UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

JUL 16 2012

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act (NEPA), an environmental review has been performed on the following action.

TITLE: Environmental Assessment For Issuance of Four Scientific Research Permits for Cetacean Studies

LOCATION: Eastern North Pacific, from Central America to Alaska

SUMMARY: The proposed action is issuance of a scientific research permit (File No. 16111) for takes of marine mammals during aerial and vessel surveys, photo-identification, underwater photography and videography, collection of sloughed skin and feces, breath sampling, passive acoustic recordings, suction cup and dart tagging, and biopsy sample collection. The purposes of the research are to continue long-term studies designed to examine marine mammal abundance, distribution, population structure, habitat use, social structure, movement patterns, diving behavior, and diet. The research would also assess the impact of human activities such as ship strikes, noise exposure, contaminants, and fishery interactions on marine mammals. Impacts from these activities would be short-term and minimal to individual animals and negligible to the species. A biological opinion concluded that the proposed action would not likely jeopardize the continued existence of the species and would not likely destroy or adversely modify designated critical habitat. The permit would be valid for five years from the date of issuance.

RESPONSIBLE OFFICIAL: Helen M. Golde
Acting Director, Office of Protected Resources
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
1315 East-West Highway, Room 13821
Silver Spring, MD 20910
(301) 427-8400

The environmental review process led us to conclude that this action will not have a significant effect on the human environment. Therefore, an environmental impact statement will not be prepared. A copy of the finding of no significant impact (FONSI) for Permit No. 16111, including the supporting environmental assessment (EA) is enclosed for your information. A FONSI for the other three permits described in the EA was signed on June 4, 2012; a FONSI for Permit No. 16111 could not be completed at that time because details of the permit application had not been submitted in time.

Although NOAA is not soliciting comments on this completed EA/FONSI we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the responsible official named above.

Sincerely,

for
Patricia A. Montanio
NOAA NEPA Coordinator

Enclosure

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

Environmental Assessment
For
Issuance of Four Scientific Research Permits for Cetacean Studies

April 2012

Lead Agency: USDC National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Office of Protected Resources

Responsible Official: Helen M. Golde, Acting Director, Office of Protected Resources

For Further Information Contact: Office of Protected Resources
National Marine Fisheries Service
1315 East West Highway
Silver Spring, MD 20910
(301) 427-8400

Location: Pacific Ocean and inland waters of the U.S.

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue four five-year scientific research permits for takes of marine mammals in the wild, pursuant to 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, as amended (ESA; 16 U.S.C. 1531 et seq.), the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR 222-226), and the Fur Seal Act of 1966 (16 U.S.C. 1151 *et seq.*). Permit Nos. 16163, 16160, 16111, and 15569 would authorize takes of marine mammals during varying combinations of research activities including aerial surveys, vessel surveys for behavioral observations, photo-identification, underwater photography and videography, collection of sloughed skin and feces, sampling whale blows, passive acoustic recordings, suction cup and implantable dart tagging, biopsy sample collection, and acoustic playbacks. The permits would also authorize export and re-import of parts. Specific objectives of each permit applicant vary but ultimately involve the continuation of long-term research on Southern Resident killer whales and other cetacean species.

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1.0 PURPOSE OF AND NEED FOR ACTION

Proposed Action
In response to receipt of requests from applicants, NMFS proposes to issue Scientific Research Permits pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq*.), the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq*.), and the Fur Seal Act of 1966 (16 U.S.C. 1151 *et seq*.) for "takes"[1] of marine mammals, including those listed as threatened or endangered. The applicants and their respective file numbers are:

Principal Investigator	File No.
Northwest Fisheries Science Center (NWFSC)/Brad Hanson, Ph.D.	16163
John Calambokidis	16111
The Center for Whale Research/ Ken Balcomb	15569
The Whale Museum	16160

Purpose of and Need for Action: The MMPA and ESA prohibit "takes" of marine mammals and of threatened and endangered species, respectively, with only a few specific exceptions. The applicable exceptions in this case are an exemption for *bona fide* scientific research under Section 104 of the MMPA and for scientific purposes related to species recovery under Section 10(a)(1)(A) of the ESA.

The purpose of the permits is to provide the applicants with an exemption from the take prohibitions under the MMPA and ESA for harassment (including level A and B harassment as defined under the MMPA[2]) of marine mammals, including those listed as threatened or endangered, during conduct of research that is consistent with the MMPA and ESA issuance criteria.

