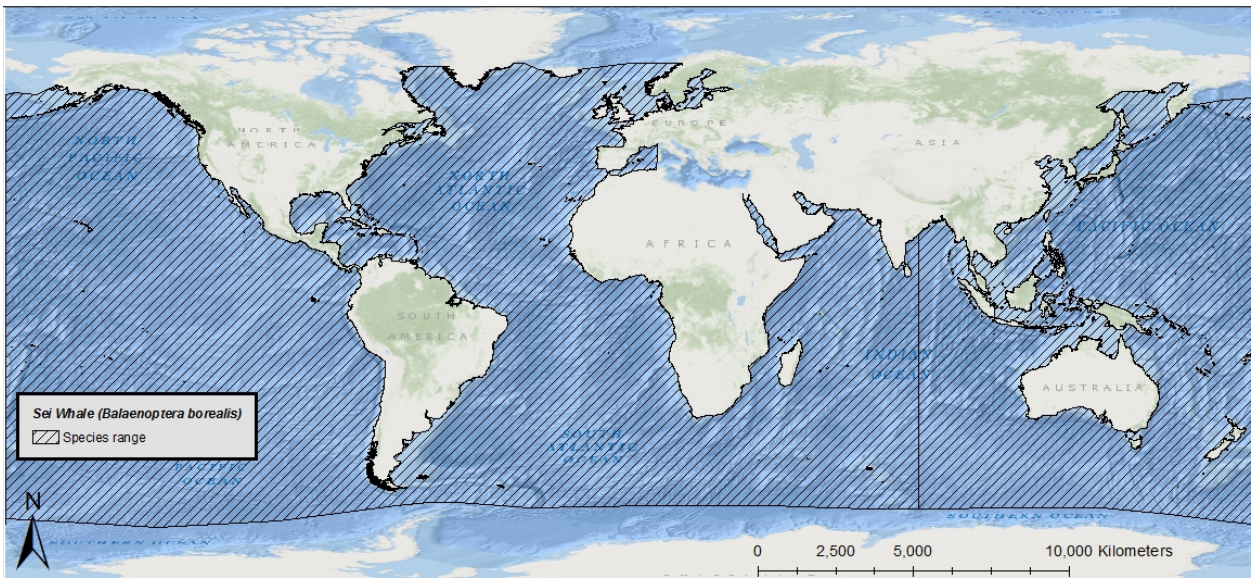

Figure 16: Map showing the range of the sei whale.

Sei whales are distinguishable from other whales by a long, sleek body that is dark bluish-gray to black in color and pale underneath, and a single ridge located on their rostrum (Figure 17). The sei whale was originally listed as endangered on December 2, 1970. Information available from the recovery plan (NMFS 2011b), recent stock assessment reports (Carretta et al. 2016; Muto et al. 2016; Waring et al. 2016), and status review (NMFS 2012c) were used to summarize the status of the species as follows.

Figure 17: Sei whale. Photo: National Oceanic and Atmospheric Administration

Table 8: Sei whale information bar provides species Latin name, common name, Federal Register notice of listing status, designated critical habitat, Distinct Population Segment/Evolutionary Significant Unit, recent status review, and recovery plan for sei whale.

Species	Common Name	Distinct Population Segment	ESA Status	Recent Review Year	Listing	Recovery Plan	Critical Habitat
Balaenoptera borealis	Sei whale	None	Endangered: range-wide	2012	35 FR 18319	2011	None Designated

6.2.6.1 Life History

Sei whales can live, on average, between 50 to 70 years. They have a gestation period of 10 to 12 months, and calves nurse for six to nine months. Sexual maturity is reached between six and 12 years of age with an average calving interval of two to three years. Sei whales mostly inhabit continental shelf and slope waters far from the coastline. They winter at low latitudes, where they calve and nurse, and summer at high latitudes, where they feed on a range of prey types, including zooplankton (copepods and krill), small schooling fishes, and cephalopods.

6.2.6.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. This section is broken down into: abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the sei whale.

Two subspecies of sei whale are recognized, *B. b. borealis* in the Northern Hemisphere and *B. b. schlegellii* in the Southern Hemisphere. There are no estimates of pre-exploitation abundance for sei whales in the North Atlantic. Models indicate that total abundance declined from 42,000 to 8,600 between 1963 and 1974 in the North Pacific. More recently, the North Pacific population was estimated to be 29,632 (95 percent confidence intervals 18,576 to 47,267) between 2010 and 2012 (IWC 2016; Thomas et al. 2016). In the Southern Hemisphere, pre-exploitation abundance is estimated at 65,000 whales, with recent abundance estimated ranging from 9,800 to 12,000. Three relatively small stocks occur in U.S. waters: Nova Scotia (N=357, N_{min}=236), Hawaii (N=178, N_{min}=93), and Eastern North Pacific (N=126, N_{min}=83). Population growth rates for sei whales are not available at this time as there are little to no systematic survey efforts to study sei whales.

While some genetic data exist sei whales, current samples sizes are small limiting our confidence in their estimates of genetic diversity (NMFS 2011b). However, genetic diversity information for similar cetacean population sizes can be applied. Stocks that have a total population size of 2,000 to 2,500 individuals or greater provide for maintenance of genetic diversity resulting in long-term persistence and protection from substantial environmental variance and catastrophes. Stocks that have a total population 500 individuals or less may be at a greater risk of extinction due to genetic risks resulting from inbreeding. Stock populations at low densities (<100) are more likely to suffer from the 'Allee' effect, where inbreeding and the heightened difficulty of finding mates reduces the population growth rate in proportion with reducing density. All stocks of sei whales within U.S. waters are estimated to be below 500 individuals indicating they may be at risk of extinction due to inbreeding.

Sei whales are distributed worldwide, occurring in the North Atlantic, North Pacific, and Southern Hemisphere (Figure 16).

6.2.6.3 Status

The sei whale is endangered as a result of past commercial whaling. Now, only a few individuals are taken each year by Japan; however, Iceland has expressed an interest in targeting sei whales. Current threats include vessel strikes, fisheries interactions (including entanglement), climate change (habitat loss and reduced prey availability), and anthropogenic sound. Given the species' overall abundance, they may be somewhat resilience to current threats. However, trends are largely unknown, especially for individual stocks, many of which have relatively low abundance estimates.

Status within the Action Area

Within the action area, the Eastern North Pacific and Hawaii stocks of sei whales occur, as well other North Pacific populations of sei that are currently unresolved (Thomas et al. 2016). In addition, individuals from currently unknown populations of the southern hemisphere subspecies may be found. Given that very little research has been conducted on sei whales globally, the details of their distribution within the action area remains unknown. Nonetheless, like other baleen whales they are thought to feed at higher latitudes and breed at lower latitudes within the action area, and as such, all age and sexes classes of sei whale are expected to occur within the action area.

The best estimate for sei whales in the North Pacific is 29,632 for the period of 2010 and 2012 (IWC 2016; Thomas et al. 2016), with the best estimates for the Hawaii and Eastern North Pacific stock 178 and 126 respectively. Data are limited for the southern hemisphere, but the latest abundance estimate range between 9,800 and 12,000. No data on population trends are available for sei whales.

6.2.6.4 Critical Habitat

No critical habitat has been designated for the sei whale.

6.2.6.5 Recovery Goals

See the 2011 Final Recovery Plan for the sei whale for complete down listing/delisting criteria for both of the following recovery goals:

1. Achieve sufficient and viable populations in all ocean basins.
2. Ensure significant threats are addressed.

6.2.7 Sperm Whale

The sperm whale is a widely distributed toothed whale found in all major oceans (Figure 18).

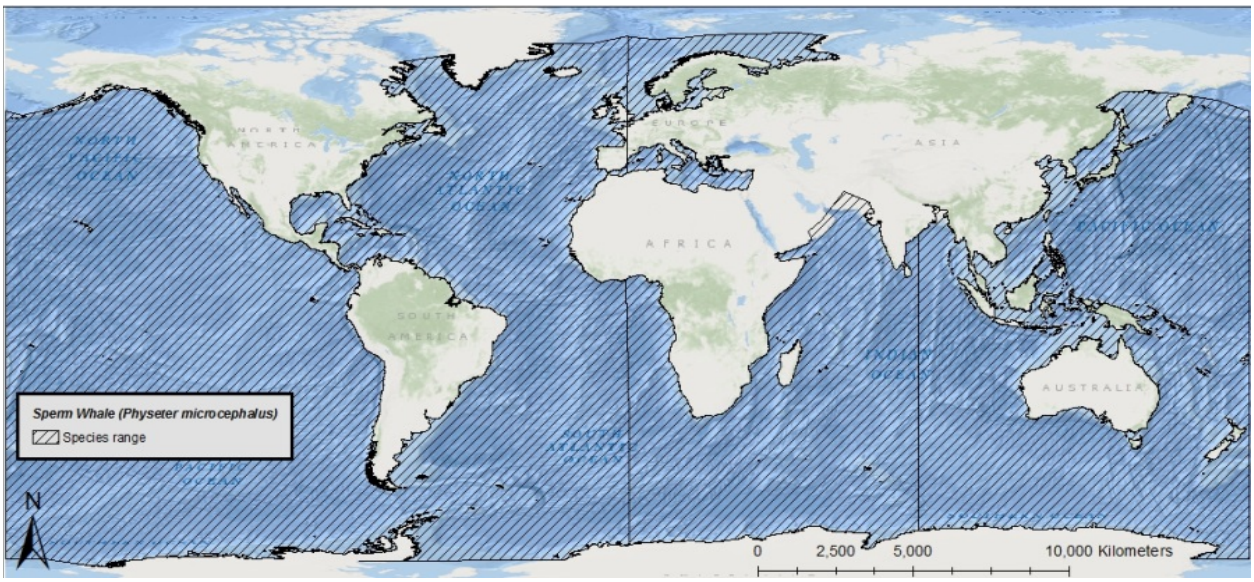

Figure 18: Map showing the range of the sperm whale.

They are the largest toothed whale and distinguishable from other whales by an extremely large head, which takes up to 25 to 35 percent of their total body length, and a single blowhole asymmetrically situated on the left side of the head near the tip (Figure 19). The sperm whale was originally listed as endangered on December 2, 1970. Information available from the recovery plan (NMFS 2010b), recent stock assessment reports (Carretta et al. 2016; Muto et al. 2016; Waring et al. 2016), and status review (NMFS 2015d) were used to summarize the status of the species as follows.

Figure 19: Sperm whale. Photo: National Oceanic and Atmospheric Administration

Table 9: Sperm whale information bar provides species Latin name, common name, current and proposed Federal Register notice of listing status, designated critical habitat, Distinct Population Segment/Evolutionary Significant Unit, recent status review, and recovery plan.

Species	Common Name	Distinct Population Segment	ESA Status	Recent Review Year	Listing	Recovery Plan	Critical Habitat
Physeter microcephalus	Sperm whale	None	Endangered: range-wide	2015	35 FR 18319	2010	None Designated

6.2.7.1 Life History

The average lifespan of sperm whales is estimated to be at least 50 years (Whitehead 2009). They have a gestation period of one to one and a half years, and calves nurse for approximately two years. Sexual maturity is reached between seven to 13 years of age for females with an average calving interval of four to six years. Male sperm whales reach full sexual maturity in their 20s. Sperm whales mostly inhabit areas with a water depth of 600 meters or more, and are uncommon in waters less than 300 meters deep. They winter at low latitudes, where they calve and nurse, and summer at high latitudes, where they feed primarily on squid; other prey include octopus and demersal fish (including teleosts and elasmobranchs).

6.2.7.2 Population Dynamics

The following is a discussion of the species' population and its variance over time. This section is broken down into: abundance, population growth rate, genetic diversity, and spatial distribution as it relates to the sperm whale.

The sperm whale is the most abundant of the large whale species, with total abundance estimates between 200,000 and 1,500,000. The most recent estimate indicated a global population of between 300,000 and 450,000 individuals (Whitehead 2009). The higher estimates may be approaching population sizes prior to commercial whaling, the reason for ESA listing. There are no reliable estimates for sperm whale abundance across the entire Atlantic Ocean. However, estimates are available for two of the three U.S. stocks in the Atlantic, the Northern Gulf of Mexico stock, estimated to consists of 763 individuals (N_{min}=560) and the North Atlantic stock, underestimated to consists of 2,288, individuals (N_{min}=1,815). There are insufficient data to estimate abundance for the Puerto Rico and the U.S. Virgin Islands stock. In the northeast Pacific, the abundance of sperm whales was estimated to be between 26,300 and 32,100 in 1997. In the eastern tropical Pacific, the abundance of sperm whales was estimated to be 22,700 (95 percent confidence intervals 14,800 to 34,600) in 1993. Population estimates are also available for two of the three U.S. stocks that occur in the Pacific, the California/Oregon/Washington stock, estimated to consist of 2,106 individuals (N_{min}=1,332), and the Hawaii stock, estimated to consist of 3,354 individuals (N_{min}=2,539). There are insufficient data to estimate the population abundance of the North Pacific stock. We are aware of no reliable abundance estimates specifically for sperm whales in the South Pacific, and there is insufficient data to evaluate trends in abundance and growth rates of sperm whale populations at this time.

Ocean-wide genetic studies indicate sperm whales have low genetic diversity, suggesting a recent bottleneck, but strong differentiation between matrilineally related groups (Lyrholm and Gyllensten 1998). Consistent with this, two studies of sperm whales in the Pacific indicate low genetic diversity (Mesnick et al. 2011; Rendell et al. 2012). Furthermore, sperm whales from the Gulf of Mexico, the western North Atlantic, the North Sea, and the Mediterranean Sea all have been shown to have low levels of genetic diversity (Engelhaupt et al. 2009). As none of the stocks for which data are available have high levels of genetic diversity, the species may be at some risk to inbreeding and 'Allee' effects, although the extent to which is currently unknown.

Sperm whales have a global distribution and can be found in relatively deep waters in all ocean basins (Figure 18). While both males and females can be found in latitudes less than 40 degrees, only adult males venture into the higher latitudes near the poles.

6.2.7.3 Status

The sperm whale is endangered as a result of past commercial whaling. Although the aggregate abundance worldwide is probably at least several hundred thousand individuals, the extent of depletion and degree of recovery of populations are uncertain. Commercial whaling is no longer allowed, but illegal hunting may occur at biologically unsustainable levels. Continued threats to

sperm whale populations include vessel strikes, entanglement in fishing gear, competition for resources due to overfishing, pollution, loss of prey and habitat due to climate change, and noise. The species' large population size indicates it is somewhat resilient to current threats.

Status of Species within the Action Area

There are two currently recognized U.S. stocks of sperm whale that occur within the action area, the North Pacific stock and the Hawaii stock. In addition, sperm whales from eastern north and tropical Pacific waters, as well as southern hemisphere waters may be found in the action area. Across the action area, sperm whales are generally found foraging at higher latitudes in the summer, and breeding at lower latitudes during the winter. Given this habitat use, it is likely that all age-sex classes occur within the action area.

In the North Pacific, there are an estimated 26,300 to 32,000 sperm whales in northeast waters and 14,800 to 34,600 sperm whales in tropical waters. The U.S. Hawaii stock is estimated to number 3,354 individuals. There are no reliable estimates for the U.S. North Pacific stock, nor sperm whales in the southern hemisphere, and data are insufficient to examine population trends for all sperm whale populations.

6.2.7.4 Critical Habitat

No critical habitat has been designated for the sperm whale.

6.2.7.5 Recovery Goals

See the 2010 Final Recovery Plan for the sperm whale for complete down listing/delisting criteria for both of the following recovery goals:

1. Achieve sufficient and viable populations in all ocean basins.
2. Ensure significant threats are addressed.

7 ENVIRONMENTAL BASELINE

The "environmental baseline" includes the past and present impacts of all Federal, state, 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 formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 C.F.R. §402.02). In this section, we discuss the environmental baseline within the action area as it applies to species that are likely to be adversely affected by the proposed action.

7.1 Climate Change

There is no question that our climate is changing. The globally-averaged combined land and ocean surface temperature data, as calculated by a linear trend, show a warming of approximately 0.85 degrees Celsius over the period 1880 to 2012 (IPCC 2014). Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade

since 1850 (IPCC 2014). Burning fossil fuels has increased atmospheric carbon dioxide concentrations by 35 percent with respect to pre-industrial levels, with consequent climatic disruptions that include a higher rate of global warming than occurred at the last global-scale state shift (the last glacial-interglacial transition, approximately 12,000 years ago) (Barnosky et al. 2012). Ocean warming dominates the increase in energy stored in the climate system, accounting for more than 90 percent of the energy accumulated between 1971 and 2010 (IPCC 2014). It is virtually certain that the upper ocean (zero to 700 meters) warmed from 1971 to 2010 and it likely warmed between the 1870s and 1971 (IPCC 2014). On a global scale, ocean warming is largest near the surface, and the upper 75 meters warmed by 0.11 degrees Celsius per decade over the period 1971 to 2010 (IPCC 2014). There is high confidence, based on substantial evidence, that observed changes in marine systems are associated with rising water temperatures, as well as related changes in ice cover, salinity, oxygen levels, and circulation. Higher carbon dioxide concentrations have also caused the ocean rapidly to become more acidic, evident as a decrease in pH by 0.05 in the past two decades (Doney 2010).

This climate change is projected to have substantial direct and indirect effects on individuals, populations, species, and the structure and function of marine ecosystems in the near future. It is most likely to have the most pronounced effects on species whose populations are already in tenuous positions (Isaac 2008). As such, we expect the extinction risk of ESA-listed species to rise with global warming. Primary effects of climate change on individual species include habitat loss or alteration, distribution changes, altered and/or reduced distribution and abundance of prey, changes in the abundance of competitors and/or predators, shifts in the timing of seasonal activities of species, and geographic isolation or extirpation of populations that are unable to adapt. Secondary effects include increased stress, disease susceptibility, and predation. Cetaceans with restricted distributions linked to water temperature may be particularly exposed to range restriction (Issac 2009; Learmonth et al. 2006). MacLeod (2009) estimated that, based on expected shifts in water temperature, the ranges of 88 percent of cetaceans would be affected, 47 percent would be negatively affected, and 21 percent would be put at risk of extinction. Blue, fin, humpback, and sperm whales all have a fairly global, cosmopolitan distribution, and so are not predicted to significantly alter their ranges. However, even if these species ranges are not expected to shift, changes in other aspects of their ecology such as the arrival at and departure from feeding grounds and diet may still occur (Ramp et al. 2015). Having an Arctic distribution, North Pacific right whales are expected to be negatively impacted. No prediction is available for sei whales. False killer whales have an oceanic distribution and favor warmer waters, and as such are expected to experience favorable conditions with climate change.

In the Pacific, large-scale periodic oceanographic patterns such as the El Niño Southern Oscillation, the Pacific decadal oscillation, and the North Pacific gyre oscillation can fundamentally change oceanographic conditions leading to changes in productivity and ultimately marine species' distribution and ecology. Marine mammals are no exception with baleen whales showing distribution shifts and changes in diet in accordance with large-scale ocean oscillations (Benson et al. 2002; Fleming et al. 2016). Typical changes from these climatic

patterns include changes in sea surface temperature, precipitation, sea level, and downwelling conditions (Royer and Weingartner 1999; Whitney et al. 1999). The 1982/1983 El Niño and other downwelling events are generally regarded to have reduced food supplies for marine mammals along the U.S. West Coast (Feldkamp et al. 1991; Hayward 2000; Le Boeuf and Crocker 2005). Marine mammal distribution and group size is also believed to have shifted northward in response to persistent prey occurrence in more northerly waters during El Niño events (Benson et al. 2002; Danil and Chivers 2005; Lusseau et al. 2004; Norman et al. 2004; Shane 1994; Shane 1995). Plankton diversity also shifts with El Niño events, as smaller plankton are better able to cope with reduced nutrient availability (Corwith and Wheeler 2002; Sherr et al. 2005). While these large-scale oceanographic patterns occur naturally and are not the consequence of climate change, climate change is predicted to affect these patterns, which may have cascading affects to baleen whales. For example, climate models predict that El Niño will remain the dominant mode of interannual variability into the 21st century (IPCC 2014), which based on historic data, may reduce prey availability for marine mammals on the west coast of the U.S. (Feldkamp et al. 1991; Hayward 2000; Le Boeuf and Crocker 2005).

7.2 Whaling and Subsistence Harvesting

It is not known how many whales were taken by aboriginal hunting and early commercial whaling, though some stocks were already reduced by 1864 (the beginning of the era of modern commercial whaling using harpoon guns as opposed to harpoons simply thrown by men). From 1864 to 1985, at least 2.4 million baleen whales (excluding minke whales) and sperm whales were killed (Gambell 1999). In 1982, the IWC issued a moratorium on commercial whaling beginning in 1985. There is currently no legal commercial whaling by IWC Member Nations party to the moratorium; however, whales are still killed commercially by countries that filed objections to the moratorium (Iceland and Norway). Since the moratorium on commercial whaling in 1985, 706 fin and 388 sperm whales have been documented as killed for commercial purposes (IWC 2017b). Additionally, the Japanese whaling fleet carries out whale hunts under the guise of "scientific research," though very few peer-reviewed papers have been published as a result of the program, and meat from the whales killed under the program is processed and sold at fish markets. Since 1985, 310 fin, 56 sperm, and 1,339 sei whales have been documented as killed for "scientific research" under these IWC special permits (IWC 2017c). Whales are also killed for subsistence purposes; since 1985, an estimated 368 fin, 114 humpback, and three sei whales have been killed for subsistence purposes (IWC 2017a).

7.3 Vessel Strikes

Vessel strikes are considered a serious and widespread threat to ESA-listed whales. This threat is increasing as commercial shipping lanes cross important breeding and feeding habitats and as whale populations recover and populate new areas or areas where they were previously extirpated (Swingle et al. 1993; Wiley et al. 1995). As vessels continue to become faster and more widespread, an increase in vessel interactions with cetaceans is to be expected. The vast majority of commercial vessel strike mortalities of cetaceans are likely undocumented, as most

are likely never reported and most whales killed by vessel strike likely end up sinking rather than washing up on shore. Kraus et al. (2005) estimated that 17 percent of vessel strikes are actually detected. Of 11 cetacean species known to be threatened by vessel strikes, fin whales are the mostly commonly struck species (Laist et al. 2001; Vanderlaan and Taggart 2007). While any vessel has the potential to hit whales, in most cases, lethal or severe injuries are caused by vessel 80 meters or greater, travelling 14 knots or faster (Laist et al. 2001).