The need for issuance of these permits is related to the purposes and policies of the MMPA and ESA. NMFS has a responsibility to implement both the MMPA and the ESA to protect, conserve, and recover marine mammals and threatened and endangered species under its jurisdiction. Facilitating research about species' basic biology and ecology or that identifies, evaluates, or resolves specific conservation problems informs NMFS management of protected species.

Other EA/EIS That Influence Scope of this Environmental Assessment: NMFS Permits Division has prepared EAs with Findings of No Significant Impact (FONSI) for issuance of

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

permits to take marine mammals during research involving biopsy, tagging, and playback studies on numerous species of marine mammals.

- *Environmental Assessment on the Effects of the Issuance of Eleven National Marine Fisheries Service Permitted Scientific Research Activities on Marine Mammal and Sea Turtle Species in the U.S. Territorial Waters and High Seas of the North Pacific Ocean (including the Gulf of Alaska and Bering Sea), Arctic Ocean (including the Chukchi Sea and Beaufort Sea), Southern Ocean (including waters off Antarctica), and Foreign Territorial Waters of Mexico (Gulf of California only), Canada, Russia, Japan and the Philippines* (NMFS, 2004).

  This EA described and analyzed the effects of research activities ranging from close approaches during aerial and vessel surveys for photo-identification to biopsy sampling and acoustic playbacks.

- *Supplemental Environmental Assessment on the Effects of the Issuance of Nine National Marine Fisheries Service Permit Actions for Scientific Research Activities on Marine Mammal Species in the U.S. Territorial Waters and High Seas of the Eastern, Central, and Western North Pacific Ocean, with a Primary Focus on the Waters Off Hawaii and from California Northward to Southeast Alaska (Including Gulf of Alaska and Aleutian Islands), and Including Foreign Territorial Waters of Japan* (NMFS, 2005).

  This SEA was prepared to analyze the effects of increased action and cumulative impacts of research on primarily humpbacks, blue, sei, and fin whales in the Pacific basin. These requests cover a subset of the same research methodologies, target species and action area analyzed under the original EA as detailed above.

- *Environmental Assessment on the Effects of the Issuance of Four National Marine Fisheries Service Scientific Research Permits and Three Permit Amendments on the Eastern North Pacific Southern Resident Killer Whale (Orcinus orca) and Other Marine Mammals in the U.S. Territorial Waters, Exclusive Economic Zones, and High Seas of the Eastern North Pacific Ocean along the Coast of the U.S. from Southeastern Alaska to Central California, and Coastal Inlets and Estuaries of These States* (NMFS, 2006a)

  The EA was prepared for issuance of several permits and amendments for research directed at Southern Resident killer whales (SRKW's), and including research on non-ESA listed killer whales and various other marine mammals.

- *Environmental Assessment on the Effects of Scientific Research Activities Associated with Behavioral Response Studies of Pacific Marine Mammals Using Controlled Sound Exposure* (NMFS, 2010)

  This EA described and analyzed the effects of research activities ranging from close approaches during vessel surveys for tagging, photo-identification, biopsy sampling and acoustic playbacks.

- *Environmental Assessment on the Effects of the Issuance of a Scientific Research Permit [File No. 14097] for Pinniped, Cetacean, and Sea Turtle Studies* (NMFS, 2010)

  This EA described and analyzed the effects of research activities ranging from close approaches during aerial and vessel surveys for photo-identification to biopsy sampling and tagging.

- *Environmental Assessment for The Issuance of Scientific Research Permits for Research on Humpback Whales and Other Cetaceans* (NMFS, 2010)

  This EA described and analyzed the effects of aerial surveys, vessel surveys for behavioral observations, photo-identification, underwater photography and videography, collection of sloughed skin and feces, sampling whale blows, passive acoustic recordings, export and re-import of parts, tags attached by suction cup or by implanting darts, barbs, or a portion of the tag into the skin and blubber, biopsy sample collection, and acoustic playbacks.

- *Environmental Assessment for Issuance of a Scientific Research Permit [File No. 15330] for Cetacean Studies* (NMFS, 2011)

  This EA described and analyzed the effects of vessel surveys, aerial surveys, photo-identification, acoustic recording, biological sample collection, and dart and suction cup tagging as well as salvage and import/export of cetacean parts, specimens, and biological samples.

- *Supplemental Environmental Assessment On The Effects Of Issuance Of A Scientific Research Permit Amendment For Research On The Eastern North Pacific Southern Resident Killer Whale (Orcinus Orca) Permit No*. 781-1824-02 (NMFS, 2011)

  This SEA described and analyzed the effects of increased suction cup tagging and addition of implantable tagging of SRKW's .