Vessel traffic within the action area can come from both private (e.g., commercial, recreational) and federal vessel (e.g., military, research), but traffic that is most likely to result in vessel strikes comes from commercial shipping. A map of the action area, with commercial shipping density data overlaid can be seen in Figure 20 (Halpern et al. 2015).

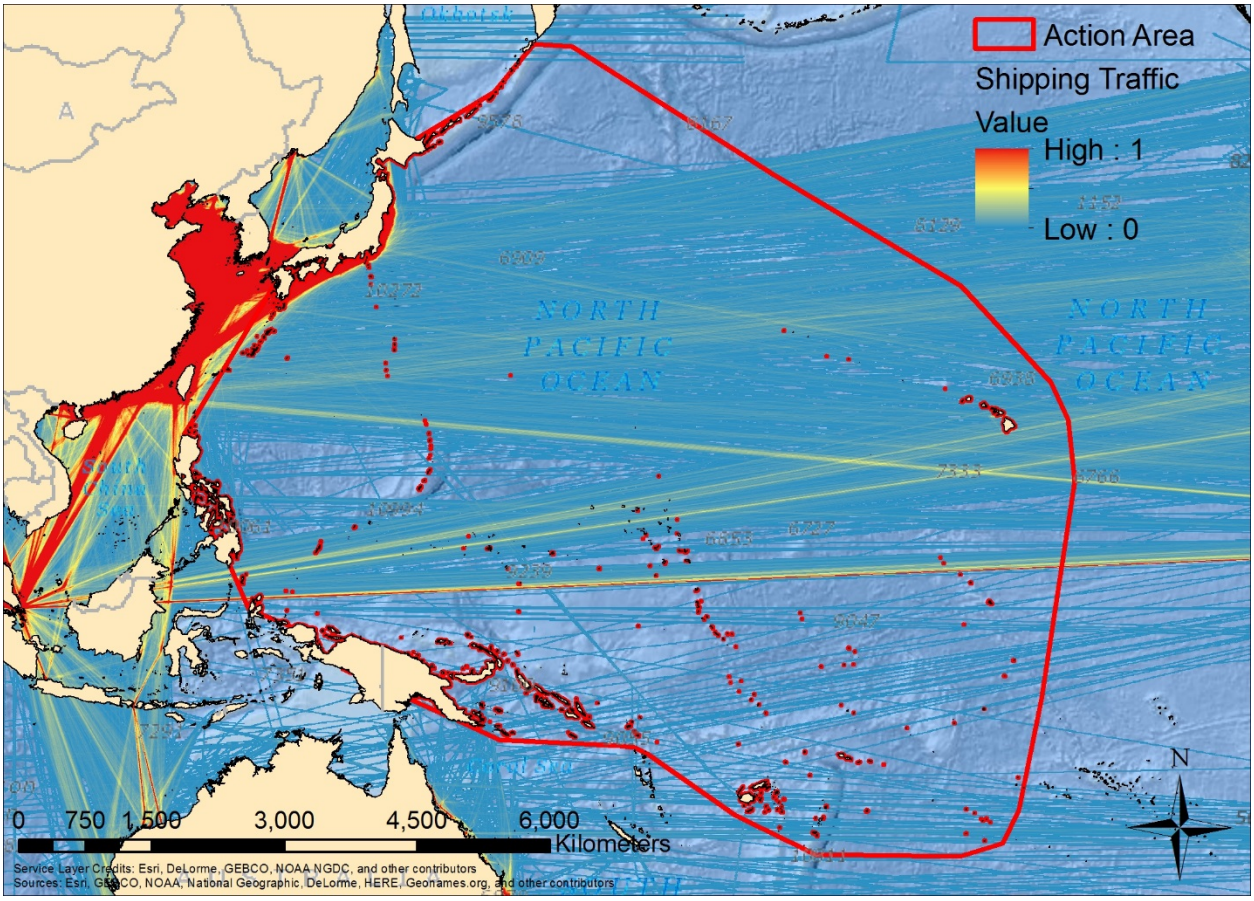

Figure 20: Relative shipping traffic within the action area. Data from (Halpern et al. 2015).

The potential lethal effects of vessel strikes are particularly profound on species with low abundance. However, all large whale species have the potential to be affected by vessel strikes. The latest mortalities and serious injuries related to vessel strikes for the ESA-listed whale stocks within U.S. waters likely to be found in the action area are given in Table 10 below. These data represent only known mortalities and serious injuries; more, undocumented mortalities and serious injuries for these and other stocks found within the action area have likely occurred.

Table 10: Mortalities and serious injuries related to vessel strikes for Endangered Species Act-listed whale stocks within the action area (Carretta et al. 2016; Helker et al. 2016; Muto et al. 2016).

Species	Date Range	Vessel Strikes	Annual Average
Blue whales	2010-2014	3	0.6
False Killer Whales (Main Hawaiian Islands Insular DPS)	2008-2013	0	0
Fin whales	2010-2014	2	0.4
Humpback whales (possible Western North Pacific DPS)	2010-2014	2	0.4
North Pacific right whales	2010-2014	0	0
Sei whales	2007-2011	0	0
Sperm whales	2010-2014	0	0

7.4 Whale Watching

There are numerous whale watching operations within the action area (O'Connor et al. 2009). Whale watching is a rapidly-growing business with more than 3,300 operators worldwide, serving 13 million participants in 119 countries and territories (O'Connor et al. 2009). Although considered by many to be a non-consumptive use of cetaceans with economic, recreational, educational and scientific benefits, whale watching has the potential impact whales in a variety of whales (reviewed in Parsons 2012). In some cases, whale watching vessels have a high frequency of collision with whales (Parsons 2012). Whale watching vessels can also contribute to underwater noise that may affect whales (Parsons 2012). Harassment from whale watching vessels has been known to cause whales to alter surfacing, acoustic, and swimming behavior and can lead to changes in direction, group size, and coordination (Parsons 2012). In addition, preferred habitats may be abandoned if disturbance levels are too high (Parsons 2012). The particular response observed appears to be dependent on factors such as vessel proximity, speed, and direction, as well as the number of vessels in the vicinity. While numerous short-term behavioral responses to whale watching vessels are well documented, much less is known about long-term negative effects. However, in a recent study of humpback whales off the coast of New England, Weinrich and Corbelli (2009) found no detectable impacts on calf production or survival. Nonetheless, as longitudinal research on these species continues, we will soon have a better understanding of the population-level, long-term impacts of whale watching (New et al. 2015).

7.5 Sound

Cetaceans generate and rely on sound to navigate, hunt, and communicate with other individuals and anthropogenic sound can interfere with these important activities (Nowacek et al. 2007). Anthropogenic sound in the action area may be generated by commercial and recreational vessels, sonar, aircraft, military activity (discussed in Section 7.6), seismic exploration, in-water construction activities, wind farms, and other human activities. These activities occur to varying degrees throughout the year and may lead to behavioral disturbance or even physical damage, both of which have the potential to negatively impact fitness. Behavioral disturbances may include changes in surfacing, diving, orientation, and vocalizations (Gomez et al. 2016; Nowacek et al. 2007). Physiological responses can include stress related changes such as increases in heart

rate, respiratory rates, stress hormones, and temporary or permanent hearing threshold shifts (Kunc et al. 2016; Nowacek et al. 2007).

Commercial shipping traffic is a major source of low frequency anthropogenic sound in the action area (NRC 2003) (Section 7.3). Large vessels emit predominantly low frequency sound which overlaps with many mysticetes predicted hearing ranges [7 hertz to 35 kilohertz, (NOAA 2016)] and may mask their vocalizations and cause stress (Rolland et al. 2012). Studies also report broadband sound from large cargo ships above two kilohertz that may interfere with important biological functions of odontocetes, including foraging (Blair et al. 2016; Holt 2008). Other commercial vessels (e.g., whale watching, fisheries, etc.) and recreational vessels also operate within the action area and may produce similar sounds, although to a lesser extent given their much smaller size. Nonetheless, even sound from small whale watching vessels can cause auditory masking, behavioral responses, and temporary threshold shifts in cetaceans (Nowacek et al. 2007). Anthropogenic sound from vessel traffic may be particularly prevalent in shallower waters (13 to 19 meters). At greater foraging depths of 100 to 200 meters (Croll et al. 2001; Goldbogen et al. 2011), less but still substantial vessel traffic sound can be heard. Anthropogenic noise from vessel traffic within the action area can be seen in Figure 21 below.

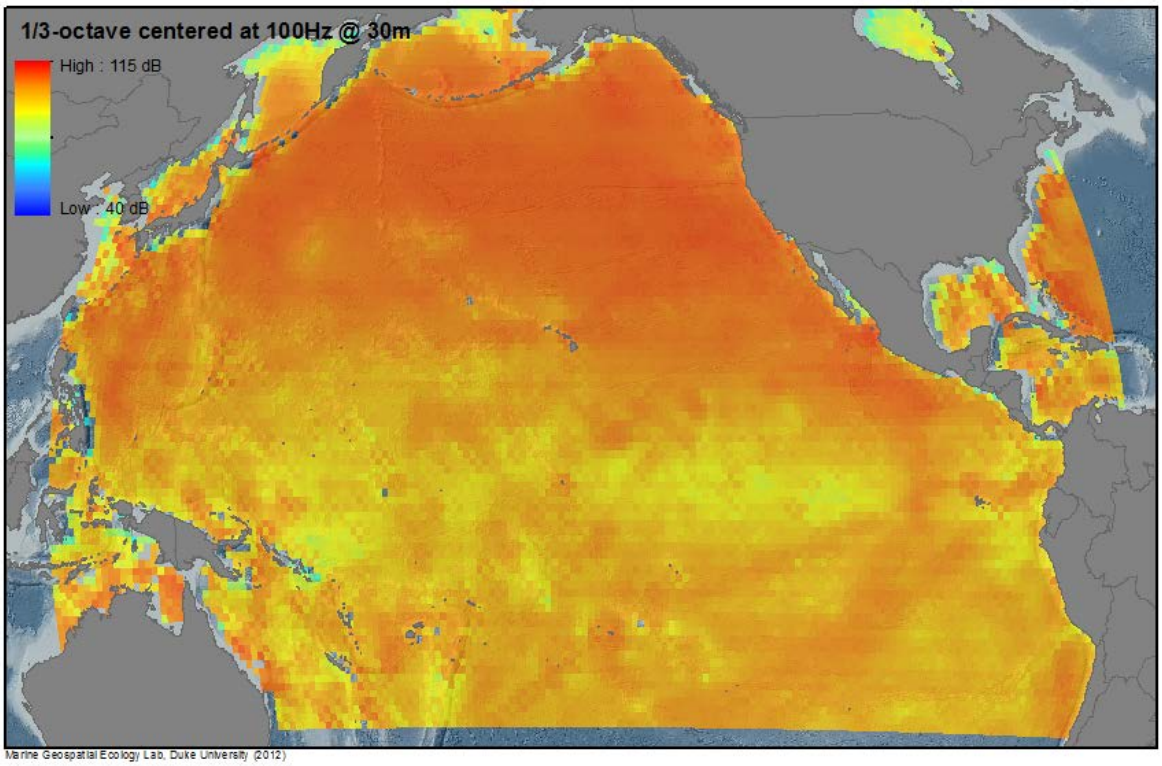

Figure 21: Vessel traffic sound in decibels, 1/3-octave centered at 100 hertz at 30 meters, within Pacific. Data from http://cetsound.noaa.gov/

Sonar systems are used on recreational, commercial, and military vessels and may also affect cetaceans (NRC 2003). Although little information is available on potential effects of multiple

commercial and recreational sonars to cetaceans, the distribution of these sounds would be small because of their short durations and the fact that the high frequencies of the signals attenuate quickly in seawater (Nowacek et al. 2007). However, military sonar, particularly low frequency active sonar, often produces intense sounds at high source levels, and these may impact cetacean behavior (Southall et al. 2016).

Aircraft within the action area may consist of small commercial or recreation airplanes or helicopters, to large commercial airliners. These aircraft produce a variety of sounds that could potentially enter the water and impact cetaceans. While it is difficult to assess these impacts, several studies have documented what appear to be minor behavioral disturbances in response to aircraft presence (Nowacek et al. 2007).

There are also some, although relatively few, oil and gas activities within the action area, the operations of which may produce noise that could impact ESA-listed cetaceans within the action area (Figure 22). In addition, scientific research and/or geological and geophysical seismic surveys involving airguns may occur within the action area. These airguns generate intense low-frequency sound pressure waves capable of penetrating the seafloor and are fired repetitively at intervals of 10 to 20 seconds for extended periods (NRC 2003). Most of the energy from the guns is directed vertically downward, but significant sound emission also extends horizontally. Peak sound pressure levels from airguns usually reach 235 to 240 decibels at dominant frequencies of five to 300 hertz (NRC 2003). Most of the sound energy is at frequencies below 500 hertz, which is within the hearing range of baleen whales (Nowacek et al. 2007). In the United States, seismic surveys involving the use of airguns with the potential to take marine mammals are covered by incidental harassment authorizations under the MMPA, and if they involve ESA-listed species, undergo formal ESA section 7 consultation.

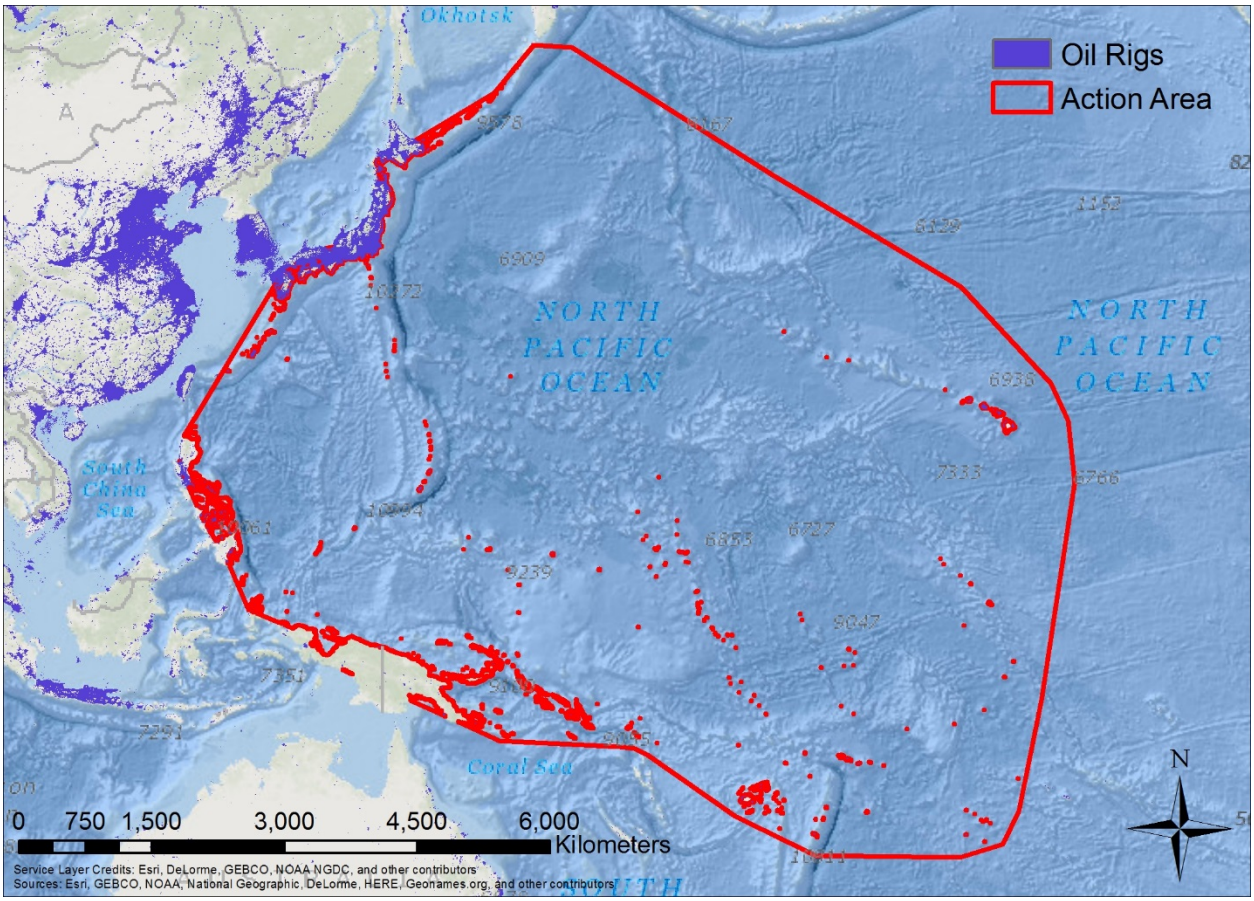

Figure 22: Oil rigs in and near the action area. Data from (Halpern et al. 2015).

Marine construction in the action area that produces sound includes drilling, dredging, pile driving, cable laying, and explosions. These activities are known to cause behavioral disturbance and physical damage (NRC 2003). While most of these activities are coastal, offshore construction does occur.

7.6 Military Activities

The U.S. Navy conducts military readiness activities within two range complexes within the action area (Figure 23). These activities can be categorized as either training or testing exercises. During training, existing and established weapon systems and tactics are used in realistic situations to simulate and prepare for combat. Activities include: routine gunnery, missile, surface fire support, amphibious assault and landing, bombing, sinking, torpedo, tracking, and mine exercises. Testing activities are conducted for different purposes and include at-sea research, development, evaluation, and experimentation. The U.S. Navy performs testing activities to ensure that its military forces have the latest technologies and techniques available to them. In addition to these testing and training activities, the Navy operates Surveillance Towed Array Sensor System Low Frequency Active sonar (SURTASS LFA) within the action area. SURTASS LFA utilizes low frequency sounds to detect and monitor submarines.

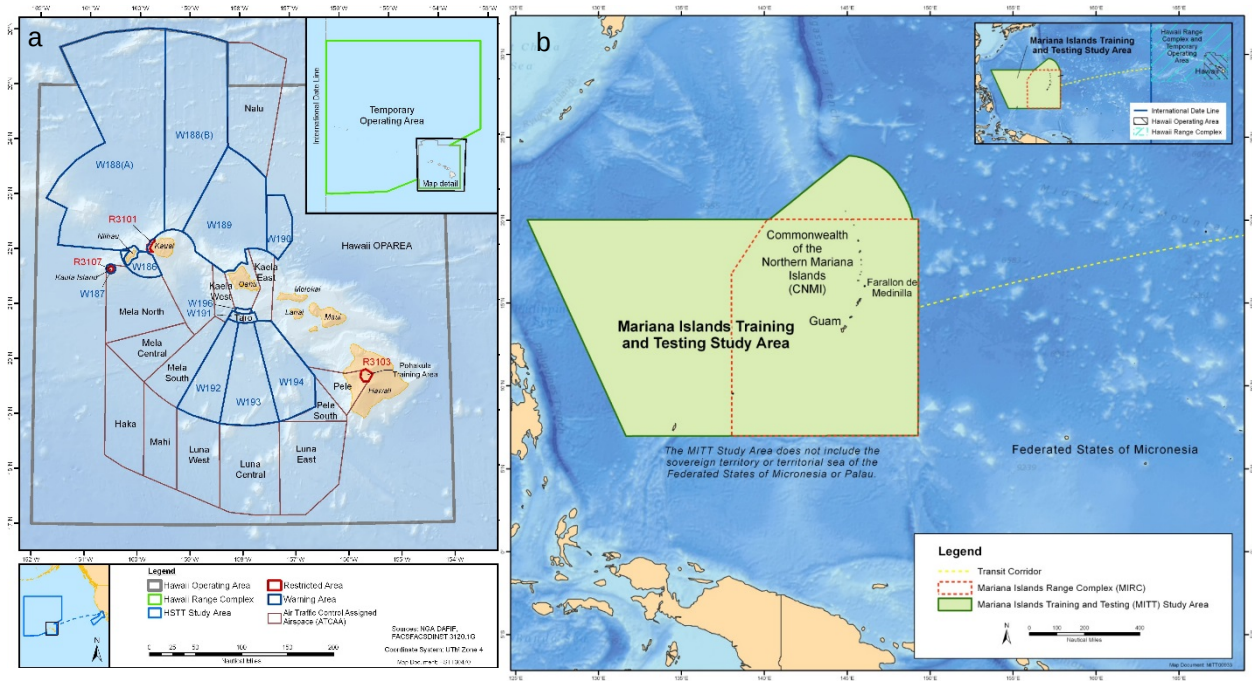

Figure 23: Map showing location of the a) Navy's Hawaii and b) Mariana Island's Training and Testing Study areas.

U.S. Navy activities are likely to produce sound and visual disturbance to cetaceans and may result in vessel strikes (NMFS 2015b; NMFS 2015c; NMFS 2016b). Take of ESA-listed cetaceans considered in this opinion for these Navy activities that has been authorized and previously consulted on within the action area can be seen in Table 11. Due to the nature of the Navy's activities, the take in Table 11 includes take for the Southern California Range Complex. In addition, humpback whale takes in Table 10 consist of takes of primarily non-ESA listed humpbacks, given the recent status change and DPS listing of humpbacks. Thus, the overall take authorized as the result of Navy activities within the action area is less than that in Table 11. Takes are listed according to the level of harassment as defined by the MMPA. For military readiness activities, Level B harassment under the MMPA is defined as: "any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered", and Level A harassment is defined as: "any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild" (16 U.S.C. 1361 et seq.). Even though our previous biological opinions considering the effects of Navy activities within the action area resulted in incidental take statements, we concluded that the Navy's actions were not likely to jeopardize the continued existence of ESA-listed species, nor adversely modify designated critical habitat.

Table 11: Authorized annual take for United States Navy activities within the action area.

Species	Level B Harassment	Level A Harassment
Blue whales	4,797	Up to three ESA-listed whales during the five-year period of the MMPA rule not to exceed one of each species
Fin whales	2,079	
Humpback whales	11,244	
Sperm whales	4,493	
Sei whales	1,136	
North Pacific right whales	7	0
False Killer Whales (Main Hawaiian Islands Insular DPS)	56	0

7.7 Fisheries

Entrapment and entanglement in fishing gear is a frequently documented source of human-caused mortality in cetaceans (see Dietrich et al. 2007). Materials entangled tightly around a body part may cut into tissues, enable infection, and severely compromise an individual's health (Derraik 2002). Entanglements also make animals more vulnerable to additional threats (e.g., predation and vessel strikes) by restricting agility and swimming speed. The majority of cetaceans that die from entanglement in fishing gear likely sink at sea rather than strand ashore, making it difficult to accurately determine the extent of such mortalities. Cetaceans are also known to ingest fishing gear, likely mistaking it for prey, which can lead to fitness consequences and mortality. Necropsies of stranded whales have found that ingestion of net pieces, ropes, and other fishing debris has resulted in gastric impaction and ultimately death (Jacobsen et al. 2010).