- *Programmatic Environmental Impact Statement (PEIS) for Research on Steller Sea Lions and Northern Fur Seals* (NMFS 2007)

  This PEIS described and analyzed the effects of research on Steller seal lions and Northern fur seals. In its ROD (signed August 10, 2009) for the Final PEIS, NMFS selected the Preferred Alternative (Alternative 4: Research Program with Full Implementation of Conservation Goals), as the alternative under which permits for research would be issued.

In 2007, NMFS prepared a programmatic Environmental Impact Statement (EIS) for Research on Steller Sea Lions and Northern Fur Seals. The takes of northern fur seals and endangered Western DPS Steller sea lions proposed in the permit application are consistent with the preferred alternative evaluated in the PEIS. In the PEIS analysis, NMFS found that aerial surveys over water for these species of marine mammals may result in short-term minor disruptions in

behavioral patterns and that these disruptions are not life-threatening or otherwise biologically significant to the individual, stock, population, or species. The PEIS analysis is incorporated by reference and this EA does not re-evaluate effects on those species as there is no new information to suggest such an analysis is warranted.

The EAs cited above were prepared to take a closer look at the potential environmental impacts of permitted research on marine mammals listed as threatened or endangered, and not because the Permits Division determined that significant adverse environmental impacts were expected or that a categorical exclusion was not applicable. As each EA demonstrates, and each FONSI has documented, research on marine mammals generally does not have a potential for significant adverse impacts on marine mammal populations or any other component of the environment.

Scope of Environmental Assessment: As the prior EA's listed above have demonstrated, issuance if the permits does not have the potential to adversely affect the physical or biological environment. The scope of this EA is limited to the effects on the marine mammals targeted by permit; primarily the Southern Resident killer whales (*Orcinus orca*), humpback whales (*Megaptera novaeangliae*), blue whales (*Balaenoptera musculus*), fin whales (*B. physalus*), sei whales (*B. borealis*), sperm whales (*Physeter macrocephalus*), North Pacific right whales *(Eubalaena japonica),* Eastern and Western Steller sea lions (*Eumetopias jubatus*), Guadalupe fur seals (*Arctocephalus townsendi*), and Hawaiian Monk seals (*Monachus schauinslandi*) listed as threatened and endangered under the ESA, and one stock proposed for ESA listing, Hawaiian insular false killer whales (*Pseudorca crassidens*).

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

There is no evidence from prior analyses[3] of the effects of permit issuance, or from monitoring reports submitted by permit holders[4], that issuance of research permits for take of marine mammals listed under the ESA results in adverse effects on stocks or species. Nevertheless, NMFS has prepared this EA, with a more detailed analysis of the potential for adverse impacts on threatened or endangered species resulting from takes of a specified number of individual whales or pinnipeds, to assist in making the decision about permit issuance under the MMPA and ESA.

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

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

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Alternative 1- No Action

Under the No Action alternative, Permit Nos. 16163, 16160, 16111, and 15569 would not be issued. The applicants would not receive an exemption from the MMPA and ESA prohibitions against take and it is therefore unlikely they would conduct the research.

Alternative 2 – Proposed Permit

Under the Proposed Action alternative, five-year research permits would be issued for takes of marine mammals. These permits would include terms and conditions standard to such permits as issued by NMFS.

The types of research proposed by each applicant are summarized in Table 1 along with the type of take (Level A or B harassment) that would be permitted as a result; general descriptions of cetacean research methods and the specifics of each permit request follows. The activities listed for each permit in Table 1 would not all be conducted on all species targeted by that researcher. The focus of most research, and therefore the maximum types of taking, varies between applicants. Specific species, take numbers, and activities for each application are listed in Attachment 1.

Table 1. Summary of locations and research methods requested in each application. All activities are not requested for all target species in each permit.

	Location						Level B harassment									Level A harassment			
Applicant	**California**	**Oregon**	**Washington**	**Alaska**	**Hawaii**	**High Seas**	**Aerial Surveys**	**Vessel Surveys**	**Close Vessel Approach, Behavioral Observations, and Photo-ID/Thermal imaging**	**Underwater photo/video**	**Passive Acoustic**	**Collect Breath Samples**	**Active Acoustic/Playback**	**Collect skin/fecal**	**Export/Re-import**	**Ultrasound**	**Suction Cup Tagging**	**Implantable Tagging**	**Biopsy**
NWFSC No. 16163	X	X	X	X	X	X	X	X	X			X *	X **	X	X	X	X	X	X
Calambokidis No. 16111	X	X	X	X		X	X	X	X	X	X	X		X			X	X	X
Balcomb No. 15569	X	X	X	X			X	X	X		X			X					
The Whale Museum No. 16160			X					X	X										

* Breath Sampling includes sampling with a UAV.

** Playback includes active acoustic playback and marine mammal imaging with an echosounder.

General Methods

The research protocols are described in detail in each of the applications[5] on file for the action and are briefly summarized here. General descriptions of protocols are presented followed by more specific information for each applicant's request.

Level B harassment of large whales and small cetaceans would occur during aerial surveys, vessel surveys, ground surveys, behavioral observations, photo-identification activities, underwater photography and videography, passive acoustic recording, marine mammal breath sampling, acoustic playbacks, and marine mammal and prey field imaging with echosounders. Sloughed skin or feces would be collected from the water using a small net. This would only result in Level B harassment if a cetacean is within 100 yards of the vessel.

Aerial surveys
Aerial surveys would be conducted using fixed-wing aircraft, rotary-wing aircraft, lighter than air craft and unmanned aircraft. Aerial surveys using fixed-wing aircraft would generally be conducted at an altitude of above 700 ft, with descents to a minimum of 300 ft for species identification and photo-identification. Helicopters would fly between altitudes of 750-1000 feet. Surveys would not be flown over pinniped haulout sites.

Vessel surveys
Surveys may be conducted during any time of the year, but would be subject to vessel availability. Vessels would range in size up to ~150 ft (50m). Vessel surveys using random routes or line-transect sampling methods would be used to collect data for estimating abundance of cetaceans. During large vessel surveys, three to eight observers would rotate through at least three positions (port and starboard observers and a data recorder) during daylight hours, weather permitting (sea state of Beaufort 0-7 with minimal rain). The naked eye, 7x handheld, or 25x "bigeye" pedestal mounted binoculars would be used to locate marine mammals. The port observer would survey from 10º right to 90º left of the trackline and the starboard observer from 10º left to 90º right of the trackline. The recorder would scan the entire 180º area forward of the ship, focusing primarily on the trackline, using 7x reticled binoculars to confirm sightings.

The ship's global positioning system (GPS) unit or a handheld GPS would interface with a portable computer at the recorder's station. A standardized survey software program such as WinCruz would be used to collect standard line-transect information. The date, time, and position of the vessel would be automatically entered into the survey program every 5 min and whenever data are entered by the recorder. At the start of each trackline, observer positions and environmental conditions would be entered. Environmental conditions include sea state (Beaufort scale), swell height and direction, weather (rain, fog, no rain or fog, both rain and fog), horizontal and vertical positions of the sun, wind speed and visibility. Sighting information includes cue (blow, splash, animal), method (binocular type or naked eye), vertical distance (taken from reticles in the binoculars), angle relative to the ship's heading (from an angle ring on the binocular mount or an angle board), species, and group size (best, high, and low count).

[5] The scientific research permit applications was made available for review on the Applications and Permits for Protected Species (APPS) home page, https://apps.nmfs.noaa.gov and upon written request or by appointment in the respective NMFS Regional offices during the public comment period.

When appropriate, the survey effort would be temporarily suspended to approach a group to facilitate species identification or group-size estimation or to conduct other activities such as photo-identification, acoustic recording, or biopsy sampling before returning to the line transect point where the vessel disengaged and continuing the survey.

Close vessel approach for photo-identification and behavioral observations
Vessels used for photo identification and behavioral observation would generally be less than 14 m in length. For large whales, boat approaches would be within a whale's length from an individual (ca. 10-15 m for an adult-sized whale), although a whale might approach the boat closer than this distance. For small cetaceans, boat approaches would be within 5 m.

Focal animal or group follows would be conducted, during which the behavior of the animal(s) would be recorded, pod composition determined, and behavioral roles identified when possible. Photographs of the tail flukes, dorsal fin shape, and distinctive scars and body markings of each member of a group would be taken. When feasible, behaviors would be videotaped. Observations and photography of the animal(s) would be of variable duration depending on circumstances, behaviors, social dynamics, and weather and water conditions.

During close vessel approaches for all activities (Level A and B harassment), disturbance to animals would be minimized by:

- Approaching at minimal speeds from behind or beside the group.
- Remaining parallel to the animals.
- Matching speed with the group.
- Minimizing changes in speed.
- Terminating activities if active avoidance is occurring.