As with vessel strikes, entanglement or entrapment in fishing gear likely has the greatest impact on populations of ESA-listed species with the lowest abundance (e.g., Kraus et al. 2016). Nevertheless, all species of cetacean may face threats from derelict fishing gear. The latest mortalities and serious injuries related to fishing gear entanglement for the ESA-listed cetacean stocks within U.S. waters likely to be found in the action area are given in

Table 12 below. These data represent only known mortalities and serious injuries; more, undocumented mortalities and serious injuries for these and other stocks found within the action area have likely occurred.

Table 12: Mortalities and serious injuries related to fisheries interactions for Endangered Species Act-listed marine mammal stocks within the action area (Carretta et al. 2016; Helker et al. 2016; Muto et al. 2016).

Species	Date Range	Entanglements	Annual Average
Blue whales	2010-2014	0	0
False Killer Whales (Main Hawaiian Islands Insular DPS)	2008-2013	NA[4]	0.15
Fin whales	2010-2014	1	0.2
Humpback whales (possible Western North Pacific DPS)	2010-2014	7	1.4
North Pacific right whales	2010-2014	0	0
Sei whales	2007-2011	1	0.2
Sperm whales	2010-2014	6	1.2

[4] Due to the nature of false killer whale stock structure and the methods used to estimate mortality and serious injury from fisheries interactions, precise numbers of entanglements are not available.

In addition to these direct impacts, cetaceans may also be subject to indirect impacts from fisheries. Many cetacean species (particularly fin and humpback whales) are known to feed on species of fish that are harvested by humans (Carretta et al. 2016). Thus, competition with humans for prey is a potential concern. Reductions in fish populations, whether natural or human-caused, may affect the survival and recovery of ESA-listed populations. Even species that do not directly compete with human fisheries could be indirectly affected by fishing activities through changes in ecosystem dynamics. However, in general the effects of fisheries on whales through changes in prey abundance remain unknown.

7.8 Pollution

Contaminants cause adverse health effects in cetaceans. Contaminants may be introduced by rivers, coastal runoff, wind, ocean dumping, dumping of raw sewage by boats and various industrial activities, including offshore oil and gas or mineral exploitation (Garrett 2004; Grant and Ross 2002; Hartwell 2004). The accumulation of persistent organic pollutants, including polychlorinated-biphenyls, dibenzo-p-dioxins, dibenzofurans and related compounds, through trophic transfer may cause mortality and sub-lethal effects in long-lived higher trophic level animals such as cetaceans (Waring et al. 2016), including immune system abnormalities, endocrine disruption, and reproductive effects (Krahn et al. 2007). Persistent organic pollutants may also facilitate disease emergence and lead to the creation of susceptible “reservoirs” for new pathogens in contaminated marine mammal populations (Ross 2002). Recent efforts have led to improvements in regional water quality and monitored pesticide levels have declined, although the more persistent chemicals are still detected and are expected to endure for years (Law 2014).

Exposure to hydrocarbons released into the environment via oil spills and other discharges pose risks to marine species. Cetaceans are generally able to metabolize and excrete limited amounts of hydrocarbons, but exposure to large amounts of hydrocarbons and chronic exposure over time pose greater risks (Grant and Ross 2002). Cetaceans have a thickened epidermis that greatly reduces the likelihood of petroleum toxicity from skin contact with oils (Geraci 1990), but they may inhale these compounds at the water’s surface and ingest them while feeding (Matkin and Saulitis 1997). Hydrocarbons also have the potential to impact prey populations, and therefore may affect ESA-listed species indirectly by reducing food availability.

Cetaceans are also impacted by marine debris, which includes: plastics, glass, metal, polystyrene foam, rubber, and derelict fishing gear (Baulch and Perry 2014; Li et al. 2016). Marine debris is introduced into the marine environment through ocean dumping, littering, or hydrologic transport of these materials from land-based sources. Even natural phenomena, such as tsunamis and continental flooding, can cause large amounts of debris to enter the ocean environment. Small cetaceans often become entangled in marine debris, including fishing gear (Baird et al. 2015). The ingestion of marine debris has been documented to result in blockage or obstruction of the digestive tract, mouth, and stomach lining of various species and can lead to serious internal injury or mortality (Derraik 2002). In addition to interference with alimentary processes,

plastics lodged in the alimentary tract could facilitate the transfer of pollutants into the bodies of whales and dolphins (Derraik 2002).

Aquatic nuisance species are aquatic and terrestrial organisms, introduced into new habitats throughout the United States and other areas of the world, that produce harmful impacts on aquatic ecosystems and native species (http://www.anstaskforce.gov). They are also referred to as invasive, alien, or nonindigenous species. Introduction of these species is cited as a major threat to biodiversity, second only to habitat loss (Wilcove et al. 1998). They have been implicated in the endangerment of 48 percent of ESA-listed species (Czech and Krausman 1997).

7.9 Scientific Research

Scientific research similar to that which would be conducted under Permit No. 20311 has and will continue to impact ESA-listed cetaceans within the action are. Currently, there are nine active research permits that may affect the ESA-listed cetaceans considered in this opinion (Permit Nos. 14809, 15240, 15330, 16239, 17312, 17845, 19091, 19225, and 19257). The primary objective of these studies is generally to monitor populations or gather data for behavioral and ecological studies. These activities may directly or incidentally result in harassment, stress, and injury. No mortalities are authorized for any animal of any age and no mortalities have been reported from the permits currently active in the action area. It is important to note that the research activities that would be conducted under Permit No. 20311 would be in addition to those conducted under these other research permits. Many individuals would be subject to more than one activity within in a given year, and in some cases could be subject to the same activity multiple times within a single year. All of these permits have undergone ESA section 7 consultation and for each permit, we concluded that the permits and research was not likely to jeopardize the continued existence of ESA-listed species, nor adversely modify designated critical habitat.

Nine research permits represents limited research effort relative to the size of the action area and the species abundance in the action area. Nonetheless, research is typically concentrated around easily accessible areas. As such, repeated disturbances of individuals may within a year. However, all permits contain conditions requiring the permit holders to coordinate their activities with the NMFS' regional offices and other permit holders and, to the extent possible, share data to avoid unnecessary duplication of research. In addition, many values represent permitted research activities occurring over the entire range of the species or in areas extending further than the limits of the action area considered in this opinion. Nevertheless, these numbers represent a worst-case scenario in the action area.

As detailed further below in our response analysis, whales may respond to these research activities in a variety of ways including no obvious response, minor behavioral disturbances, avoidance and stress related response, temporarily abandoning important behaviors such as feeding and breeding, and in rare cases whales may become injured, infected, and possibly even die when biological samples are taken or implantable tags are used (NMFS 2016a; NMFS 2017a). The fact that multiple permitted "takes" of ESA-listed cetaceans is already permitted in

the action area and is expected to continue to be permitted in the future means that research has the ability to contribute to or even exacerbate the stress response to cetaceans generated from other threats occurring in the action area.

8 EFFECTS OF THE ACTION

Section 7 regulations define "effects of the action" as the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 C.F.R. §402.02). Indirect effects are those that are caused by the proposed action and are later in time, but are reasonably certain to occur. This effects analyses section is organized following the stressor, exposure, response, risk assessment framework.

The jeopardy analysis relies upon the regulatory definition of "to jeopardize the continued existence of a listed species," which is "to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 C.F.R. §402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

In this section, we describe the potential stressors associated with the proposed action, the probability of individuals of ESA-listed species being exposed to these stressors based on the best scientific and commercial evidence available, and the probable responses of those individuals (given probable exposures) based on the available evidence. As described in Section 2, for any responses that would be expected to reduce an individual's fitness (i.e., growth, survival, annual reproductive success, or lifetime reproductive success), the assessment would consider the risk posed to the viability of the population(s) those individuals comprise and to the ESA-listed species those populations represent. For this consultation, we are particularly concerned about behavioral and stress-based physiological disruptions and potential unintentional mortality that may result in animals that fail to feed, reproduce, or survive because these responses are likely to have population-level consequences. The purpose of this assessment and, ultimately, of this consultation is to determine if it is reasonable to expect the proposed action to have effects on ESA-listed species that could appreciably reduce their likelihood of surviving and recovering in the wild.

8.1 Stressors Associated with the Proposed Action

Stressors are any physical, chemical, or biological entity that may induce an adverse response either in an ESA-listed species or their designated critical habitat. The issuance of Permit No. 20311 would authorize several research activities that may expose ESA-listed cetaceans within the action area to a variety of stressors. Each research activity presents a unique set of stressors, as further detailed below. Given the directed nature of the proposed research, the research activities directed only at non-ESA listed cetaceans that would be authorized under Permit No.

20311 are not expected to present any stressors to the ESA-listed cetaceans found in the action area, and so these activities are not considered further.

Manned aerial surveys would expose cetaceans to aircraft noise and visual disturbance depending on the aircraft altitude. Unmanned aerial surveys present similar stressors, although given their much smaller size and quieter engines, the magnitude of these stressors is expected to be much smaller. Vessel surveys and close approaches would present a range of stressors including vessel traffic, discharge, and visual and auditory disturbances. Fecal sampling, sloughed skin sampling, and most documentation (except underwater documentation with divers) are not expected to produce any stressors aside from those associated with vessel surveys and close approaches. Underwater documentation with divers has the potential to cause disturbance as divers attempt to approach and photography/video whales. Biopsy sampling carries the stressor of a closer vessel approach than is typical for other vessel survey activities (except tagging), a minor puncture wound, and tissue collection. Tagging presents the additional stressors of a very close approach to apply tags, direct physical contact in the case of suction-cup tags or puncture wounds in the case of dart/barb tags.

8.2 Mitigation to Minimize or Avoid Exposure

Several aspects of the proposed action are designed to minimize ESA-listed species' exposure to the potential stressors associated with the research activities. These include the experience and measures taken by PIFSC researchers and conditions specified in the permit, as proposed by the Permits Division.

The Principal (Erin Olsen, PhD) and the Co-Investigators that would conduct research under Permit No. 20311 all have extensive experience conducting research on cetaceans within the action area using the methods described here (NMFS 2017b). Many of these individuals have been investigators on previous PIFSC researcher permits and have extensive experience conducting research on cetaceans. As noted in Section 1.1, all previous PIFSC and SWFSC permits underwent section 7 consultation and resulted in biological opinions concluding that the research was not likely to jeopardize the continued existence of ESA-listed species, nor destroy or adversely modify designated critical habitat. In addition, in their permit application PIFSC outlines the following mitigation measures designed to minimize exposure to ESA-listed species:

> "We attempt to minimize and shorten disturbance by utilizing boating skills of our adept vessel drivers, whose objective is to approach the animals without causing a change in their natural behavior. Small boat approaches are conducted in a manner that minimizes boat noise, does not involve any sudden changes in speed or course, and approaches an animal from behind while not greatly exceeding the animal's travel speed. Time spent in the vicinity of target animals, as well as the number of attempts made to collect photographs, to collect biological samples or to deploy tags are limited in order to minimize any incidental harassment or disturbance from the presence of the small boat or the activities themselves. Animals exhibiting aerial behaviors or tail slaps will not be approached. When possible, tagged individuals will be photographed in order to examine

modes of tag failure, monitor wound healing, and/or monitor the individual's life history patterns through photo-identification.

We also attempt to minimize disturbance by utilizing only authorized Co-Investigators that have been properly trained for the research method used (i.e., in-water observations, biopsy sampling, tagging activities, UAS surveys). Underwater assessment and documentation will be conducted by our Co-Investigators that are proficient in the use of mask and snorkel, experienced with the in-water effort and mission, and knowledgeable with the underwater cameras and whales' behaviors (specifically recognizing behaviors that may be adverse or evasive in nature). In-water effort will focus primarily on stationary individuals or stationary groups of whales (i.e., singer, breath-holders). The underwater approach will be slow and methodical; this approach has been successful, such that individuals typically maintain their position and behavior throughout the approach. If the whale(s) moves away from our underwater personnel, then we will abort further efforts. Biopsy sampling will be conducted by our Co-Investigators that have many years of experience using biopsy equipment and conducting biopsy sampling around wild cetaceans. Co-Investigators will not be added to the permit unless they have been properly trained in biopsy sampling, which includes review of safety information for handling biopsy gear, on-land target practice, and on-water practice under the supervision of a Co-Investigator on this permit or someone of known experience conducting research elsewhere. Tagging activities will be conducted by Co-Investigators authorized and trained in tagging activities. Training for tagging activities include observation of tag attachment techniques in the field, practice handling and maneuvering the pole or pneumatic rifle, and supervised tagging attempts. Unmanned aerial surveys will be controlled by a licensed UAS pilot that has received UAS flight training and approved by NOAA's Office of Marine and Aviation Operations prior to UAS activities.

Potential disturbance from aerial surveys is minimized by flying at a constant speed and altitude. Aerial photographic passes are limited in number to reduce the potential for harassment of individual animals. In this permit, we are requesting the use of aerial surveys using UAS platforms to help further minimize potential disturbance from manned aerial surveys. UAS technology is still early in its development and will continue to improve over time, but have already proven to be less disruptive to wildlife than traditional manned aerial surveys simply because it is drastically smaller in size and quieter."

In addition to these mitigation measures taken by PIFSC, the Permits Division proposed to include the following terms and conditions, which include several mitigation measures:

III. Terms and Conditions

The activities authorized herein must occur by the means, in the areas, and for the purposes set forth in the permit application, and as limited by the Terms and Conditions specified in this

permit, including attachments and appendices. Permit noncompliance constitutes a violation and is grounds for permit modification, suspension, or revocation, and for enforcement action.

A. Duration of Permit

1. Personnel listed in Condition C.1 of this permit (hereinafter "Researchers") may conduct activities authorized by this permit through June 30, 2022. This permit expires on the date indicated and is non-renewable. This permit may be extended by the Director, NMFS Office of Protected Resources, pursuant to applicable regulations and the requirements of the MMPA and ESA.

2. Researchers must immediately stop permitted activities and the Permit Holder must contact the Chief, NMFS Permits and Conservation Division (hereinafter "Permits Division") for written permission to resume

   a. If serious injury or mortality[5] of protected species occurs.

   b. If authorized take[6] is exceeded in any of the following ways:

      i. More animals are taken than allowed in Table 1 of Appendix 1.

      ii. Animals are taken in a manner not authorized by this permit.

      iii. Protected species other than those authorized by this permit are taken.

   c. Following incident reporting requirements at Condition E.2.

3. The Permit Holder may continue to possess biological samples[7] acquired[8] under this permit after permit expiration without additional written authorization, provided the samples are maintained as specified in this permit.

B. Number and Kind(s) of Protected Species, Location(s) and Manner of Taking

[5] This permit does not allow for unintentional serious injury and mortality caused by the presence or actions of researchers. This includes, but is not limited to: deaths of dependent young by starvation following research-related death of a lactating female and deaths resulting from infections related to sampling procedures or invasive tagging; Note that for marine mammals, a serious injury is defined by regulation as any injury that will likely result in mortality.

[6] By regulation, a take under the MMPA means to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill any marine mammal. This includes, without limitation, any of the following: The collection of dead animals, or parts thereof; the restraint or detention of a marine mammal, no matter how temporary; tagging a marine mammal; 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 marine mammal; and feeding or attempting to feed a marine mammal in the wild. Under the ESA, a take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to do any of the preceding.

[7] Biological samples include, but are not limited to: carcasses (whole or parts); and any tissues, fluids, or other specimens from live or dead protected species; except feces, urine, and spew collected from the water or ground.

[8] Authorized methods of sample acquisition are specified in Appendix 1.

1. The table in Appendix 1 outlines the number of protected species, by species and stock, authorized to be taken, and the locations, manner, and time period in which they may be taken.

2. Researchers working under this permit may collect visual images (e.g., photographs, video) in addition to the photo-identification or behavioral photo-documentation authorized in Appendix 1 as needed to document the permitted activities, provided the collection of such images does not result in takes.

3. The Permit Holder may use visual images and audio recordings collected under this permit, including those authorized in Table 1 of Appendix 1, in printed materials (including commercial or scientific publications) and presentations provided the images and recordings are accompanied by a statement indicating that the activity was conducted pursuant to NMFS ESA/MMPA Permit No. 20311. This statement must accompany the images and recordings in all subsequent uses or sales.

4. The Chief, Permits Division may grant written approval for personnel performing activities not essential to achieving the research objectives (e.g., a documentary film crew) to be present, provided

    a. The Permit Holder submits a request to the Permits Division specifying the purpose and nature of the activity, location, approximate dates, and number and roles of individuals for which permission is sought.

    b. Non-essential personnel/activities will not influence the conduct of permitted activities or result in takes of protected species.

    c. Persons authorized to accompany the Researchers for the purpose of such non-essential activities will not be allowed to participate in the permitted activities.

    d. The Permit Holder and Researchers do not require compensation from the individuals in return for allowing them to accompany Researchers.

5. Researchers must comply with the following conditions related to the manner of taking:

<u>Counting and Reporting Takes</u>

    a. Count and report a take of a cetacean regardless of whether you observe a behavioral response to the permitted activity.

b. Count and report 1 take per cetacean per day including all approaches[9] in water and attempts to remotely biopsy and tag.

c. During manned aerial surveys flown at an altitude lower than 1,000 feet, count and report 1 take per cetacean observed per day, regardless of the number of passes.

d. During UAS surveys, count 1 take per cetacean approached per day, regardless of the number of passes.

General

e. Researchers must approach animals cautiously and retreat if behaviors indicate the approach may be interfering with reproduction, feeding, or other vital functions.

f. Where females with calves are authorized to be taken, Researchers:

i. Must immediately terminate efforts if there is any evidence that the activity may be interfering with pair-bonding or other vital functions;

ii. Must not position the research vessel between the mother and calf;

iii. Must approach mothers and calves gradually to minimize or avoid any startle response;

iv. Must discontinue an approach if a calf is actively nursing; and

v. Must, if possible, sample the calf first to minimize the mother's reaction when sampling mother/calf pairs.

For underwater filming/photography:

g. No more than 2 divers may be in the water at one time during research. An underwater approach/activity must be terminated if a cetacean exhibits adverse/evasive changes in behavior. Use of an additional diver requires approval by the NMFS Permits Division.

h. Research Assistants may conduct underwater activities only if they are trained photographers, videographers, or safety divers.

For research on humpbacks in Hawaii:

i. Vessels engaged in research activities must fly a clearly visible triangular

[9] An "approach" is defined as a continuous sequence of maneuvers involving a vessel, equipment, or researcher's body, including drifting, directed toward a cetacean or group of cetaceans closer than 100 yards for baleen and sperm whales and 50 yards for all other cetaceans.

pennant at all times. The pennant must be yellow with minimum dimensions of 18"H x 26"L and with the permit number displayed in 6" high black numerals.

Aerial Survey

j. Aerial flights must not be conducted over pinnipeds on land.

Manned Aerial Surveys

k. Manned aerial surveys must be flown at an altitude of 700 feet. Descents for photo identification and behavioral observations must be no lower than 500 feet.

UAS

l. Researchers are authorized to use a fixed wing and vertical take-off and landing (VTOL) UAS.

m. UAS must be flown at an altitude no lower than 75 feet for VTOL and no lower than 200 feet for fixed wing systems.

Remote Biopsy and Tagging

n. Researchers may attempt (deploy or discharge/fire) each procedure (biopsy and tag) on an animal 3 times a day.

o. A biopsy or tag attachment attempt must be discontinued if an animal exhibits repetitive, strong, adverse reactions to the activity or vessel.

p. Researchers may biopsy sample and tag calves, depending on their age and species. See Appendix 1 for details.

q. Before attempting to biopsy/tag/sample an individual, Researchers must take reasonable measures (e.g., compare photo-identifications) to avoid repeated sampling of any individual.

r. Researchers must not attempt to biopsy or tag a cetacean anywhere forward of the pectoral fin.

s. Researchers must use sterile[10] biopsy tips and tag dart/barbs.

i. If the biopsy tip or tag anchors becomes contaminated and is no longer sterile (e.g., missed attempt, contacts seawater, physical contact) prior to use, a new sterile biopsy tip or tag anchors must be used.

[10] Sterilization = destroys or eliminates all forms of microbial life and is carried out by physical or chemical methods (CDC 2008). These methods should follow the IACUC-approved protocol for sterilization (e.g., gas).

ii. If a new, sterile biopsy tip is not available, the contaminated tip must be completely cleaned and disinfected[11] following the protocol described in the application (including a 20 minute soak in 10 percent sodium hypochlorite (bleach) bath or 40 minutes in a cetylcide bath).

iii. If new sterile tag anchors are not available, the researcher should cease tagging efforts until sterile alternatives are available.

Non-target Species

t. To minimize disturbance of Hawaiian monk seals:

i. Do not enter the water when monk seals are present, and if approached by a seal, leave the area.

ii. Report any opportunistic monk seal sightings to the NMFS Pacific Islands Fisheries Science Center, Hawaiian Monk Seal Research Program, NOAA IRC, 1845 WASP Blvd, Building 176, Honolulu, HI 96818.

iii. In the main Hawaiian Islands: Tracy Mercer; Tracy.Mercer@noaa.gov; phone (808)725-5718; fax (808)725-5567.

iv. In the Northwestern Hawaiian Islands: Thea Johanos; Thea.Johanos-Kam@noaa.gov; phone (808)725-5709; fax (808)725-5567.

6. The Permit Holder must comply with the following conditions and the regulations at 50 CFR 216.37, for biological samples acquired or possessed under authority of this permit.

a. The Permit Holder is ultimately responsible for compliance with this permit and applicable regulations related to the samples unless the samples are permanently transferred according to NMFS regulations governing the taking and importing of marine mammals (50 CFR 216.37) and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR 222.308).

b. Samples must be maintained according to accepted curatorial standards and must be labeled with a unique identifier (e.g., alphanumeric code) that is connected to on-site records with information identifying the

i. species and, where known, age and sex;

ii. date of collection, acquisition, or import;

[11] Disinfection= eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects usually by liquid chemicals (CDC 2008).

iii. type of sample (e.g., skin, blubber);

iv. origin (i.e., where collected or imported from); and

v. legal authorization for original sample collection or import.

c. Biological samples belong to the Permit Holder and may be temporarily transferred to Authorized Recipients identified in Appendix 2 without additional written authorization, for analysis or curation related to the objectives of this permit. The Permit Holder remains responsible for the samples, including any reporting requirements.

d. The Permit Holder may request approval of additional Authorized Recipients for analysis and curation of samples related to the permit objectives by submitting a written request to the Permits Division specifying the

i. name and affiliation of the recipient;

ii. address of the recipient;

iii. types of samples to be sent (species, tissue type); and

iv. type of analysis or whether samples will be curated.

e. The Permit Holder may grant written approval to additional Authorized Recipients for analysis and curation of samples related to the permit objectives. The Permit Holder must maintain a record of the transfer including:

i. name and affiliation of the recipient;

ii. address of the recipient;

iii. types of samples sent (species, tissue type); and

iv. type of analysis or whether samples will be curated.

f. Sample recipients must have authorization pursuant to 50 CFR 216.37 prior to permanent transfer of samples and transfers for purposes not related to the objectives of this permit.

g. Samples cannot be bought or sold, including parts transferred pursuant to 50 CFR 216.37.

h. After meeting the permitted objectives, the Permit Holder may continue to possess and use samples acquired under this permit, without additional written authorization, provided the samples are maintained as specified in the permit and findings are discussed in the annual reports (See Condition E. 3).

C. Qualifications, Responsibilities, and Designation of Personnel

1. At the discretion of the Permit Holder, the following Researchers may participate in the conduct of the permitted activities in accordance with their qualifications and the limitations specified herein:

   a. Principal Investigator – Erin Oleson.

   b. Co-Investigator(s) – See Appendix 2 for list of names and corresponding activities.

   c. Research Assistants – personnel identified by the Permit Holder or Principal Investigator and qualified to act pursuant to Conditions C.2, C.3, and C.4 of this permit.

2. Individuals conducting permitted activities must possess qualifications commensurate with their roles and responsibilities. The roles and responsibilities of personnel operating under this permit are as follows:

   a. The Permit Holder is ultimately responsible for activities of individuals operating under the authority of this permit. Where the Permit Holder is an institution/facility, the Responsible Party is the person at the institution/facility who is responsible for the supervision of the Principal Investigator.

   b. The Principal Investigator (PI) is the individual primarily responsible for the taking, import, export and related activities conducted under the permit. This includes coordination of field activities of all personnel working under the permit. The PI must be on site during activities conducted under this permit unless a Co-Investigator named in Condition C.1 is present to act in place of the PI.

   c. Co-Investigators (CIs) are individuals who are qualified to conduct activities authorized by the permit, for the objectives described in the application, without the on-site supervision of the PI. CIs assume the role and responsibility of the PI in the PI's absence.

   d. Research Assistants (RAs) are individuals who work under the direct and on-site supervision of the PI or a CI. RAs cannot conduct permitted activities in the absence of the PI or a CI.

3. Personnel involved in permitted activities must be reasonable in number and essential to conduct of the permitted activities. Essential personnel are limited to

a. individuals who perform a function directly supportive of and necessary to the permitted activity (including operation of vessels or aircraft essential to conduct of the activity),

b. individuals included as backup for those personnel essential to the conduct of the permitted activity, and

c. individuals included for training purposes.

4. Persons who require state or Federal licenses or authorizations (e.g., UAS operators) to conduct activities under the permit must be duly licensed/authorized and follow all applicable requirements when undertaking such activities.

5. Permitted activities may be conducted aboard vessels or aircraft, or in cooperation with individuals or organizations, engaged in commercial activities, provided the commercial activities are not conducted simultaneously with the permitted activities.

6. The Permit Holder cannot require or receive direct or indirect compensation from a person approved to act as PI, CI, or RA under this permit in return for requesting such approval from the Permits Division.

7. The Permit Holder or PI may designate additional CIs without prior approval from the Chief, Permits Division provided

a. A copy of the letter designating the individual and specifying their duties under the permit is forwarded to the Permits Division by facsimile or email on the day of designation.

b. The copy of the letter is accompanied by a summary of the individual's qualifications to conduct and supervise the permitted activities.

c. The Permit Holder acknowledges that the designation is subject to review and revocation by the Chief, Permits Division.

8. Where the Permit Holder is an institution/facility, the Responsible Party may request a change of PI by submitting a request to the Chief, Permits Division that includes a description of the individual's qualifications to conduct and oversee the activities authorized under this permit.

9. Submit requests to add CIs or change the PI by one of the following:

a. the online system at https://apps.nmfs.noaa.gov;

b. an email attachment to the permit analyst for this permit; or

c. a hard copy mailed or faxed to the Chief, Permits Division, Office of Protected Resources, NMFS, 1315 East-West Highway, Room 13705, Silver Spring, MD 20910; phone (301)427-8401; fax (301)713-0376.

D. Possession of Permit

1. This permit cannot be transferred or assigned to any other person.

2. The Permit Holder and persons operating under the authority of this permit must possess a copy of this permit when

   a. Engaged in a permitted activity.

   b. A protected species is in transit incidental to a permitted activity.

   c. A protected species taken or imported under the permit is in the possession of such persons.

3. A duplicate copy of this permit must accompany or be attached to the container, package, enclosure, or other means of containment in which a protected species or protected species part is placed for purposes of storage, transit, supervision or care.

E. Reporting

1. The Permit Holder must submit incident, annual, and final reports containing the information and in the format specified by the Permits Division.

   a. Reports must be submitted to the Permits Division by one of the following:

      i. the online system at https://apps.nmfs.noaa.gov;

      ii. an email attachment to the permit analyst for this permit; or

      iii. a hard copy mailed or faxed to the Chief, Permits Division.

   b. You must contact your permit analyst for a reporting form if you do not submit reports through the online system.

2. Incident Reporting

   a. If authorized takes have been exceeded as specified in Conditions A.2 and B.1, the Permit Holder must

      i. Contact the Permits Division by phone (301-427-8401) as soon as possible, but no later than 2 business days of the incident;

      ii. Submit a written report within 2 weeks of the incident as specified below; and

      iii. Receive approval from the Permits Division before resuming work. The Permits Division may grant authorization to resume permitted activities based on review of the incident report and in consideration of the Terms and Conditions of this permit.

b. Any time a serious injury or mortality of a protected species occurs, a written report must be submitted within two weeks.

c. The incident report must include (1) a complete description of the events and (2) identification of steps that will be taken to reduce the potential for additional serious injury and research-related mortality or exceeding authorized take.

3. Annual reports describing activities conducted during the previous permit year (from January 1 to December 31) must

a. be submitted by March 31st each year for which the permit is valid, and

b. include a tabular accounting of takes and a narrative description of activities and effects.

4. A final report summarizing activities over the life of the permit must be submitted by (November 30, 2022), or, if the research concludes prior to permit expiration, within 180 days of completion of the research.

5. Research results must be published or otherwise made available to the scientific community in a reasonable period of time. Copies of technical reports, conference abstracts, papers, or publications resulting from permitted research must be submitted the Permits Division.

F. Notification and Coordination

1. NMFS Regional Offices are responsible for ensuring coordination of the timing and location of all research activities in their areas to minimize unnecessary duplication, harassment, or other adverse impacts from multiple researchers.

2. The Permit Holder must ensure written notification of planned field work for each project is provided to the NMFS Regional Office listed below at least two weeks prior to initiation of each field trip/season.

a. Notification must include the

i. locations of the intended field study and/or survey routes;

ii. estimated dates of activities; and

iii. number and roles of participants (for example: PI, CI, boat driver, safety diver, Research Assistant “in training”).

b. Notification must be sent to the following Assistant Regional Administrator for Protected Resources:

Pacific Islands Region, NMFS, 1845 Wasp Blvd., Building 176, Honolulu, HI 96818; phone (808)725-5000; fax (808)973-2941

Email *(preferred)*: nmfs.pir.research.notification@noaa.gov.

3. Researchers must coordinate their activities with other permitted researchers to avoid unnecessary disturbance of animals or duplication of efforts. Contact the Regional Office listed above for information about coordinating with other Permit Holders.

G. Observers and Inspections

1. NMFS may review activities conducted under this permit. At the request of NMFS, the Permit Holder must cooperate with any such review by

   a. allowing an employee of NOAA or other person designated by the Director, NMFS Office of Protected Resources to observe permitted activities; and

   b. providing all documents or other information relating to the permitted activities.

H. Modification, Suspension, and Revocation

1. Permits are subject to suspension, revocation, modification, and denial in accordance with the provisions of subpart D [Permit Sanctions and Denials] of 15 CFR part 904.

2. The Director, NMFS Office of Protected Resources may modify, suspend, or revoke this permit in whole or in part

   a. in order to make the permit consistent with a change made after the date of permit issuance with respect to applicable regulations prescribed under section 103 of the MMPA and section 4 of the ESA;

   b. in a case in which a violation of the terms and conditions of the permit is found;

   c. in response to a written request[12] from the Permit Holder;

   d. if NMFS determines that the application or other information pertaining to the permitted activities (including, but not limited to, reports pursuant to Section E of this permit and information provided to NOAA personnel pursuant to Section G of this permit) includes false information; and

[12] The Permit Holder may request changes to the permit related to: the objectives or purposes of the permitted activities; the species or number of animals taken; and the location, time, or manner of taking or importing protected species. Such requests must be submitted in writing to the Permits Division in the format specified in the application instructions.

e. if NMFS determines that the authorized activities will operate to the disadvantage of threatened or endangered species or are otherwise no longer consistent with the purposes and policy in section 2 of the ESA.

3. Issuance of this permit does not guarantee or imply that NMFS will issue or approve subsequent permits or amendments for the same or similar activities requested by the Permit Holder, including those of a continuing nature.

I. Penalties and Permit Sanctions

1. A person who violates a provision of this permit, the MMPA, ESA, or the regulations at 50 CFR 216 and 50 CFR 222-226 is subject to civil and criminal penalties, permit sanctions, and forfeiture as authorized under the MMPA, ESA, and 15 CFR part 904.

2. The NMFS Office of Protected Resources shall be the sole arbiter of whether a given activity is within the scope and bounds of the authorization granted in this permit.

a. The Permit Holder must contact the Permits Division for verification before conducting the activity if they are unsure whether an activity is within the scope of the permit.

b. Failure to verify, where the NMFS Office of Protected Resources subsequently determines that an activity was outside the scope of the permit, may be used as evidence of a violation of the permit, the MMPA, the ESA, and applicable regulations in any enforcement actions.

As detailed above, the Permits Division would require individuals conducting the research activities to possess qualifications commensurate with their roles and responsibilities. In accordance, the only personnel authorized to conduct the research would be Dr. Olsen, listed Co-Investigators, and research assistants. We anticipate that requiring that the research be conducted by experienced personnel will further minimize impacts to the ESA-listed cetaceans that may be exposed to the stressors, as these individuals should be able to recognize adverse responses and cease or modify their research activities accordingly.

8.3 Exposure Analysis

In this section, we quantify the likely exposure of ESA-listed species to the activities and associated stressors that may result from the proposed action (Section 3). Table 1 specifies PIFSC and the Permits Division's proposed exposure to ESA-listed species associated with aerial surveys, vessel surveys, close approaches, and documentation, biological sampling, and tagging. In accordance with our regulations (50 C.F.R. §402), here we evaluate whether or not this proposed level of exposure is reasonably certain to occur.

In their application, PIFSC states the follow as justification for the proposed takes in Table 1:

"The take numbers requested are needed to ensure a high enough sample size to conduct the best and most thorough population assessments possible, and to allow for a variety of research objectives which alternate from one year to the next. Our requested take numbers were calculated based on the assumption that each expected take would be associated with the most invasive procedure to that individual. As an example, we would like to request an annual expected take of 40 dart/barb tags on bottlenose dolphins. In this example, we interpret this as we would like to dart/barb-tag up to 40 bottlenose dolphin individuals each year, and the other non-dart/barb tag procedures listed (e.g., passive acoustic recording, collect sloughed skin, count/survey, behavioral observations, photo-ID, skin and blubber biopsy sample) may or may not be performed to that individual during that day's take.

Biopsy - We have calculated our requested biopsy take numbers based on the likelihood of encountering a particular species and allowing a high enough number of takes to gather a satisfactory, successful, sample size to answer the questions we are mandated to ask. To conduct genetic stock structure analysis a sample size of 50 samples per strata is needed; sometimes there can be five to 10 genetic stocks within a species which could necessitate up to 500 successful samples. It is also important to collect a sample size that is relative to the population size to ensure we have sampled the genetic distribution as well as possible. In other cases, it is desirable to sample entire schools to answer questions about social structure. Furthermore it is desirable to continue to add to our genetics archive to continue to expand our geographic coverage of genetic samples across species, to detect trends in genetic distribution and in abundance over time.

We request to increase the number of biopsy attempts to five because the success rate of biopsy darting may vary and could be lower than 20 percent. The success rate is dependent on the combination of biopsier, weather, distance-to-animal and boat driver. In addition, our areas of operation frequently experience rough conditions (high Beaufort sea state and wind speed), which make biopsy attempts more challenging for both the driver and biopsier. It is rare that an animal would be targeted for biopsy more than three times during one encounter, but we conservatively request five attempts to allow for occasional low success rates. If signs of harassment such as rapid changes in direction, prolonged diving and other behaviors are observed from an individual or a group, then biopsy activities will be discontinued on that individual or group.

Tagging - We arrived at our tagging take requests based on the number of animals we hope to successfully tag, and then expanding that number to allow for a few malfunctioning tags (therefore needing to tag additional animals) and misses (resulting in a take, but where the animal did not receive a tag). In order to understand the behavior, movements and spatial use of a particular cetacean population/stock, it is necessary to deploy tags on multiple individuals within encountered groups, as well as throughout that population.

> Researchers may approach an animal up to three times in one day, with an exception for beaked whales and killer whales. We request to increase the number of approaches to five for these species because beaked whales and killer whales can dive for extended periods and travel much farther than 50 meters from where they dove while they are underwater. In order to collect meaningful data from these species, it may require approaching an individual up to five times."

With this explanation of take number estimates, our own evaluation of these take numbers in comparison to PIFSC and other researchers' annual reports for similar species and activities (NMFS 2015a; NMFS 2016e; NMFS 2017a), and the conservative assumption that all take that the Permit Division authorized *could* occur, we adopt the exposure of ESA-listed species that is reasonably certain to occur as that specified in Table 1.

Despite their names, the columns titled *Authorized Takes* and *No* in Table 1 do not necessarily reflect the number of animals that would be exposed or their repeat exposure, respectively (as further detailed below). Instead, *Authorized Takes* represent the maximum number of *takes* that would be authorized and *No* represents the maximum number of intentional repeat *takes* of the same individual. This exposure could occur year-round, with the duration of each exposure ranging from a few seconds to several hours as described in Section 3.

Given the Permits Division's issuance and counting of takes[13] and the fact that researchers may often not be able to identify individual animals in the field, the number specified in *Authorized Takes* in Table 1 does not necessarily reflect the number of animals that would be exposed to the research activities under Permit No. 20311. For example, if researchers take a whale on one day it would count as one individual taken. If the same individual were taken on another day that same year without realizing it, it would be counted as a different individual taken. This would result in the total annual number of individuals taken being less than in Table 1. This scenario also illustrates that researchers may unintentionally take the same whale more than once in a single year, and thus may not be able to adhere to the number specified in the *No* column. However, given the nature of fieldwork (unpredictability, reliance on equipment, personnel availability, and weather for operations, etc.) and the vast action area and range most ESA-listed cetaceans considered in this opinion inhabit, it is likely that many, if not all animals, would only be taken once or at most two to three times.

Given researchers inability to identify each individual animal in the field, the *Authorized Takes* presented in Table 1 represents the maximum number of individuals that could be exposed annually, and it is possible that individuals could be exposed more than the number of times specified in *No* in a given year. This exposure from directed research represents a relatively small number of animals from the populations of blue, fin, sei, and sperm whales found in the

[13] The Permits Division directs researchers to count and report one take per cetacean per day including all approaches and procedure attempts, regardless of whether a behavioral response to the permitted activity is observed.

action area. However, it is a relatively high number of individuals from the populations that may be found closes to Hawaii. In addition, it represents relatively high number of humpback (Western North Pacific DPS), false killer (Main Hawaiian Islands Insular DPS), and North Pacific right whales. In fact, in some cases more takes are authorized than there are thought to be animals in the entire population for these species, indicating that some individuals will likely be taken more than once. This high level of exposure for these species, and for blue, fin, sei and sperm whales around Hawaii is purposeful as PIFSC is responsible for conducting stock assessment reports under the MMPA for marine mammals within U.S. waters in the action area.

8.4 Response Analysis

Given the exposure detailed above, in this section we describe the range of responses among ESA-listed cetaceans that may result from the stressors associated with the research activities that would be authorized under Permit No. 20311. These include stressors associated with the following activities: manned and unmanned aerial surveys, vessel surveys, close approaches, and documentation, fecal and sloughed skin sampling, biopsy sampling, and tagging. We assess potential lethal, sub-lethal (or physiological), or behavioral responses that might reduce the fitness of individuals. Our response analysis considers and weighs evidence of adverse consequences, as well as evidence suggesting the absence of such consequences.

In general, all the research activities described in Section 3 have the potential to cause some sort of disturbance. Responses by animals to human disturbance are similar to their responses to potential predators (Beale and Monaghan 2004; Frid 2003; Frid and Dill 2002; Gill et al. 2001; Harrington and Veitch 1992; Lima 1998; Romero 2004). These responses manifest themselves as stress responses in which an animal perceives human activity as a potential threat and undergoes physiological changes to prepare for a flight or fight response or more serious physiological changes with chronic exposure to stressors. They can also lead to interruptions of essential behavioral or physiological events, alteration of an animal's time budget, or some combinations of these responses (Frid and Dill 2002; Romero 2004; Sapolsky et al. 2000; Walker et al. 2005). Further, these responses have been associated with abandonment of sites (Sutherland and Crockford 1993), reduced reproductive success (Giese 1996; Mullner et al. 2004), and the death of individual animals (Bearzi 2000; Daan 1996; Feare 1976).

The mammalian stress response involves the hypothalamic-pituitary-adrenal axis being stimulated by a stressor, causing a cascade of physiological responses, such as the release of the stress hormones adrenaline (epinephrine), glucocorticosteroids, and others (Busch and Hayward 2009; Gulland et al. 1999; St. Aubin and Geraci 1988; St. Aubin et al. 1996; Thomson and Geraci 1986). These hormones can subsequently cause short-term weight loss, the liberation of glucose into the blood stream, impairment of the immune and nervous systems, elevated heart rate, body temperature, blood pressure, and alertness, and other responses (Busch and Hayward 2009; Cattet et al. 2003; Dickens et al. 2010; Dierauf and Gulland 2001a; Dierauf and Gulland 2001b; Elftman et al. 2007; Fonfara et al. 2007; Kaufman and Kaufman 1994; Mancia et al. 2008; Noda et al. 2007; Thomson and Geraci 1986). In some species, stress can also increase an

individual's susceptibility to gastrointestinal parasitism (Greer 2008). In highly stressful circumstances, or in species prone to strong "fight-or-flight" responses, more extreme consequences can result, including muscle damage and death (Cowan and Curry 1998; Cowan and Curry 2002; Cowan and Curry 2008; Herraez et al. 2007). The most widely recognized hormonal indicator of vertebrate stress, cortisol, normally takes hours to days to return to baseline levels following a significantly stressful event, but other hormones of the hypothalamic-pituitary-adrenal axis may persist for weeks (Dierauf and Gulland 2001b). Mammalian stress levels can vary by age, sex, season, and health status (Hunt et al. 2006; Keay et al. 2006; Peters 1983). In addition, smaller mammals tend to react more strongly to stress than larger mammals (Hunt et al. 2006; Keay et al. 2006; Peters 1983).

In sum, the common underlying stressor of a human disturbance caused by the research activities that would occur under Permit No. 20311 may lead to a variety of different stress related responses. However, given the relatively short duration of the activities (a few seconds to several hours) relative to cetacean life histories (e.g., life expectancies of 60 to over 100 years), we do not anticipate these responses to result in negative fitness consequences. In addition to possibly causing a stress related response, each research activity is likely to produce unique responses as detailed further below. For incidental harassment that may result when animals are associated with individuals targeted for directed research, we expect responses to be similar to, or in most cases less than, those described below for each research activity, and above for general human disturbances.

8.4.1 Aerial Surveys

Responses to aerial surveys consist only of behavioral responses, which vary by species and aircraft type. As outlined below, behavioral responses to manned aerial surveys are likely more pronounced than to unmanned aerial surveys.

8.4.1.1 Manned Aerial Surveys

Aerial surveys that would be authorized under Permit No. 20311 may cause visual disturbance or noise that may affect ESA-listed cetaceans within the action area. Cetacean responses to aircraft depend on the animals' behavioral state at the time of exposure (e.g., resting, socializing, foraging or traveling) as well as the altitude and lateral distance of the aircraft to the animals (Luksenburg and Parsons 2009). The underwater sound intensity from aircraft is less than produced by boats; and visually, aircraft are more difficult for whales to locate since they aren't in the water and move rapidly (Richter et al. 2006). However, when aircraft fly below certain altitudes (about 500 meters), they have caused cetaceans to exhibit behavioral responses that might constitute a significant disruption of their normal behavioral patterns (Patenaude et al. 2002). Thus, aircraft flying at low altitude, at close lateral distances and above shallow water elicit stronger responses than aircraft flying higher, at greater lateral distances and over deep water (Patenaude et al. 2002; Smultea et al. 2008). The sensitivity to disturbance by aircraft may also differ among species (Wursig et al. 1998). Sperm whales have been observed to respond to a fixed-wing aircraft circling at altitudes of 245 to 335 meters by ceasing forward movement and

moving closer together in a parallel flank-to-flank formation, a behavioral response interpreted as an agitation, distress, and/or defense reaction to the circling aircraft (Smultea et al. 2008). About 14 percent of bowhead (*Balaena mysticetus*) whales approached during aerial surveys exhibited short-term behavioral reactions (Patenaude et al. 2002). While all ESA-listed whale species exposed to aerial surveys may exhibit short-term behavioral reactions, data from PIFSC from past permits indicated only mild behavioral responses, if any (NMFS 2016e; NMFS 2017b). For example, during past research PIFSC observed the follow responses, detailed as a percentage of the total number of aerial surveys conducted, during aerial surveys: a few animals looked up as the aircraft passed – 40 percent; a few animals looked up, and small section of the school briefly accelerated as the aircraft passed over – 35 percent; the school briefly accelerated and a portion of the school changed course and then returned to polarized swimming – 13 percent; the school swam faster (travelling speed) – 10 percent, and the school accelerated rapidly to a full speed and then slowed after the aircraft passed – 2 percent (NMFS 2017b). At no time did researchers observe schools panicking or cows with calves separating. Furthermore, conditions in the permit would require researchers to discontinue aerial surveys if animals exhibit repetitive, strong, adverse reactions. Therefore, it is expected the aerial surveys conducted during the proposed research activities would result in no reaction or only mild short-term behavioral reactions and not any long-term behavioral changes or reduction in fitness.

8.4.1.2 Unmanned Aerial Surveys

Unmanned aerial surveys that would be authorized under Permit No. 20311 may also cause visual or auditory disturbances to ESA-list cetaceans. Despite being conducted at much lower altitudes than manned aerial surveys, the aircraft used to conduct unmanned aerial surveys would be much smaller and quieter, indicating less of a behavioral response might be expect. While the use of UAS to study cetaceans is in its infancy, current data support this notion and indicate that cetaceans exhibit no behavioral response to UAS. For example Acevedo-Whitehouse et al. (2010) used a UAS at 13 meters over blue, gray (*Eschrichtius robustus*), humpback, and sperm whales, and observed no avoidance behaviors. Koski et al. (2015) used UAS over bowhead whales at 120 meters with no behavioral responses noted. SWFSC used UAS over killer whales (*Orcinus orca*) and found that at 35 meters, there were no behavioral reactions (Durban et al. 2015). Three recent reviews covering the potential impacts of UAS on marine mammals found no data to indicate that ESA-listed cetaceans behaviorally respond to UAS (Christie et al. 2016; Marine Mammal Commission 2016; Smith et al. 2016). However, in a recent report submitted to NMFS for Permit No. 18636, researchers documented behavioral responses by large whales when UAS were flown at a height of approximately 12 feet (NMFS 2017c). These responses consisted of mild, short-term change in behavior such as whales rolling over to view the UAS, or “bucking” before returning to pre-exposure behavior. Given the available information, we anticipate that in most cases, there will be no response to unmanned aerial surveys, but in some cases, mild short-term behavioral responses could occur.

8.4.2 Vessel Surveys and Close Approaches, and Documentation

Vessel surveys and close approaches would expose ESA-listed whales within the action area to vessel traffic, discharge, and visual and auditory disturbances. As noted previously, most documentation does not present any stressors outside of those associated with vessel surveys and close approaches. However, underwater documentation by divers presents an addition stressor of divers being in the water, approaching whales. The purpose of vessel surveys and close approaches are to allow researchers to conduct other activities, responses to which are described below in individual sections.

Vessel surveys necessarily involve transit within the marine environment, and the transit of any vessel in waters inhabited by whales carries the risk of striking a whale. Responses to a vessel strike can involve death, serious injury, or minor, non-lethal injuries. The probability of a vessel collision and the associated response depends, in part, on the size and speed of the vessel. The majority of vessel strikes of large whales occur when vessels are traveling at speeds greater than approximately 10 knots, with vessels traveling faster, especially large vessels (80 meters or greater), being more likely to cause serious injury or death (Conn and Silber 2013; Jensen and Silber 2004; Laist et al. 2001; Vanderlaan and Taggart 2007). While vessel strikes are possible during all research vessel transits, we are aware of only two instances of any research vessel ever striking a whale in thousands of hours at sea, and both are thought to have been non-lethal (Wiley et al. 2016). These vessel strike incidents are an important reminder that even with well-trained marine mammal observers and vessel operators, all vessels, even research vessels, have the potential to strike whales. Given the rarity of ships strikes of large whales during research activities, the extensive experience PIFSC has in spotting cetaceans at sea, and the slow speeds at which they would operate when near whales, we believe the likelihood of a vessel strike from research vessel transits is extremely unlikely. As such, we do not expect vessel strikes to occur, and in turn, we find effects from this stressor to be discountable and do not expect impacts to the fitness of individual whales.

Discharge from research vessels in the form of leakages of fuel or oil is possible, though effects of any spills would have minimal, if any, effects on ESA-listed cetaceans. Given the experience of the researchers and boat operators in conducting research activities in the action area, it is unlikely that spills or discharges will occur. If discharge does occur, the amounts of leakage would be small, disperse into the water, and not affect whales directly, or pose measurable hazards to their food sources. Therefore, we conclude that effects from this stressor are discountable, and it is not likely to affect the fitness of individual whales.

Close approaches by research vessels may cause visual or auditory disturbances to cetaceans and more generally disrupt their behavior, which may negatively influence essential functions such as breeding, feeding, and sheltering. Cetaceans react in a variety of ways to close vessel approaches. Responses range from little to no observable change in behavior to momentary changes in swimming speed and orientation, diving, surface and foraging behavior, and respiratory patterns, (Au and Green. 2000; Baker et al. 1983; Baumgartner and Mate 2003; Hall

1982; Isojunno and Miller 2015; Jahoda et al. 2003; Koehler 2006; Malme et al. 1983; Richardson et al. 1985; Scheidat et al. 2006; Watkins et al. 1981). Changes in cetacean behavior can correspond to vessel speed, size, and distance from the whale, as well as the number and frequency of vessels approaches (Baker et al. 1988; Beale and Monaghan 2004). Characteristics of the individual and/or the context of the approach, including age, sex, the presence of offspring, whether or not habituation to vessels has occurred, individual differences in reactions to stressors, and the behavioral state of the whales can also influence the responses to close vessel approaches (Baker et al. 1988; Gauthier and Sears 1999; Hooker et al. 2001; Koehler 2006; Lusseau 2004; Richter et al. 2006; Weilgart 2007; Wursig et al. 1998). Observations of large whales indicate that cow-calf pairs, smaller groups, and groups with calves appear to be more responsive to close vessel approaches (Bauer 1986; Bauer and Herman 1986; Clapham and Mattila 1993; Hall 1982; Williamson et al. 2016). Cetaceans may become sensitized or habituated to vessels as the result of multiple approaches (Constantine 2001), which could increase or decrease stress levels associated with additional approaches and or research activities following an approach. Reactions to vessel noise by bowhead and gray whales have been observed when engines are started at distances of 3,000 feet (Malme et al. 1983; Richardson et al. 1985), suggesting that some level of disturbance may result even if the vessel does not closely approach. It should be noted that human observations of a whale's behavioral response may not reflect a whale's actual experience; thus our use of behavioral observations as indicators of a whale's response to research may or may not be correct (Clapham and Mattila 1993).

Despite the varied observed responses to vessel approaches documented in the literature, and the multitude of factors that may affect an individual whale's response, we expect affects from close vessel approaches that would be authorized under Permit No. 20311 to be minimal for several reasons. First, PIFSC has years of experience approaching cetaceans in a way that is designed to minimize disturbance and associated responses. Second, the source levels of sounds that would be generated by research vessels are below that which could cause physical injury or temporary hearing threshold shifts, and they are unlikely to mask cetaceans ability to hear mates and other conspecifics for any significant amount of time (Hildebrand 2009; NOAA 2016). Finally, no long-term effects on behavior or fitness from disturbances caused by close vessel approaches for research have been documented, both by PIFSC and more generally in the literature. In their application, PIFSC notes that previously observed response to close vessel approaches range from "diving, tail slapping, changing direction, to no response". Furthermore, PIFSC states that "if an animal continues to react to the presence of the vessel, research activities are held to an absolute minimum and if necessary the approach is abandoned." Thus, based on accounts from PIFSC, responses documented in the literature, and the proposed method for closely approaching whales by vessel, we expect the proposed close approaches may produce short- to mid-term behavioral and stress responses, but will not significantly disrupt the normal behavioral patterns of whales to an extent that they would create the likelihood of injury or impact fitness. As a result, we do not expect close approaches to have fitness consequences for individual whales. This conclusion is based on close vessel approaches made during most research activities. The

anticipated response from the close approaches that would be required for tagging, which occur at much close distances (within a few meters) are further discussed below.

As noted above, documentation (written observation, photography and videography, etc.) that occurs from the vessel would not present any additional stressors to whales outside of those associated with a close vessel approach. However, underwater documentation by divers does present the additional stressor of two divers being in the water, approaching whales. While data on the response of large whales to divers, which constitute the majority of ESA-listed species considered in this opinion are lacking as compared to data for small cetaceans, the available literature indicates large whales exhibit attraction to divers or mild behavioral responses. In response to tourist divers, southern right whales (*Eubalaena australis*) appear to decrease resting, socializing, and surface active behavior and increase traveling and swimming speed, and reorient more, with mother/calf pairs exhibiting the strongest responses compared to other age and sex classes (Lundquist et al. 2013). In contrast, dwarf minke whales off the coast of Australia appear to be attracted to vessels and swimmers associated with swim-with-whale programs (Mangott et al. 2011). In PIFSC past research, they have observed both attraction to divers, and behavioral responses that may indicate disturbance, such as "swishing of the tail, posturing, moving away, diving deeper, and "flybys" from escorts" (NMFS 2017b). However, PIFSC has not observed any aggressive behavior and in many cases, whales maintained their position and behavior while divers were in the water. Under no circumstances would divers be authorized to contact whales, and no contact between whales and researchers has ever occurred (NMFS 2017b). In addition, underwater documentation would be terminated if whales exhibit adverse or evasive changes in behavior. Based on the available responses documented in the literature, responses observed during PIFSC's previous research efforts, and the mitigation measures proposed, we expect whales' may on occasion be attracted to divers, and at other times exhibit short- to mid-term behavioral and stress responses, but we do not expect underwater documentation will significantly disrupt the normal behavioral patterns of whales to an extent that it would create a likelihood of injury or impact fitness.

8.4.3 Biological Sampling

Under Permit No. 20311, PIFSC would be authorized to collect a variety of biological samples. The only stressors associated with fecal and sloughed skin sampling would be those associated with a potential close vessel approach as described above. No additional response is expected for these activities. However, biopsy sampling presents the stressors of a minor puncture wound and tissue collection, and also requires a slightly closer approach than most other research activities aside from tagging. In general, it is difficult to distinguish between animals' reactions to these different stressors without explicit studies designed to isolate the response to individual stressors, which to our knowledge have not be conducted. As such, below we describe the range of responses, both physiological and behavioral, to the overall procedure of biopsy sampling, and where data are available, indicate possible responses to specific stressors.

Physiological responses of cetaceans to biopsy sampling may include the biopsy site wound and associated healing, a stress response, serious injury, or even death (reviewed in Noren and Mocklin 2012). Responses vary by species, biopsy tip dimensions, the draw weight of the sampling method, and the distance from which animals are sampled (Noren and Mocklin 2012). However, generally speaking wounds from biopsy sampling heal quickly, often within a month or less, and show no signs of infection (Noren and Mocklin 2012). In fact, for at least some large whale species (e.g., southern right whales) immediately after sampling takes place, biopsy sites are hardly noticeable (Reeb and Best 2006). This is perhaps not surprising given that cetaceans have high rates of cell proliferation that enable them to heal from large shark inflicted wounds within months (Corkeron et al. 1987; Dwyer and Visser 2011; Lockyer and Morris 1990).

Beyond the wound itself, biopsy sampling could cause a physiological stress response similar to that described above in the beginning of this section, even if the biopsy dart does not successfully penetrate the animal's tissue. Such a response may involve the release of stress hormones, short-term weight loss, susceptibility to gastrointestinal parasitism, the liberation of glucose into the blood stream, impairment of the immune and nervous systems, an elevated heart rate, body temperature, blood pressure, and alertness, muscle damage, and death. However, given the small size of wounds created by biopsy sampling and the short duration in which the sampling occurs, stress responses to remote biopsy sampling are likely minimal.

Finally, biopsy sampling could result in serious injury or death. However, in over 40 years of researchers collecting biopsy samples from cetaceans, we are aware of only one example of such an event: a common dolphin death following biopsy sampling in 2000 (Bearzi 2000). Several possibly explanations exist for why this particular animal died including a dart stopper malfunction, the location of the biopsy wound, the thinness of the animal's blubber, the handling of the animal, and possibly this animal having a predisposition to catatonia and death during stressful events (Bearzi 2000). It is important to note that due to this animal's unusually thin blubber layer, the biopsy tip penetrated the animal's muscle, which is not the intent of most researchers' biopsy sampling efforts.

While the above discussion indicates a range of physiological responses to biopsy sampling, only minor wounds and low-level stress responses are anticipate as the result of biopsy sampling that would be conducted under Permit No. 20311. This is because all biopsy dart tips that PIFSC would use would be 1) thoroughly sterilized before sampling, thus minimizing any chances of infection, and 2) only penetrate the animal's blubber layer, not muscle, and thus result in no serious injury or death.

Cetaceans also exhibit a wide range of behavioral responses to biopsy sampling (reviewed in Noren and Mocklin 2012), and in some cases these are indistinguishable from those described below for penetrating tags (Reisinger et al. 2014). Most researchers report either no behavioral response or minor behavioral responses including changes in dive behavior, heading, or speed, and startle responses and tail flicks (Noren and Mocklin 2012). On occasion, researchers report similar low-level responses from animals nearby those being biopsied and to darts entering the

water, suggesting that some observed responses are a general startle response and not necessarily due to being contacted by the biopsy dart (Gorgone et al. 2008; Noren and Mocklin 2012). On rare occasions (zero to six percent of animals biopsied), researchers have reported more severe behavioral responses such as a flight response, breaching, multiple tail slaps, and/or numerous trumpet blows (Noren and Mocklin 2012). These more severe responses appear to coincide with instances where biopsy tips struck an unintended body part (e.g., dorsal fin) or when tips remain lodged in the animal (Berrow et al. 2002; Gauthier and Sears 1999; Weinrich et al. 1991; Weinrich et al. 1992). This being said, when darts remain in animals it does not appear to result in mortality, infection, or lasting behavioral changes (Barrett-Lennard et al. 1996; Clapham and Mattila 1993; Parsons et al. 2003). For all of these responses, it is important to keep in mind that in many cases it is hard to distinguish the behavioral response to biopsy sampling from the response to the close vessel approach (Pitman 2003). Regardless, in most instances animals return to pre-biopsying/close approach behavior quickly, usually within 30 seconds to three minutes (Noren and Mocklin 2012). In fact, biopsied individuals do not appear to avoid vessels during subsequent biopsy attempts (within one week to five months), and in many cases show the same or a lesser response to the second biopsying event (Noren and Mocklin 2012, although see Best et al. 2005).

A variety of factors influence how cetaceans behavioral respond to biopsy sampling including the species, age and sex, behavioral context, location, methods and or equipment used, type and size of the boat, size of the biopsy dart, season, water depth, and sea state (Noren and Mocklin 2012). For example, a higher proportion of odontocetes respond the biopsy sampling compared to mysticetes (Noren and Mocklin 2012). In some cases (Best et al. 2005), but not others (Weinrich et al. 1991), mothers and calves appear to be more sensitive to biopsy sampling than other age groups. Migrating humpback whales appear to be less responsive than those on the feeding grounds (Clapham and Mattila 1993; Weinrich et al. 1991), but on the feeding grounds, foraging whales are less likely to respond than resting whales (Weinrich et al. 1992).

Given the above overview of possible behavioral responses of cetaceans to biopsy sampling, and the mitigation measures proposed by the Permits Division and PIFSC (Section 8.2), we expect ESA-listed cetaceans to behaviorally respond to biopsy sampling by exhibiting short-term, minor to moderate changes in behavior, which we do not expect to impact any individual's fitness.

In summary, of the large number of cetaceans that have been biopsy sampled in recent decades (probably in the tens of thousands), there has been only one documented case of an immediate fitness consequence associated with biopsy sampling (Bearzi 2000). While studies on the delayed, long-term impacts of biopsy sampling are lacking, the available data suggests no effects to fitness (Best et al. 2005; Noren and Mocklin 2012). As such, we expect biopsy sampling to result in minor wounds, low-level stress responses, and temporary behavior changes, but we do not expect any individuals to experience reductions in fitness.

8.4.4 Tagging

PIFSC would be authorized to tag several ESA-listed cetacean species with either dart/barb (Type II) or suction-cup (Type III) tags. Tagging presents a variety of stressors including a very close approach (to within a few meters) and physical contact if a suction-cup tag is used or puncture wounds if dart/barb tags are used. Responses to these stressors may be physiological and/or behavioral in nature and likely differ depending on the tag attachment type. Below we detail the range of physiological and behavioral responses to tags based the timing of the response, from the initial tag deployment until the tag detaches.

8.4.4.1 Tag Deployment

Whales are likely to respond behaviorally to very close approaches for tag attachment in a similar way as previously described above for other close approaches. However, given the closer proximity of these approaches (one to 30 meters) we anticipate these responses will consist of the greater responses noted above such as momentary changes in swimming speed and orientation, diving, surface and foraging behavior, and respiratory patterns.

Concurrent with this response would be a response to the physical application of the suction-cup tag, or in the case of dart/barb tags, tag penetration and puncture wounds. However, current research examining how whales respond to tag attachments, regardless of type, does not usually distinguish between a whale's response to a very close approach and the tag attachment. Possible reasons for this include: (1) such responses are indistinguishable to researchers, (2) no proper controls exist to make such a distinction given that researcher generally do not approach very close unless they are also tagging, and (3) such a distinction is not warranted as whales themselves may not differentiate between the two stressors. As such, below we describe what is known about how whales respond behaviorally to the initial tag deployment, which includes the response to both the very close approach and the attachment of tags.

Previous studies have found that whales respond to suction-cup tag deployment (and missed attempts) in a variety of ways. In humpback whales, Goodyear (1989a; 1989b) observed quickened dives, high back arches, tail swishes (31 percent) or no reaction (69 percent) to suction-cup deployments. One breach was observed in roughly 100 taggings and no damage to skin was found (Goodyear 1989a; 1989b). Baird et al. (2000) observed only low (e.g., tail arch or rapid dive) to medium (e.g., tail flick) level reactions by humpbacks in response to suction-cup tag deployments. Baumgartner and Mate (2003) reported that strong reactions of North Atlantic right whales (*Eubalaena glacialis*) to suction-cup tag deployments were uncommon, and that 71 percent of the 42 whales closely approached for suction-cup tagging showed no observable reaction (22 of 28 that were successfully tagged and 8 of 14 that were unsuccessfully tagged). The remaining whales reacted by lifting their heads or flukes, rolling, back arching, beating their flukes, or performing head lunges. In a review on the effects of marking and tagging on marine mammals, Walker et al. (2012) found that cetaceans exhibited short-term behavioral responses to suction-cup tag deployments including changes in frequency of leaps and group speed, flinching, tail slapping, rapid swimming, and rapid surfacing attempts, but no long term fitness

consequences. To our knowledge, there are no studies indicating a physiological response to the attachment of suction-cup tags, but we believe a short-term, minor stress response as described at the beginning of Section 8.4 is possible.

The behavioral responses whales exhibit to the application of invasive tags, such as dart/barb, are similar to those described for suction-cup tags and very close vessel approaches (Walker et al. 2012). Furthermore, behavioral responses to dart/barb tags, as proposed here, to not appear to drastically differ from those noted for deeper penetrating implantable tags, which are not proposed as part of Permit No. 20311 (Mate et al. 2007; Mate et al. 2016; Robbins et al. 2016; Szesciorka et al. 2016; Walker et al. 2012). These responses include head lifts, fluke lifts, exaggerated fluke beats on diving, quick dives, or increased swimming speeds. Less frequent behavioral responses include fluke slaps, head lunges, fluke swishes, defecation, decreased surfacing rates, disaffiliation with a group of whales, evasive swimming behavior, cessation of singing, breaching, bubble blowing, or rapid acceleration (Mate et al. 2007; Mate et al. 2016; Szesciorka et al. 2016; Walker et al. 2012).

Given that dart/barb tags penetrate the animal's tissue, a physiological response is expected. Anticipated reactions to these puncture wounds include minor pain, cell damage, and possibly local inflammation, swelling, bleeding, blood clotting, hemorrhage, and bruising (Mate et al. 2016; NMFS 2016a; Robbins et al. 2016; Szesciorka et al. 2016; Walker et al. 2012; Weller 2008). However, since barb/darts would not penetrate beyond the blubber layer and the size of the puncture wounds would be small, very little bleeding, and no hemorrhage, blood clotting, or bruising is expected to occur from these types of tags. Furthermore, current evidence suggest such responses are rare, even for deeper penetrating implantable tags (Mate et al. 2016; NMFS 2016a; Robbins et al. 2016; Szesciorka et al. 2016; Walker et al. 2012; Weller 2008). In addition, a stress response to the deployment of invasive tags is possible, but the available data indicates such a response would be short-term and minimal (Eskesen et al. 2009). If the penetrating tips of tags were contaminated, a viral, fungal, or bacterial infection is possible (Haulena 2016; NMFS 2016f; Weller 2008). However, given that PIFSC would thoroughly sterilize all tags prior to deployment, infection is unlikely. That said, tag sterilization does not preclude the possibility that a pathogen on the whales skin enters the body upon tag insertion (Weller 2008).

There is also a possibility that some dart/bar tags may break upon impact or soon after, leaving parts of these tags (e.g., petals) in the animal with no tag attached. However, such an event is unlikely given that recent tag modifications made by researchers have greatly reduced or eliminated tag breakage (Robbins et al. 2016; Szesciorka et al. 2016). Furthermore, even if such an event were to occur, we do not anticipate the response to this initial tag breakage to be any different from that described above. However, as discussed below, such tag breakage may have adverse impacts beyond the initial tagging event.

In their permit application, PIFSC notes similar behavioral and physiological responses to the initial tag deployment to those described above (NMFS 2017b). Based on this and the information presented above, we expect behavioral responses to initial tag deployments

(including unsuccessful attempts) to consist of brief, low-level to moderate behavioral responses. We do not anticipate any physiological responses to the initial attachment of suction-cup tags other than those associated with a minor stress response. For dart/barb tags, a range of physiological responses is possible, but the initial deployment of tags is not expected to result in serious injury. Based on all of these responses, we do not anticipate that the initial tag deployment will affect the fitness of individual whales.

8.4.4.2 Continued Tag Attachment

Once tagged, whales may respond both behavioral and physiologically to the continued attachment of tags. For all types of tags, current studies suggest little to no measurable impact on whale behavior. In suction-cup tagging humpback whales, Baird et al. (2000) observed pre-tagging behavior within minutes and no long term or strong reactions. Baumgartner and Mate (2003) reported that suction-cup tagged North Atlantic right whales resumed normal foraging dives within two dives post tag attachment, indicating that the continued attachment of the tag had little effect on their behavior. For implantable tags, which penetrate deep and stay on longer than the dart/barb tags being proposed here, researchers also note that whales appear to return to baseline behavior within minutes of the initial tagging event. For example, blue and humpback whales tagged with implantable tags appear to resume feeding soon after being tagged (Mate et al. 2007; Robbins et al. 2016). Robbins et al. (2016) reported that the median time it took humpback whales in the Gulf of Maine to recover behaviorally from being tagged with implantable tags was nine minutes. However, recovery times for some individuals were extensive, lasting at least 4.5 hours for one individual, which appeared to be related to tag design flaws and the placement of the tag lower on the animal's body than is proposed here (Robbins et al. 2016). This suggests that under some circumstances, at least some individuals (and/or species) exhibit more extended behavioral responses to tagging. However, all but one whale in this study observed on subsequent days appeared to resume species typical behavioral (Robbins et al. 2016). Thus, for most species and circumstances, behavioral response to continued attachment of tags is expected to be mild and short-term. These behavioral responses are in line with those described by PIFSC in their application from previous work (NMFS 2017b).

While similar long-term behavioral responses are expected for the different tag types, they differ in the long-term physiological responses they are likely to elicit. For suction-cup tags, almost no physiological response is expected. While the continued attachment of suction-cup tags could cause inflammation and hyperemia at the attachment site, such responses would be short term and minimal (NMFS 2016g). In contrast, dart/barb tags maintain long-term (months) penetration within the animal, which may lead to a variety of short-term or chronic responses including pain, tissue damage, inflammation, swelling, and/or depression, change in skin pigmentation and/or skin loss, tissue extrusion, exudate, serious injury, infection, changes in reproduction, or even death.

The available data on the physiological responses of cetaceans to the continued attachment of invasive tags are primarily limited to short-term effects, as few studies have attempted to follow

up on tagged individuals weeks, months, or years after tagging. In general, wounds from invasive tags heal with only minor scaring and indentation (Best et al. 2015; Calambokidis 2015; Hanson et al. 2008; NMFS 2016c; Norman et al. in review; Robbins et al. 2016; Szesciorka et al. 2016). Long-term impacts, however, remain difficult to gauge (Mate et al. 2007). Several studies have examined long-term impacts of invasive tags and have not found any. In a study on false killer and pilot whales, researchers found no significant difference in survival (Baird et al. 2013). One recent study investigating long-term impacts from dart/barb tags on cetaceans in Hawaii found little evidence of any impacts on survival or reproduction (Andrews et al. 2015), although the power to detect significant differences was very low. In studying the effects of implantable tags, which are more invasive than the dart/barb tags proposed here, on southern right whales, Best et al. (2015) found similar calving rates between tagged and un-tagged females. Thus, in most instances where researchers have attempted to document long-term impacts of invasive tagging on fitness, they have failed to detect any negative effects. However, we are aware of three recent studies that suggests at least older tag designs may result in negative long-term fitness consequences.

Gendron et al. (2014) monitored the wound site of a broken subdermal attachment from an invasive satellite tag somewhat similar to the dart/barb tags being proposed here, on an adult female blue whale over a period of 16 years (1995-2011). In 2005, ten years after tag deployment, the tag attachment remained embedded in the whale, with swelling less than 60 centimeters in diameter observed at the site of the attachment. In 2006, 11 years after tag deployment, the sub-dermal attachment had been expelled, leaving an open wound with blubber tissue apparently visible at the center of the swelling, which appeared to have decreased in size compared to two years before. The whale was last seen in 2011 with a scar (closed wound) present at the tag site. The whale's calving history showed three calves; two were observed prior to, and one after, the swelling period (1999-2007). Though there was not definitive evidence of the tag attachment's effect on reproduction, the authors suggested that it may have affected the female's reproductive success during this period (Gendron et al. 2014).

In a study on the effects of implantable tags on humpback whales in the Gulf of Maine, Robbins et al. (2016) examined the effects of implantable tags on vital rates of both males and females. For both sexes, there did not appear to be any effect on survival and many tagged females continued to successfully reproduce. However, tagging did appear to increase females' inter-birth intervals, with non-tagged females being nearly twice as likely to produce a calf compared to tagged females in the year following the initial tagging (or relevant year for non-tagged females). This suggest that implantable tagging may have an effect on pregnancy. Following this first year after tagging, tagged and non-tagged females appeared to be similarly likely to reproduce. Additional analyses investigating the effects of different tag models indicated that this impact on reproduction may have been due to a tag design flaw that lead to tag breakage and parts of the tag being left inside the whale after the tag detached. This flaw was recently addressed with the fully integrated implantable, and more recent data using these tags does not currently show the same negative effect on reproduction (NMFS 2017a; Robbins et al. 2016).

In examining the health effects and long-term impacts of implantable tags on large whales in the Pacific, Calambokidis (2015) used photographs and sightings records to evaluate tag-site wound healing and tagging effects on survival. Data came from a variety of long-term studies on blue and gray whales, which were tagged with implantable tags between 1993 and 2008 for blue whales, and in 2011 and 2013 for gray whales. While no effect on re-sighting rate was found for blue whales, tagged gray whales appeared to be less likely to be seen in subsequent years as compared to a control group. When sighting data were used in Cormack-Jolly-Seber capture recapture models to examine the effects of tagging on survival, there was no unequivocal evidence to support a tagging effect on survival, but several of the top models included a negative effect of tagging. Given this and the small sample size, caution should be used when interpreting these results, and effects of tagging on gray whale survival appear to be possible.

Importantly, two of these studies involved implantable tags, which are not being proposed here, and all involved much older tag technologies than would be used by PIFSC under Permit No. 20311. In recent years, many advances in tag technology have been made both to improve data collection and to minimize and avoid adverse impacts to tagged animals. These include smaller tag designs, stronger materials, fully-integrated designs, improved sterilization techniques, and better tag application methods, all of which are incorporated in tags that would be used under Permit No. 20311. With these improvements, the chances of long-term adverse effects are greatly reduced (Mate et al. 2007; NMFS 2016c; Robbins et al. 2016; Szesciorka et al. 2016). However, even with these advances impacts to fitness can still occur, as exemplified by the recent death of a Southern Resident DPS killer whale.

In 2016, the death of a Southern resident killer whale, L95, was reported following attachment of a dart/barb tag under Permit No. 16163. An expert veterinary panel concluded that a fungal infection developed at the tag site, as determined by gross dissection, radiographs, magnetic resonance imaging and histopathology, though the killer whale presented in moderate to advanced decomposition at the time of necropsy (Haulena 2016; NMFS 2016f). This fungal infection contributed to illness in the whale and most likely contributed to its death. There were several factors in this case that may have predisposed this whale to a fungal infection at the tagging site including: incomplete disinfection of the tag after seawater contamination, retention of the tag petals which may have allowed for formation of a biofilm or direct pathogen implantation, placement of the tag lower on the body and near large bore vessels which increased the chance of fungal dissemination through the blood system, poor body condition, and possible immunosuppression.

The case of L95 is an important reminder that all invasive tags carry some risk of death, even if minimal. However, the circumstances that lead to L95's death are extremely unlikely to occur under Permit No. 20311 for several reasons. First, PIFSC would not attempt to tag any individual that appears to be in poor health. Second, PIFSC would follow stringent sterilization methods as described in their application, and the permit terms and conditions. While PIFSC's current Institutional Animal Care and Use Committee agreement was approved prior to L95's death,

during consultation we confirmed with the Permits Division and PIFSC that they will use updated, improved sterilization techniques, as recently approved for Permit No 20465 on which we consulted (NMFS 2017a). Third, PIFSC would use the latest tag technologies to minimize chances of tag breakage. Given these measures, we find it highly unlikely that the use of invasive tags on blue, false killer (Main Hawaiian Islands Insular DPS), fin, humpback (Western North Pacific DPS), North Pacific, sei, and sperm whales would result in the death of any individual whale.

In summary, we expect whales to show minor to no behavioral response to the continued attachment of tags. For suction-cup tags, we also anticipate little to no physiological response to the continued attachment of the tag. For dart/barb tags, we anticipate most wounds would heal with little to no complication and minimal scaring, with only a few animals exhibiting prolonged healing and scaring. Given recent advances in tagging technologies and the mitigation measures proposed by the Permits Division and PIFSC, we find it unlikely that mortality or a reduction in fitness will result from invasive tagging. However, as indicated by the above review, mortality and fitness impacts have been documented in the literature for older tag designs or under extenuating circumstances (e.g., L95). Thus, while we find that effects to fitness from the invasive tags proposed here are not likely to occur, invasive tagging is not without risk.

8.5 Risk Analysis

In this section we assess the consequences of the responses to the individuals that have been exposed, the populations those individuals represent, and the species those populations comprise. Whereas the *Response Analysis* (Section 8.4) identified the potential responses of ESA-listed species to the proposed action, this section summarizes our analysis of the expected risk to individuals, populations, and species given the expected exposure to those stressors (as described in Section 8.3) and the expected responses to those stressors (as described in Section 8.4).

We measure risks to individuals of endangered or threatened species using changes in the individuals' "fitness," which may be indicated by changes the individual's growth, survival, annual reproductive success, and lifetime reproductive success. When we do not expect ESA-listed animals exposed to an action's effects to experience reductions in fitness, we would not expect the action to have adverse consequences on the viability of the populations those individuals represent or the species those populations comprise. As a result, if we conclude that ESA-listed animals are *not* likely to experience reductions in their fitness, we would conclude our assessment. If, however, we conclude that individual animals are likely to experience reductions in fitness, we would assess the consequences of those fitness reductions on the population(s) those individuals belong to.

As noted in the *Response Analysis*, none of the research activities as proposed with the mitigation measures to minimize exposure and associated responses, are expected reduce the long-term fitness of any individual ESA-listed cetacean. As such, the issuance of Permit No. 20311 is not expected to present any risk to populations, DPSs, or species listed under the ESA.

9 CUMULATIVE EFFECTS

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 C.F.R. §402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

This section attempts to identify the likely future changes and their impact on ESA-listed and their critical habitats in the action area. This section is not meant to be a comprehensive socio-economic evaluation, but a brief outlook on future changes on the environment. Projections are based upon recognized organizations producing best-available information and reasonable rough-trend estimates of change stemming from these data. However, all changes are based upon projections that are subject to error and alteration by complex economic and social interactions. During this consultation, we searched for information on future state, tribal, local, or private (non-Federal) actions reasonably certain to occur in the action area. We did not find any information about non-Federal actions other than what has already been described in the *Environmental Baseline* (Section 7), which we expect will continue in the future. Anthropogenic effects include climate change, whaling and subsistence harvesting, vessel strikes, whale watching, sound, military activities, fisheries, pollution, and scientific research, although some of these activities would involve a federal nexus and thus be subject to future ESA section 7 consultation. An increase in these activities could result in an increased effect on ESA-listed species; however, the magnitude and significance of any anticipated effects remain unknown at this time. The best scientific and commercial data available provide little specific information on any long-term effects of these potential sources of disturbance on cetacean populations.

10 INTEGRATION AND SYNTHESIS

The *Integration and Synthesis* section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the *Effects of the Action* (Section 8) to the *Environmental Baseline* (Section 7) and the *Cumulative Effects* (Section 9) to formulate the agency's opinion as to whether the proposed action is likely to: (1) reduce appreciably the likelihood of both the survival and recovery of a ESA-listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the *Status of Endangered Species Act Protected Resources* (Section 6).

The following discussions summarize the probable risks the proposed action poses to threatened and endangered species. This summary integrates the exposure profile presented previously with the results of our response analysis for the proposed action considered in this opinion.

As discussed in Section 6.1, ESA-listed species occur within the action area and may be affected by Permit No. 20311. However, several are not likely to be adversely affected because the effects of the proposed actions are insignificant, or discountable. These include Hawaiian monk seals, and green (Central North Pacific, Central West Pacific, East Indian-West Pacific, and Central South Pacific DPSs), hawksbill, leatherback, loggerhead (North Pacific and South Pacific DPSs), and olive ridley turtles (Mexico's Pacific Coast Breeding and All other areas).

The remaining ESA-listed species that may be affected by the proposed action, blue, false killer (Main Hawaiian Islands Insular DPS), fin, humpback (Western North Pacific DPS), North Pacific right, sei, and sperm whales, are likely to be adversely affected by the proposed action. On an annual basis over the five-year life of the permit, a maximum of 250 blue, 500 false killer (Main Hawaiian Islands Insular DPS), 250 fin, 500 humpback (Western North Pacific DPS), 40 North Pacific right, 250 sei, and 1000 sperm whale aerial survey takes would occur, and individuals may be exposed to more than one aerial survey. In addition, 525 blue, 1,145 false killer (Main Hawaiian Islands Insular DPS), 520 fin, 910 humpback (Western North Pacific DPS), 130 North Pacific right, 515 sei, and 1,575 sperm whale vessel survey takes would occur, and individuals may be exposed to more than one vessel survey. As part of these vessel surveys, whales would be exposed to close approaches, documentation, and non-invasive biological sampling. Finally, 125 blue, 145 false killer (Main Hawaiian Islands Insular DPS), 120 fin, 60 humpback (Western North Pacific DPS), 50 North Pacific right, 115 sei, and 325 sperm whale invasive takes (biopsy, tagging, etc.) would occur. However, for these takes repeat exposure of any individual within a given year is unlikely. In addition to these takes directed at ESA-species, PIFSC would be authorized to take unidentified roquals, some of which may be ESA-listed cetaceans, by the means and limits specified in Table 1. This level of exposure represents a relatively small proportion of the blue, fin, sei, and sperm whales found in the action area, but a substantial proportion of those populations of these species found around Hawaii, and a considerable proportion of the populations of humpback (Western North Pacific DPS), false killer (Main Hawaiian Islands Insular DPS), and North Pacific right whales found within the action area. Based on the best available data, responses to non-invasive research activities range from no response, to mild behavioral and stress responses. Biopsy sampling and tagging responses include similar behavioral and stress responses, as well as puncture wounds, but these activities are not expected to result in infection, long-term adverse health impacts, or effects on fitness.

The status of each species, as described in Section 6, varies greatly. At least one of the blue whale populations within the action area is showing signs of recovery, with a relatively large, stable population that may even be approaching carrying capacity. In contrast, false killer whales (Main Hawaiian Islands Insular DPS) were only recently listed under the ESA and have a small population which may be in decline. Like blue whales, at least one population of fin whale within the action area is quite large and appears to be recovery. The Western North Pacific DPS of humpbacks have an intermediate population size compared to other ESA-listed humpbacks, but a population trend for this DPS is unavailable at this time making it difficult to assess its

recovery trajectory. Very little information exists on North Pacific right whales, but the population is likely quite small putting them at great risk of extinction. Similarly, little is known about sei whales but existing estimates indicate a relatively large abundance within the action area, but an unknown population trend. Sperm whales are likely one of the most abundant large whale species, and thus globally are showing strong signs of recovery. Within the action area, little is known about the sperm whale populations. The overall abundance is estimated to be large, despite the population around Hawaii being relatively small.

A variety of current and past anthropogenic threats impacts these ESA-listed cetaceans within the action area including climate change, whaling and subsistence harvesting, vessel strikes, whale watching, sound, military activities, fisheries, pollution, and scientific research. Perhaps the most significant direct anthropogenic threats these cetaceans currently face are vessel strikes and entanglement in fishing gear. Although other factors remain significant threats, the direct impact on ESA-listed cetaceans is more difficult to assess. All of these activities are expected to continue into the future, but the magnitude at which, and their future impacts on the survival and recovery of ESA-listed species is not reliably predictable.

Considering the activities to which the ESA-listed species within the action area are likely to be exposed, their potential responses to these activities, the status of each species, and the baseline anthropogenic threats they face, we determined that the issuance of research Permit No. 20311 will result in minor behavioral and physiological responses, which are not likely to result in negative consequences to the fitness of individual whales.

11 CONCLUSION

After reviewing the current status of the ESA-listed species, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent actions, and cumulative effects, it is the NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence or recovery of Hawaiian monk seals; green (Central North Pacific, Central West Pacific, East Indian-West Pacific, and Central South Pacific DPSs), hawksbill, leatherback, loggerhead (North Pacific and South Pacific DPSs), and olive ridley turtles (Mexico's Pacific Coast Breeding and All other areas); and blue, false killer (Main Hawaiian Islands Insular DPS), fin, humpback (Western North Pacific DPS), North Pacific right, sei, and sperm whales.

12 INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by regulation to include significant habitat modification or degradation that results in death or injury to ESA-listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Harass is further defined as an act that "creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (NMFSPD 02-110-19). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this incidental take statement.

All activities associated with the issuance of Permit No. 20311 involve directed take for the purposes of scientific research. Therefore, NMFS does not expect the proposed action would incidentally take threatened or endangered species. However, we request that the Permits Division report to us the take as specified in Table 1 that actually occurs at the expiration of the permit, as well as any information on the response animals exhibited to those takes. Such information will be used to inform the *Environmental Baseline* and *Effects of the Action* sections for future consultations for PIFSC and other similar research activities.

13 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on ESA-listed species or critical habitat, to help implement recovery plans or develop information (50 C.F.R. §402.02).

We make the following conservation recommendations, which would provide information for future consultations involving the issuance of permits that may affect ESA-listed whales as well as reduce harassment related to the authorized activities:

1. **Aggregate Take Tracking**

   We recommend that the Permits Division develop a system for tracking and evaluating the amount of take issued and that which is realized for any given population of ESA-listed species. While the Permits Division's current permit tracking allows tracking of individual permit takes, and for understanding the extent of research at broad scales (e.g., number of research permits in a particular region), it remains difficult to quantify the extent of take each individual population of ESA-listed species may be subject to across permits for any given period of time. Such aggregate take tracking would better enable the Permits Division and us to evaluate the impacts of multiple, simultaneous research efforts on ESA-listed species.

2. **Reporting**

   We recommend the Permits Division tailor the required reporting for research permits to go beyond that needed to demonstrate compliance, in order to aid managers in collecting the information needed to better protect and conserve ESA-listed species. In requiring

researchers to provide annual reports, the Permit's Division is positioned to collect unprecedented, nation-wide data on ESA-listed species, which in some cases may take years to surface in the peer-reviewed public literature. For large baleen whale species, the Permits Division may consider discussing what data gaps exist with designated recovery coordinators and work on specific reporting requirements that aid those managers in obtaining the necessary data, and then make an annual report of these data available to managers and the public.

3. **Data Sharing**

   We recommend the Permits Division work to establish protocols for data sharing among all permit holders. While many researchers in the community collaborate, having a national standard for data sharing among all researchers permitted by NMFS will reduce impacts to trusted resources by minimizing duplicated research efforts. We recommend basic information be required from each researcher including the species, location, number of individuals, and age, sex, and identity if known be reported at the expiration of each permit. This information could be further refined based on our second conservation recommendation above and then be made available to all other permit holders and/or applicants, and preferably the public.

4. **Coordination Meetings**

   The Permits Division should continue to work with the NMFS' Regional Offices to conduct meetings among regional species coordinators, permit holders conducting research within a region, and future applicants to ensure that the results of all research programs or other studies on specific threatened or endangered species are coordinated among the different investigators. Such meetings may be a venue to discuss the details outlined in our second conservation recommendation.

In order for NMFS' Office of Protected Resources Endangered Species Act Interagency Cooperation Division to be kept informed of actions minimizing or avoiding adverse effects on, or benefiting, ESA-listed species or their critical habitat, the Permits Division should notify the Endangered Species Act Interagency Cooperation Division of any conservation recommendations they implement in their final action.

14 REINITIATION NOTICE

This concludes formal consultation for the Permits Division's proposal to issuance Permit No. 20311. As 50 C.F.R. §402.16 states, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if:

(1) The amount or extent of taking specified in the incidental take statement is exceeded.
(2) New information reveals effects of the agency action that may affect ESA-listed species or critical habitat in a manner or to an extent not previously considered.

(3) The identified action is subsequently modified in a manner that causes an effect to ESA-listed species or designated critical habitat that was not considered in this opinion.
(4) A new species is listed or critical habitat designated under the ESA that may be affected by the action.

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16 APPENDICES

Appendix A: Draft Permit No. 20311 (June 20, 2017)

*Final permit may have minor changes that would not affect this opinion. Permit No. 20311

Permit No. 20311

Expiration Date: June 30, 2022

Reports Due: March 31, annually

PERMIT TO TAKE PROTECTED SPECIES[14] FOR SCIENTIFIC PURPOSES

I. Authorization

This permit is issued to the Pacific Islands Fisheries Science Center, 1845 Wasp Boulevard, Building 176, Honolulu, HI 96818, (hereinafter "Permit Holder"), [Responsible Party: Evan Howell, Ph.D.], pursuant to the provisions of the Marine Mammal Protection Act of 1972 as amended (MMPA; 16 U.S.C. 1361 *et seq.*); the regulations governing the taking and importing of marine mammals (50 CFR Part 216); the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq.*); and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR Parts 222-226).

II. Abstract

The objectives of the permitted activity, as described in the application, are to determine the abundance, distribution, stock structure, movement patterns, and ecological relationships of cetaceans occurring in U.S. and international waters of the Pacific Islands Region.

III. Terms and Conditions

The activities authorized herein must occur by the means, in the areas, and for the purposes set forth in the permit application, and as limited by the Terms and Conditions specified in this permit, including attachments and appendices. Permit noncompliance constitutes a violation and is grounds for permit modification, suspension, or revocation, and for enforcement action.

A. Duration of Permit

[14] "Protected species" include species listed as threatened or endangered under the ESA, and marine mammals.

1. Personnel listed in Condition C.1 of this permit (hereinafter "Researchers") may conduct activities authorized by this permit through June 30, 2022. This permit expires on the date indicated and is non-renewable. This permit may be extended by the Director, NMFS Office of Protected Resources, pursuant to applicable regulations and the requirements of the MMPA and ESA.

2. Researchers must immediately stop permitted activities and the Permit Holder must contact the Chief, NMFS Permits and Conservation Division (hereinafter "Permits Division") for written permission to resume

   b. If serious injury or mortality[15] of protected species occurs.

   d. If authorized take[16] is exceeded in any of the following ways:

      iv. More animals are taken than allowed in Table 1 of Appendix 1.

      v. Animals are taken in a manner not authorized by this permit.

      vi. Protected species other than those authorized by this permit are taken.

   e. Following incident reporting requirements at Condition E.2.

3. The Permit Holder may continue to possess biological samples[17] acquired[18] under this permit after permit expiration without additional written authorization, provided the samples are maintained as specified in this permit.

[15] This permit does not allow for unintentional serious injury and mortality caused by the presence or actions of researchers. This includes, but is not limited to: deaths of dependent young by starvation following research-related death of a lactating female and deaths resulting from infections related to sampling procedures or invasive tagging; Note that for marine mammals, a serious injury is defined by regulation as any injury that will likely result in mortality.

[16] By regulation, a take under the MMPA means to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill any marine mammal. This includes, without limitation, any of the following: The collection of dead animals, or parts thereof; the restraint or detention of a marine mammal, no matter how temporary; tagging a marine mammal; 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 marine mammal; and feeding or attempting to feed a marine mammal in the wild. Under the ESA, a take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to do any of the preceding.

[17] Biological samples include, but are not limited to: carcasses (whole or parts); and any tissues, fluids, or other specimens from live or dead protected species; except feces, urine, and spew collected from the water or ground.

[18] Authorized methods of sample acquisition are specified in Appendix 1.

B. Number and Kind(s) of Protected Species, Location(s) and Manner of Taking

1. The table in Appendix 1 outlines the number of protected species, by species and stock, authorized to be taken, and the locations, manner, and time period in which they may be taken.

2. Researchers working under this permit may collect visual images (e.g., photographs, video) in addition to the photo-identification or behavioral photo-documentation authorized in Appendix 1 as needed to document the permitted activities, provided the collection of such images does not result in takes.

3. The Permit Holder may use visual images and audio recordings collected under this permit, including those authorized in Table 1 of Appendix 1, in printed materials (including commercial or scientific publications) and presentations provided the images and recordings are accompanied by a statement indicating that the activity was conducted pursuant to NMFS ESA/MMPA Permit No. 20311. This statement must accompany the images and recordings in all subsequent uses or sales.

4. The Chief, Permits Division may grant written approval for personnel performing activities not essential to achieving the research objectives (e.g., a documentary film crew) to be present, provided

d. The Permit Holder submits a request to the Permits Division specifying the purpose and nature of the activity, location, approximate dates, and number and roles of individuals for which permission is sought.

e. Non-essential personnel/activities will not influence the conduct of permitted activities or result in takes of protected species.

f. Persons authorized to accompany the Researchers for the purpose of such non-essential activities will not be allowed to participate in the permitted activities.

d. The Permit Holder and Researchers do not require compensation from the individuals in return for allowing them to accompany Researchers.

5. Researchers must comply with the following conditions related to the manner of taking:

Counting and Reporting Takes

u. Count and report a take of a cetacean regardless of whether you observe a behavioral response to the permitted activity.

v. Count and report 1 take per cetacean per day including all approaches[19] in water and attempts to remotely biopsy and tag.

w. During manned aerial surveys flown at an altitude lower than 1,000 feet, count and report 1 take per cetacean observed per day, regardless of the number of passes.

x. During Unmanned Aircraft System (UAS) surveys, count 1 take per cetacean approached per day, regardless of the number of passes.

General

y. Researchers must approach animals cautiously and retreat if behaviors indicate the approach may be interfering with reproduction, feeding, or other vital functions.

z. Where females with calves are authorized to be taken, Researchers:

vi. Must immediately terminate efforts if there is any evidence that the activity may be interfering with pair-bonding or other vital functions;

vii. Must not position the research vessel between the mother and calf;

viii. Must approach mothers and calves gradually to minimize or avoid any startle response;

ix. Must discontinue an approach if a calf is actively nursing; and

[19] An "approach" is defined as a continuous sequence of maneuvers involving a vessel, equipment, or researcher's body, including drifting, directed toward a cetacean or group of cetaceans closer than 100 yards for baleen and sperm whales and 50 yards for all other cetaceans.

x. Must, if possible, sample the calf first to minimize the mother's reaction when sampling mother/calf pairs.

For underwater filming/photography:

aa. No more than 2 divers may be in the water at one time during research. An underwater approach/activity must be terminated if a cetacean exhibits adverse/evasive changes in behavior. Use of an additional diver requires approval by the NMFS Permits Division.

bb. Research Assistants may conduct underwater activities only if they are trained photographers, videographers, or safety divers.

For research on humpbacks in Hawaii:

cc. Vessels engaged in research activities must fly a clearly visible triangular pennant at all times. The pennant must be yellow with minimum dimensions of 18"H x 26"L and with the permit number displayed in 6" high black numerals.

Aerial Survey

dd. Aerial flights must not be conducted over pinnipeds on land.

Manned Aerial Surveys

ee. Manned aerial surveys must be flown at an altitude of 700 feet. Descents for photo identification and behavioral observations must be no lower than 500 feet.

Unmanned Aircraft Systems (UAS)

ff. Researchers are authorized to use a fixed wing and vertical take-off and landing (VTOL) unmanned aircraft system (UAS).

gg. UAS must be flown at an altitude no lower than 75 feet for VTOL and no lower than 200 feet for fixed wing systems.

Remote Biopsy and Tagging

hh. Researchers may attempt (deploy or discharge/fire) each procedure (biopsy and tag) on an animal 3 times a day.

ii. A biopsy or tag attachment attempt must be discontinued if an animal exhibits repetitive, strong, adverse reactions to the activity or vessel.

jj. Researchers may biopsy sample and tag calves, depending on their age and species. See Appendix 1 for details.

kk. Before attempting to biopsy/tag/sample an individual, Researchers must take reasonable measures (e.g., compare photo-identifications) to avoid repeated sampling of any individual.

ll. Researchers must not attempt to biopsy or tag a cetacean anywhere forward of the pectoral fin.

mm. Researchers must use sterile[20] biopsy tips and tag dart/barbs.

i. If the biopsy tip or tag anchors becomes contaminated and is no longer sterile (e.g., missed attempt, contacts seawater, physical contact) prior to use, a new sterile biopsy tip or tag anchors must be used.

iv. If a new, sterile biopsy tip is not available, the contaminated tip must be completely cleaned and disinfected[21] following the protocol described in the application (including a 20 minute soak in 10% sodium hypochlorite (bleach) bath or 40 minutes in a cetylcide bath).

v. If new sterile tag anchors are not available, the researcher should cease tagging efforts until sterile alternatives are available.

Non-target Species

nn. To minimize disturbance of Hawaiian monk seals:

i. Do not enter the water when monk seals are present, and if approached by a seal, leave the area.

ii. Report any opportunistic monk seal sightings to the NMFS Pacific Islands Fisheries Science Center, Hawaiian Monk Seal Research

[20] Sterilization = destroys or eliminates all forms of microbial life and is carried out by physical or chemical methods (CDC 2008). These methods should follow the IACUC-approved protocol for sterilization (e.g., gas).
[21] Disinfection= eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects usually by liquid chemicals (CDC 2008).

Program, NOAA IRC, 1845 WASP Blvd, Building 176, Honolulu, HI 96818.

iii. In the main Hawaiian Islands: Tracy Mercer; Tracy.Mercer@noaa.gov; phone (808)725-5718; fax (808)725-5567.

iv. In the Northwestern Hawaiian Islands: Thea Johanos; Thea.Johanos-Kam@noaa.gov; phone (808)725-5709; fax (808)725-5567.

6. The Permit Holder must comply with the following conditions and the regulations at 50 CFR 216.37, for biological samples acquired or possessed under authority of this permit.

i. The Permit Holder is ultimately responsible for compliance with this permit and applicable regulations related to the samples unless the samples are permanently transferred according to NMFS regulations governing the taking and importing of marine mammals (50 CFR 216.37) and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR 222.308).

j. Samples must be maintained according to accepted curatorial standards and must be labeled with a unique identifier (e.g., alphanumeric code) that is connected to on-site records with information identifying the

i. species and, where known, age and sex;

ii. date of collection, acquisition, or import;

iii. type of sample (e.g., skin, blubber);

iv. origin (i.e., where collected or imported from); and

v. legal authorization for original sample collection or import.

k. Biological samples belong to the Permit Holder and may be temporarily transferred to Authorized Recipients identified in Appendix 2 without additional written authorization, for analysis or curation related to the objectives of this permit. The Permit Holder remains responsible for the samples, including any reporting requirements.

l. The Permit Holder may request approval of additional Authorized Recipients for analysis and curation of samples related to the permit objectives by submitting a written request to the Permits Division specifying the

v. name and affiliation of the recipient;

vi. address of the recipient;

vii. types of samples to be sent (species, tissue type); and

viii. type of analysis or whether samples will be curated.

m. The Permit Holder may grant written approval to additional Authorized Recipients for analysis and curation of samples related to the permit objectives. The Permit Holder must maintain a record of the transfer including:

v. name and affiliation of the recipient;

vi. address of the recipient;

vii. types of samples sent (species, tissue type); and

viii. type of analysis or whether samples will be curated.

n. Sample recipients must have authorization pursuant to 50 CFR 216.37 prior to permanent transfer of samples and transfers for purposes not related to the objectives of this permit.

o. Samples cannot be bought or sold, including parts transferred pursuant to 50 CFR 216.37.

p. After meeting the permitted objectives, the Permit Holder may continue to possess and use samples acquired under this permit, without additional written authorization, provided the samples are maintained as specified in the permit and findings are discussed in the annual reports (See Condition E. 3).

C. Qualifications, Responsibilities, and Designation of Personnel

1. At the discretion of the Permit Holder, the following Researchers may participate in the conduct of the permitted activities in accordance with their qualifications and the limitations specified herein:

a. Principal Investigator – Erin Oleson.

b. Co-Investigator(s) – See Appendix 2 for list of names and corresponding activities.

c. Research Assistants – personnel identified by the Permit Holder or Principal Investigator and qualified to act pursuant to Conditions C.2, C.3, and C.4 of this permit.

2. Individuals conducting permitted activities must possess qualifications commensurate with their roles and responsibilities. The roles and responsibilities of personnel operating under this permit are as follows:

a. The Permit Holder is ultimately responsible for activities of individuals operating under the authority of this permit. Where the Permit Holder is an institution/facility, the Responsible Party is the person at the institution/facility who is responsible for the supervision of the Principal Investigator.

b. The Principal Investigator (PI) is the individual primarily responsible for the taking, import, export and related activities conducted under the permit. This includes coordination of field activities of all personnel working under the permit. The PI must be on site during activities conducted under this permit unless a Co-Investigator named in Condition C.1 is present to act in place of the PI.

c. Co-Investigators (CIs) are individuals who are qualified to conduct activities authorized by the permit, for the objectives described in the application, without the on-site supervision of the PI. CIs assume the role and responsibility of the PI in the PI's absence.

d. Research Assistants (RAs) are individuals who work under the direct and on-site supervision of the PI or a CI. RAs cannot conduct permitted activities in the absence of the PI or a CI.

3. Personnel involved in permitted activities must be reasonable in number and essential to conduct of the permitted activities. Essential personnel are limited to

a. individuals who perform a function directly supportive of and necessary to the permitted activity (including operation of vessels or aircraft essential to conduct of the activity),

b. individuals included as backup for those personnel essential to the conduct of the permitted activity, and

c. individuals included for training purposes.

4. Persons who require state or Federal licenses or authorizations (e.g., UAS operators) to conduct activities under the permit must be duly licensed/authorized and follow all applicable requirements when undertaking such activities.

5. Permitted activities may be conducted aboard vessels or aircraft, or in cooperation with individuals or organizations, engaged in commercial activities, provided the commercial activities are not conducted simultaneously with the permitted activities.

7. The Permit Holder cannot require or receive direct or indirect compensation from a person approved to act as PI, CI, or RA under this permit in return for requesting such approval from the Permits Division.

7. The Permit Holder or PI may designate additional CIs without prior approval from the Chief, Permits Division provided

c. A copy of the letter designating the individual and specifying their duties under the permit is forwarded to the Permits Division by facsimile or email on the day of designation.

d. The copy of the letter is accompanied by a summary of the individual's qualifications to conduct and supervise the permitted activities.

c. The Permit Holder acknowledges that the designation is subject to review and revocation by the Chief, Permits Division.

10. Where the Permit Holder is an institution/facility, the Responsible Party may request a change of PI by submitting a request to the Chief, Permits Division that includes a description of the individual's qualifications to conduct and oversee the activities authorized under this permit.

11. Submit requests to add CIs or change the PI by one of the following:

d. the online system at https://apps.nmfs.noaa.gov;

e. an email attachment to the permit analyst for this permit; or

f. a hard copy mailed or faxed to the Chief, Permits Division, Office of Protected Resources, NMFS, 1315 East-West Highway, Room 13705, Silver Spring, MD 20910; phone (301)427-8401; fax (301)713-0376.

D. Possession of Permit

1. This permit cannot be transferred or assigned to any other person.

2. The Permit Holder and persons operating under the authority of this permit must possess a copy of this permit when

d. Engaged in a permitted activity.

e. A protected species is in transit incidental to a permitted activity.

f. A protected species taken or imported under the permit is in the possession of such persons.

3. A duplicate copy of this permit must accompany or be attached to the container, package, enclosure, or other means of containment in which a protected species or protected species part is placed for purposes of storage, transit, supervision or care.

E. Reporting

4. The Permit Holder must submit incident, annual, and final reports containing the information and in the format specified by the Permits Division.

a. Reports must be submitted to the Permits Division by one of the following:

iv. the online system at https://apps.nmfs.noaa.gov;

v. an email attachment to the permit analyst for this permit; or

vi. a hard copy mailed or faxed to the Chief, Permits Division.

c. You must contact your permit analyst for a reporting form if you do not submit reports through the online system.

5. Incident Reporting

d. If authorized takes have been exceeded as specified in Conditions A.2 and B.1, the Permit Holder must

iv. Contact the Permits Division by phone (301-427-8401) as soon as possible, but no later than 2 business days of the incident;

v. Submit a written report within 2 weeks of the incident as specified below; and

vi. Receive approval from the Permits Division before resuming work. The Permits Division may grant authorization to resume permitted activities based on review of the incident report and in consideration of the Terms and Conditions of this permit.

e. Any time a serious injury or mortality of a protected species occurs, a written report must be submitted within two weeks.

f. The incident report must include (1) a complete description of the events and (2) identification of steps that will be taken to reduce the potential for additional serious injury and research-related mortality or exceeding authorized take.

6. Annual reports describing activities conducted during the previous permit year (from January 1 to December 31) must

a. be submitted by March 31st each year for which the permit is valid, and

b. include a tabular accounting of takes and a narrative description of activities and effects.

4. A final report summarizing activities over the life of the permit must be submitted by (November 30, 2022), or, if the research concludes prior to permit expiration, within 180 days of completion of the research.

5. Research results must be published or otherwise made available to the scientific community in a reasonable period of time. Copies of technical reports, conference abstracts, papers, or publications resulting from permitted research must be submitted the Permits Division.

F. Notification and Coordination

1. NMFS Regional Offices are responsible for ensuring coordination of the timing and location of all research activities in their areas to minimize unnecessary duplication, harassment, or other adverse impacts from multiple researchers.

4. The Permit Holder must ensure written notification of planned field work for each project is provided to the NMFS Regional Office listed below at least two weeks prior to initiation of each field trip/season.

c. Notification must include the

i. locations of the intended field study and/or survey routes;

ii. estimated dates of activities; and

iii. number and roles of participants (for example: PI, CI, boat driver, safety diver, Research Assistant "in training").

d. Notification must be sent to the following Assistant Regional Administrator for Protected Resources:

Pacific Islands Region, NMFS, 1845 Wasp Blvd., Building 176, Honolulu, HI 96818; phone (808)725-5000; fax (808)973-2941

Email *(preferred)*: nmfs.pir.research.notification@noaa.gov.

5. Researchers must coordinate their activities with other permitted researchers to avoid unnecessary disturbance of animals or duplication of efforts. Contact the Regional Office listed above for information about coordinating with other Permit Holders.

G. Observers and Inspections

1. NMFS may review activities conducted under this permit. At the request of NMFS, the Permit Holder must cooperate with any such review by

a. allowing an employee of NOAA or other person designated by the Director, NMFS Office of Protected Resources to observe permitted activities; and

b. providing all documents or other information relating to the permitted activities.

H. Modification, Suspension, and Revocation

1. Permits are subject to suspension, revocation, modification, and denial in accordance with the provisions of subpart D [Permit Sanctions and Denials] of 15 CFR part 904.

2. The Director, NMFS Office of Protected Resources may modify, suspend, or revoke this permit in whole or in part

a. in order to make the permit consistent with a change made after the date of permit issuance with respect to applicable regulations prescribed under section 103 of the MMPA and section 4 of the ESA;

b. in a case in which a violation of the terms and conditions of the permit is found;

c. in response to a written request[22] from the Permit Holder;

d. if NMFS determines that the application or other information pertaining to the permitted activities (including, but not limited to, reports pursuant to Section E of this permit and information provided to NOAA personnel pursuant to Section G of this permit) includes false information; and

e. if NMFS determines that the authorized activities will operate to the disadvantage of threatened or endangered species or are otherwise no longer consistent with the purposes and policy in section 2 of the ESA.

[22] The Permit Holder may request changes to the permit related to: the objectives or purposes of the permitted activities; the species or number of animals taken; and the location, time, or manner of taking or importing protected species. Such requests must be submitted in writing to the Permits Division in the format specified in the application instructions.

3. Issuance of this permit does not guarantee or imply that NMFS will issue or approve subsequent permits or amendments for the same or similar activities requested by the Permit Holder, including those of a continuing nature.

I. Penalties and Permit Sanctions

1. A person who violates a provision of this permit, the MMPA, ESA, or the regulations at 50 CFR 216 and 50 CFR 222-226 is subject to civil and criminal penalties, permit sanctions, and forfeiture as authorized under the MMPA, ESA, and 15 CFR part 904.

2. The NMFS Office of Protected Resources shall be the sole arbiter of whether a given activity is within the scope and bounds of the authorization granted in this permit.

c. The Permit Holder must contact the Permits Division for verification before conducting the activity if they are unsure whether an activity is within the scope of the permit.

d. Failure to verify, where the NMFS Office of Protected Resources subsequently determines that an activity was outside the scope of the permit, may be used as evidence of a violation of the permit, the MMPA, the ESA, and applicable regulations in any enforcement actions.

J. Acceptance of Permit

1. In signing this permit, the Permit Holder

a. agrees to abide by all terms and conditions set forth in the permit, all restrictions and relevant regulations under 50 CFR Parts 216, and 222-226, and all restrictions and requirements under the MMPA, and the ESA;

b. acknowledges that the authority to conduct certain activities specified in the permit is conditional and subject to authorization by the Office Director; and

c. acknowledges that this permit does not relieve the Permit Holder of the responsibility to obtain any other permits, or comply with any other Federal, State, local, or international laws or regulations.

Donna S. Wieting

Director, Office of Protected Resources

National Marine Fisheries Service

Date Issued

Evan Howell, Ph.D.

Deputy Director

Pacific Islands Fisheries Science Center

National Marine Fisheries Office

Responsible Party

Date Effective

Appendix 1: Table Specifying the Kinds of Protected Species, Location, and Manner of Taking. Takes for cetacean research in U.S. EEZ waters and those including Hawaiian archipelago, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, Kingman Reef, Palmyra Atoll, Johnston Atoll, Wake Atoll, Howland Island, Baker Island, and Jarvis Island. International waters, and foreign waters, subject to permission of the sovereign host State.

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
1	Dolphin, bottlenose	Range-wide	All	Male and Female	5000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS, includes Indo-Pacific bottlenose dolphin, Tursiops aduncus
2	Dolphin, bottlenose	Range-wide	All	Male and Female	5000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities: includes Indo-Pacific bottlenose dolphin, Tursiops aduncus
3	Dolphin, bottlenose	Range-wide	Adult/ Juvenile	Male and Female	250	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy: includes Indo-Pacific bottlenose dolphin, Tursiops aduncus
4	Dolphin, bottlenose	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy: intended for calves 1 year or older; includes the Indo-Pacific bottlenose dolphin, Tursiops aduncus
5	Dolphin, bottlenose	Range-wide	Adult/ Juvenile	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one suction-cup tag per animal at a time; includes Indo-Pacific bottlenose dolphin, Tursiops aduncus
6	Dolphin, bottlenose	Range-wide	Adult/ Juvenile	Male and Female	40	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 8 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag; includes Indo-Pacific bottlenose dolphin, Tursiops aduncus
7	Dolphin, bottlenose	Range-wide	All	Male and Female	450	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	includes Indo-Pacific bottlenose dolphin, Tursiops aduncus;

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
										Primarily import into U.S. from sea
8	Dolphin, common, long-beaked	Range-wide	All	Male and Female	5000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial survey: manned or UAS
9	Dolphin, common, long-beaked	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
10	Dolphin, common, long-beaked	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
11	Dolphin, common, long-beaked	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy: intended for calves 1 year or older
12	Dolphin, common, long-beaked	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
13	Dolphin, common, long-beaked	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
14	Dolphin, common, long-beaked	Range-wide	All	Male and Female	200	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
15	Dolphin, common, short-beaked	Range-wide	All	Male and Female	5000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial survey: manned or UAS
16	Dolphin, common, short-beaked	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
17	Dolphin, common, short-beaked	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id;	Biopsy

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy	
18	Dolphin, common, short-beaked	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy: calves 1 year or older
19	Dolphin, common, short-beaked	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
20	Dolphin, common, short-beaked	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
21	Dolphin, common, short-beaked	Range-wide	All	Male and Female	200	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
22	Dolphin, Fraser's	Range-wide	All	Male and Female	1000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial survey: manned or UAS
23	Dolphin, Fraser's	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
24	Dolphin, Fraser's	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
25	Dolphin, Fraser's	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy: calves 1 year or older
26	Dolphin, Fraser's	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
27	Dolphin, Fraser's	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 3 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
28	Dolphin, Fraser's	Range-wide	All	Male and Female	150	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
29	Dolphin, northern right whale	Range-wide	All	Male and Female	5000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial survey: manned or UAS
30	Dolphin, northern right whale	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
31	Dolphin, northern right whale	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
32	Dolphin, northern right whale	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy calves: 1 year or older
33	Dolphin, northern right whale	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
34	Dolphin, northern right whale	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
35	Dolphin, northern right whale	Range-wide	All	Male and Female	200	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
36	Dolphin, Pacific white-sided	Range-wide	All	Male and Female	5000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial survey: manned or UAS

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
37	Dolphin, Pacific white-sided	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
38	Dolphin, Pacific white-sided	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
39	Dolphin, Pacific white-sided	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy calves 1 year or older
40	Dolphin, Pacific white-sided	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Incidental harassment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Other; Photo-id; Sample, skin and blubber biopsy; Tracking	Biopys and Tag (suction): one tag per animal at a time
41	Dolphin, Pacific white-sided	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
42	Dolphin, Pacific white-sided	Range-wide	All	Male and Female	200	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
43	Dolphin, pantropical spotted	Range-wide	All	Male and Female	20000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
44	Dolphin, pantropical spotted	Range-wide	All	Male and Female	10000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
45	Dolphin, pantropical spotted	Range-wide	Adult/ Juvenile	Male and Female	250	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
46	Dolphin, pantropical spotted	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id;	Biopsy calves 1 year or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy	
47	Dolphin, pantropical spotted	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
48	Dolphin, pantropical spotted	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 3 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
49	Dolphin, pantropical spotted	Range-wide	All	Male and Female	900	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
50	Dolphin, Risso's	Range-wide	All	Male and Female	2000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
51	Dolphin, Risso's	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
52	Dolphin, Risso's	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
53	Dolphin, Risso's	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy calves 1 year or older
54	Dolphin, Risso's	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
55	Dolphin, Risso's	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR);	Biopsy and Tagging: up to 3 animals may have 1 dart/barb tag & 1 suction cup tag at the same time;

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	other animals receive one dart/barb tag
56	Dolphin, Risso's	Range-wide	All	Male and Female	180	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
57	Dolphin, rough-toothed	Range-wide	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
58	Dolphin, rough-toothed	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
59	Dolphin, rough-toothed	Range-wide	Adult/ Juvenile	Male and Female	100	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
60	Dolphin, rough-toothed	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy, calves 1 year or older
61	Dolphin, rough-toothed	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
62	Dolphin, rough-toothed	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 3 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
63	Dolphin, rough-toothed	Range-wide	All	Male and Female	180	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
64	Dolphin, spinner	Range-wide	All	Male and Female	20000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
65	Dolphin, spinner	Range-wide	All	Male and Female	10000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey;	Level B activities

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Observations, behavioral; Photo-id; Sample, fecal	
66	Dolphin, spinner	Range-wide	Adult/ Juvenile	Male and Female	150	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
67	Dolphin, spinner	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy, calves 1 year or older
68	Dolphin, spinner	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
69	Dolphin, spinner	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
70	Dolphin, spinner	Range-wide	All	Male and Female	460	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
71	Dolphin, striped	Range-wide	All	Male and Female	5000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
72	Dolphin, striped	Range-wide	All	Male and Female	2500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
73	Dolphin, striped	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
74	Dolphin, striped	Range-wide	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Incidental harassment; Observations, behavioral; Other; Photo-id; Sample, skin and blubber biopsy	Biopsy, calves 1 year or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
75	Dolphin, striped	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
76	Dolphin, striped	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
77	Dolphin, striped	Range-wide	All	Male and Female	150	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
78	Dolphin, unidentified	NA	All	Male and Female	1000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS, includes 'blackfish'
79	Dolphin, unidentified	NA	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities, includes 'blackfish'
80	Dolphin, unidentified	NA	Adult/ Juvenile	Male and Female	50	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy, includes 'blackfish
81	Dolphin, unidentified	NA	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy, calves 1 year or older, includes 'blackfish'
82	Dolphin, unidentified	NA	All	Male and Female	100	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Includes 'blackfish'; Primarily import into U.S. from sea
83	Whale, Baird's beaked	Range-wide	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
84	Whale, Baird's beaked	Range-wide	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
85	Whale, Baird's beaked	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id;	Biopsy

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy	
86	Whale, Baird's beaked	Range-wide	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy, calves 1 year or older
87	Whale, Baird's beaked	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
88	Whale, Baird's beaked	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 3 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
89	Whale, Baird's beaked	Range-wide	All	Male and Female	200	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
90	Whale, Blainville's beaked	Range-wide	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
91	Whale, Blainville's beaked	Range-wide	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
92	Whale, Blainville's beaked	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
93	Whale, Blainville's beaked	Range-wide	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy, calves 1 year or older
94	Whale, Blainville's beaked	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Incidental harassment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Other;	Biopsy and Tag (suction): one tag per animal at a time

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Photo-id; Sample, skin and blubber biopsy; Tracking	
95	Whale, Blainville's beaked	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time, calves 1 year or older
96	Whale, Blainville's beaked	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
97	Whale, Blainville's beaked	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older
98	Whale, Blainville's beaked	Range-wide	All	Male and Female	100	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
99	Whale, blue	Range-wide (NMFS Endangered)	All	Male and Female	250	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
100	Whale, blue	Range-wide (NMFS Endangered)	All	Male and Female	250	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
101	Whale, blue	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
102	Whale, blue	Range-wide (NMFS Endangered)	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
103	Whale, blue	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral;	Biopsy and Tag (suction): one tag per animal at a time

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
104	Whale, blue	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 6 months or older
105	Whale, blue	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
106	Whale, blue	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 6 months or older
107	Whale, blue	Range-wide (NMFS Endangered)	All	Male and Female	150	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
108	Whale, Bryde's	Range-wide	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
109	Whale, Bryde's	Range-wide	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
110	Whale, Bryde's	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
111	Whale, Bryde's	Range-wide	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
112	Whale, Bryde's	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral;	Biopsy and Tag (suction): one tag per animal at a time

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
113	Whale, Bryde's	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 6 months or old
114	Whale, Bryde's	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
115	Whale, Bryde's	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 6 months or older
116	Whale, Bryde's	Range-wide	All	Male and Female	150	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
117	Whale, Cuvier's beaked	Range-wide	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
118	Whale, Cuvier's beaked	Range-wide	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
119	Whale, Cuvier's beaked	Range-wide	Adult/ Juvenile	Male and Female	40	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
120	Whale, Cuvier's beaked	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
121	Whale, Cuvier's beaked	Range-wide	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral;	Biopsy and Tag (suction): one tag per animal at a time

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
122	Whale, Cuvier's beaked	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
123	Whale, Cuvier's beaked	Range-wide	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 5 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
124	Whale, Cuvier's beaked	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older
125	Whale, Cuvier's beaked	Range-wide	All	Male and Female	100	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
126	Whale, Deraniyagala's beaked	Range-wide	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
127	Whale, Deraniyagala's beaked	Range-wide	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
128	Whale, Deraniyagala's beaked	Range-wide	Adult/ Juvenile	Male and Female	40	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
129	Whale, Deraniyagala's beaked	Range-wide	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
130	Whale, Deraniyagala's beaked	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Incidental harassment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Other;	Biopsy and Tag (suction): one tag per animal at a time

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Photo-id; Sample, skin and blubber biopsy; Tracking	
131	Whale, Deraniyagala's beaked	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
132	Whale, Deraniyagala's beaked	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 3 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
133	Whale, Deraniyagala's beaked	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older
134	Whale, Deraniyagala's beaked	Range-wide	All	Male and Female	100	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
135	Whale, dwarf sperm	Range-wide	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
136	Whale, dwarf sperm	Range-wide	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
137	Whale, dwarf sperm	Range-wide	Adult/ Juvenile	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
138	Whale, dwarf sperm	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
139	Whale, dwarf sperm	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral;	Biopsy and Tag (suction): one tag per animal at a time

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
140	Whale, dwarf sperm	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
141	Whale, dwarf sperm	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
142	Whale, dwarf sperm	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older
143	Whale, dwarf sperm	Range-wide	All	Male and Female	50	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
144	Whale, false killer	Hawaii Insular (NMFS Endangered)	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
145	Whale, false killer	Hawaii Insular (NMFS Endangered)	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
146	Whale, false killer	Hawaii Insular (NMFS Endangered)	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
147	Whale, false killer	Hawaii Insular (NMFS Endangered)	Calf	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
148	Whale, false killer	Hawaii Insular (NMFS Endangered)	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
149	Whale, false killer	Hawaii Insular (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
150	Whale, false killer	Hawaii Insular (NMFS Endangered)	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 5 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
151	Whale, false killer	Hawaii Insular (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older
152	Whale, false killer	Range-wide	All	Male and Female	1000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
153	Whale, false killer	Range-wide	All	Male and Female	1500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
154	Whale, false killer	Range-wide	Adult/ Juvenile	Male and Female	200	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
155	Whale, false killer	Range-wide	Calf	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
156	Whale, false killer	Range-wide	Adult/ Juvenile	Male and Female	35	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
157	Whale, false killer	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral;	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
158	Whale, false killer	Range-wide	Adult/ Juvenile	Male and Female	50	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 12 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
159	Whale, false killer	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older
160	Whale, false killer	Range-wide	All	Male and Female	250	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
161	Whale, fin	Range-wide (NMFS Endangered)	All	Male and Female	250	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
162	Whale, fin	Range-wide (NMFS Endangered)	All	Male and Female	250	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
163	Whale, fin	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
164	Whale, fin	Range-wide (NMFS Endangered)	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
165	Whale, fin	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
166	Whale, fin	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral;	Biopsy and Tag (suction): one tag per animal at a time; calves 6 months or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
167	Whale, fin	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 5 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
168	Whale, fin	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 6 months or older
169	Whale, fin	Range-wide (NMFS Endangered)	All	Male and Female	150	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
170	Whale, ginkgo-toothed beaked	Range-wide	All	Male and Female	2000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
171	Whale, ginkgo-toothed beaked	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
172	Whale, ginkgo-toothed beaked	Range-wide	Adult/ Juvenile	Male and Female	150	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
173	Whale, ginkgo-toothed beaked	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
174	Whale, ginkgo-toothed beaked	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
175	Whale, ginkgo-toothed beaked	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral;	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time;

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	other animals receive one dart/barb tag
176	Whale, ginkgo-toothed beaked	Range-wide	All	Male and Female	200	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
177	Whale, humpback	Range-wide	All	Male and Female	1000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
178	Whale, humpback	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Underwater photo/videography	Level B activities
179	Whale, humpback	Range-wide	Adult/ Juvenile	Male and Female	100	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
180	Whale, humpback	Range-wide	Calf	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Incidental harassment; Observations, behavioral; Other; Photo-id; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
181	Whale, humpback	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
182	Whale, humpback	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 6 months or older
183	Whale, humpback	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
184	Whale, humpback	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id;	Biopsy and Tag (dart/barb): one tag per animal at a time;

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy; Tracking	calves 6 months or older
185	Whale, humpback	Range-wide	All	Male and Female	250	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
186	Whale, humpback	Western North Pacific Stock (NMFS Endangered)	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
187	Whale, humpback	Western North Pacific Stock (NMFS Endangered)	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Underwater photo/videography	Level B activities
188	Whale, humpback	Western North Pacific Stock (NMFS Endangered)	Adult/ Juvenile	Male and Female	100	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
189	Whale, humpback	Western North Pacific Stock (NMFS Endangered)	Non-neonate	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves of any age (excluding neonates). See text for justification.
190	Whale, humpback	Western North Pacific Stock (NMFS Endangered)	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
191	Whale, humpback	Western North Pacific Stock (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 6 months or older
192	Whale, humpback	Western North Pacific Stock (NMFS Endangered)	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 3 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
193	Whale, humpback	Western North Pacific Stock (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id;	Biopsy and Tag (dart/barb): one tag per animal at a time;

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy; Tracking	calves 6 months or older
194	Whale, humpback	Western North Pacific Stock (NMFS Endangered)	All	Male and Female	250	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
195	Whale, killer	Range-wide	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
196	Whale, killer	Range-wide	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
197	Whale, killer	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
198	Whale, killer	Range-wide	Calf	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
199	Whale, killer	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
200	Whale, killer	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
201	Whale, killer	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
202	Whale, killer	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id;	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
203	Whale, killer	Range-wide	All	Male and Female	150	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
204	Whale, Longman's beaked	Range-wide	All	Male and Female	600	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
205	Whale, Longman's beaked	Range-wide	All	Male and Female	600	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
206	Whale, Longman's beaked	Range-wide	Adult/ Juvenile	Male and Female	100	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
207	Whale, Longman's beaked	Range-wide	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
208	Whale, Longman's beaked	Range-wide	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
209	Whale, Longman's beaked	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
210	Whale, Longman's beaked	Range-wide	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 5 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
211	Whale, Longman's beaked	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id;	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
212	Whale, Longman's beaked	Range-wide	All	Male and Female	100	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
213	Whale, melon-headed	Range-wide	All	Male and Female	5000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
214	Whale, melon-headed	Range-wide	All	Male and Female	5000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
215	Whale, melon-headed	Range-wide	Adult/ Juvenile	Male and Female	150	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
216	Whale, melon-headed	Range-wide	Calf	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
217	Whale, melon-headed	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
218	Whale, melon-headed	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
219	Whale, melon-headed	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
220	Whale, melon-headed	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id;	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
221	Whale, melon-headed	Range-wide	All	Male and Female	200	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
222	Whale, minke	Range-wide	All	Male and Female	250	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
223	Whale, minke	Range-wide	All	Male and Female	250	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
224	Whale, minke	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
225	Whale, minke	Range-wide	Calf	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
226	Whale, minke	Range-wide	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
227	Whale, minke	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 6 months or older
228	Whale, minke	Range-wide	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 5 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
229	Whale, minke	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id;	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 6 months or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
230	Whale, minke	Range-wide	All	Male and Female	150	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
231	Whale, pilot, short-finned	Range-wide	All	Male and Female	5000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
232	Whale, pilot, short-finned	Range-wide	All	Male and Female	2500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
233	Whale, pilot, short-finned	Range-wide	Adult/ Juvenile	Male and Female	200	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
234	Whale, pilot, short-finned	Range-wide	Calf	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
235	Whale, pilot, short-finned	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
236	Whale, pilot, short-finned	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
237	Whale, pilot, short-finned	Range-wide	Adult/ Juvenile	Male and Female	35	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
238	Whale, pilot, short-finned	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id;	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
239	Whale, pilot, short-finned	Range-wide	All	Male and Female	200	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
240	Whale, pygmy killer	Range-wide	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
241	Whale, pygmy killer	Range-wide	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
242	Whale, pygmy killer	Range-wide	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
243	Whale, pygmy killer	Range-wide	Calf	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
244	Whale, pygmy killer	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
245	Whale, pygmy killer	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
246	Whale, pygmy killer	Range-wide	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
247	Whale, pygmy killer	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id;	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
248	Whale, pygmy killer	Range-wide	All	Male and Female	125	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
249	Whale, pygmy sperm	Range-wide	All	Male and Female	50	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
250	Whale, pygmy sperm	Range-wide	All	Male and Female	100	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
251	Whale, pygmy sperm	Range-wide	Adult/ Juvenile	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
252	Whale, pygmy sperm	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
253	Whale, pygmy sperm	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
254	Whale, pygmy sperm	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 1 year or older
255	Whale, pygmy sperm	Range-wide	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
256	Whale, pygmy sperm	Range-wide	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 1 year or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
257	Whale, pygmy sperm	Range-wide	All	Male and Female	50	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
258	Whale, right, North Pacific	Range-wide (NMFS Endangered)	All	Male and Female	40	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
259	Whale, right, North Pacific	Range-wide (NMFS Endangered)	All	Male and Female	50	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
260	Whale, right, North Pacific	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
261	Whale, right, North Pacific	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
262	Whale, right, North Pacific	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
263	Whale, right, North Pacific	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 6 months or older
264	Whale, right, North Pacific	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
265	Whale, right, North Pacific	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 6 months or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
266	Whale, right, North Pacific	Range-wide (NMFS Endangered)	All	Male and Female	30	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
267	Whale, sei	Range-wide (NMFS Endangered)	All	Male and Female	250	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
268	Whale, sei	Range-wide (NMFS Endangered)	All	Male and Female	250	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
269	Whale, sei	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	75	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
270	Whale, sei	Range-wide (NMFS Endangered)	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
271	Whale, sei	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
272	Whale, sei	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 6 months or older
273	Whale, sei	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 3 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
274	Whale, sei	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 6 months or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
275	Whale, sei	Range-wide (NMFS Endangered)	All	Male and Female	150	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
276	Whale, sperm	Range-wide (NMFS Endangered)	All	Male and Female	1000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
277	Whale, sperm	Range-wide (NMFS Endangered)	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
278	Whale, sperm	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	250	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
279	Whale, sperm	Range-wide (NMFS Endangered)	Calf	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
280	Whale, sperm	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
281	Whale, sperm	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time; calves 6 months or older
282	Whale, sperm	Range-wide (NMFS Endangered)	Adult/ Juvenile	Male and Female	20	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tagging: up to 7 animals may have 1 dart/barb tag & 1 suction cup tag at the same time; other animals receive one dart/barb tag
283	Whale, sperm	Range-wide (NMFS Endangered)	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time; calves 6 months or older

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
284	Whale, sperm	Range-wide (NMFS Endangered)	All	Male and Female	250	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
285	Whale, Stejneger's beaked	Range-wide	All	Male and Female	1000	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
286	Whale, Stejneger's beaked	Range-wide	All	Male and Female	1000	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
287	Whale, Stejneger's beaked	Range-wide	Adult/ Juvenile	Male and Female	100	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
288	Whale, Stejneger's beaked	Range-wide	Calf	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
289	Whale, Stejneger's beaked	Range-wide	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
290	Whale, Stejneger's beaked	Range-wide	Adult/ Juvenile	Male and Female	15	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
291	Whale, Stejneger's beaked	Range-wide	All	Male and Female	200	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
292	Whale, unidentified beaked	NA	All	Male and Female	50	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
293	Whale, unidentified beaked	NA	All	Male and Female	50	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
294	Whale, unidentified beaked	NA	Adult/ Juvenile	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id;	Biopsy

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy	
295	Whale, unidentified beaked	NA	Calf	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Incidental harassment; Observations, behavioral; Other; Photo-id; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
296	Whale, unidentified beaked	NA	All	Male and Female	50	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
297	Whale, unidentified Kogia (dwarf/pygmy sperm)	NA	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
298	Whale, unidentified Kogia (dwarf/pygmy sperm)	NA	All	Male and Female	250	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
299	Whale, unidentified Kogia (dwarf/pygmy sperm)	NA	Adult/ Juvenile	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
300	Whale, unidentified Kogia (dwarf/pygmy sperm)	NA	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy, calves 1 year or older
301	Whale, unidentified Kogia (dwarf/pygmy sperm)	NA	All	Male and Female	50	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
302	Whale, unidentified Mesoplodon	NA	All	Male and Female	500	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
303	Whale, unidentified Mesoplodon	NA	All	Male and Female	500	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
304	Whale, unidentified Mesoplodon	NA	Adult/ Juvenile	Male and Female	25	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id;	Biopsy

Line	Species	Stock/Listing Unit	Lifestage	Sex	Authorized Take	Takes Per Animal	Take Action	Observe/ Collect Method	Procedures	Details
									Sample, fecal ; Sample, skin and blubber biopsy	
305	Whale, unidentified Mesoplodon	NA	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 1 year or older
306	Whale, unidentified Mesoplodon	NA	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (suction): one tag per animal at a time
307	Whale, unidentified Mesoplodon	NA	Adult/ Juvenile	Male and Female	10	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	Biopsy and Tag (dart/barb): one tag per animal at a time
308	Whale, unidentified Mesoplodon	NA	All	Male and Female	50	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea
309	Whale, unidentified rorqual	NA	All	Male and Female	100	1	Harass	Survey, aerial	Count/survey; Photo-id; Photogrammetry; Remote vehicle, aerial (fixed wing); Remote vehicle, aerial (VTOL)	Aerial surveys: manned or UAS
310	Whale, unidentified rorqual	NA	All	Male and Female	150	1	Harass	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal	Level B activities
311	Whale, unidentified rorqual	NA	Adult/ Juvenile	Male and Female	45	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy
312	Whale, unidentified rorqual	NA	Calf	Male and Female	5	1	Harass/ Sampling	Survey, vessel	Acoustic, passive recording; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Sample, fecal ; Sample, skin and blubber biopsy	Biopsy; calves 6 months or older
313	Whale, unidentified rorqual	NA	All	Male and Female	50	99999	Import/ export/ receive only	Survey, vessel	Import/ export/ receive, parts	Primarily import into U.S. from sea

Appendix 2: NMFS-Approved Personnel and Authorized Recipients for Permit No. 20311.

The following individuals are approved to act as Co-Investigators pursuant to the terms and conditions under Section C (Qualifications, Responsibilities, and Designation of Personnel) of this permit.

Name	Level B	Biopsy Sampling	Suction cup Tagging	Dart Tagging	UAS	In-Water Observation
Baird, Robin	Y	Y	Y	Y		
Bradford, Amanda	Y	Y				
Hill, Marie	Y	Y				
Ligon, Allan	Y	Y	Y	Y		
Littnan, Charles	Y				Y	
Lyman, Ed	Y	Y				Y
Oleson, Erin (PI)	Y	Y	Y			
Webster, Daniel	Y	Y	Y	Y		

Biological samples authorized for collection or acquisition in Table 1 of Appendix 1 may be transferred to the following Authorized Recipients for the specified disposition, consistent with Condition B.6 of the permit:

Authorized Recipient	Sample Type	Disposition
Kristi West, Hawaii Pacific University	blood	curation, analysis
Kristi West, Hawaii Pacific University	blubber biopsy	curation, analysis
Kristi West, Hawaii Pacific University	sloughed skin	curation, analysis
Marine Mammal Genetics Group, NOAA Fisheries Southwest Fisheries Science Center	blubber biopsy	curation, analysis
Marine Mammal Genetics Group, NOAA Fisheries Southwest Fisheries Science Center	sloughed skin	curation, analysis
Environmental Assessment Division, Northwest Fisheries Science Center	blubber biopsy	analysis
Environmental Assessment Division, Northwest Fisheries Science Center	sloughed skin	analysis