Underwater photography and videography

Blue, humpback, fin, and gray whales would be approached, observed and filmed underwater to observe behavior, document scarring, and examine presence of remoras and other parasites. Methods of observation would include pole mounted cameras and in-water divers.

Pole- or vessel-mounted camera
Underwater cameras would include devices ranging from a small pole mounted lipstick camera to larger vessel-mounted units that would be considered part of the vessel's superstructure. Very slow approaches or drifting in the vicinity of foraging animals would be conducted to within 5 m of animals to collect underwater video data.

Divers: Snorkel, Scuba, or Rebreathers
One to two divers would approach to within 5 meters of the whale and would remain less than 10 minutes in the water. Approaches would be terminated if repeated avoidance behavior was observed.

Remote measuring/ Photogrammetry (aerial and laser techniques)

Photogrammetry is the technique of measuring objects (2D or 3D) from photo-grammes. These are commonly photographs but may also be imagery stored electronically on tape or disk taken

by video cameras, charge-coupled device cameras or radiation sensors such as scanners. Images are generally taken from a high-speed aircraft flying at low altitudes. The camera is mounted in the belly of the aircraft and takes large-format, motion-compensated photographs. For these research activities, altitudes between 750-1000 feet altitude are identified in the application for this technique. Photogrammetry techniques can also be used from vessels and most often in conjunction with photo-identification.

Passive acoustic recording
Hydrophones or hydrophone arrays would be used for acoustic recordings of marine mammals. Generally, recordings would be of individuals already approached for behavioral observation and photo-identification or those encountered during line transect surveys. The vessel would not approach closer than 100 meters when towing an array.

Breath sampling
Breath samples for health assessment would be collected using a pole system or Unmanned Aerial Vehicle (UAV).

Pole system
The breath sampling device would be mounted on a long pole and would consist of a specially designed vacuum cylinder, a system previously used on several species (Rasmussen and Riddle 2004), algal culture plates, or nylon mesh. An algal culture plate inside the funnel would be used for bacterial cultures of the breath. Samples would be collected from free ranging whales by positioning a funnel at the end of a 6m pole (which is connected to the vacuum cylinder with plastic tubing) over the blowhole of the surfacing animal whose exhalation would manually open the cylinder valve for collection. The sampling equipment is not intended to touch the animal although in certain rare circumstances there could be brief (< 1 sec) contact.

UAV
The breath sampling device would be mounted on the remote controlled helicopter and consist of algal culture plates placed inside a funnel. The UAV would be maneuvered by an experienced operator and would be maneuvered to no less than 3 meters from the whale's blowhole and would remain above the dorsal fin height of a whale.

Acoustic playbacks
Playbacks would be conducted to determine whether particular classes of sounds evoke a mild alerting response in some large whale and small cetacean species. Sounds that cause mild alert responses could be used in the future to avoid vessel collisions, seismic exploration activities, and gear entanglements. A variety of sound types would be broadcast to tagged and untagged animals to determine their behavioral reactions. A ramping up procedure in which received levels are initially set to about 10 dB below the current generic acoustic thresholds would be increased in 5-10 dB steps until a behavioral response is observed or until the researchers reach a maximum level of 180 dB rms. Sound levels received by target species would not exceed 180 dB re: 1µPa, NMFS' and are not likely to exceed Level B harassment or result in injury or mortality.

Playbacks would include:

- Simulated industrial sounds

- Control sounds including those naturally occurring, white noise, and other backgrounds signals.

Imaging marine mammals and prey with echosounders
Commercially available echosounders would be used to investigate the feasibility of using echosounder pulses for imaging and monitoring killer whales and other marine mammals. The operational range of echosounders used for imaging would likely be greater than 10m but shorter 500m.

Echosounders would also be used in the vicinity of marine mammals to investigate prey and prey resources.

Collection of marine mammal parts and Export/Re-Import of samples
Parts of dead marine mammals associated with whale and dolphin predation events would be collected. Parts of marine mammals would be collected from the water using a skim net or sieve.

Sloughed skin and feces would be collected from large whales and small cetaceans following certain surface activities (e.g., breaching, tail slapping). Sloughed skin would be collected from the site of the surface activity only after the animals have moved greater than 100 yards from the location. Skin that remains attached to suction cups after tagging would also be collected.

The marine mammal parts and biopsy samples collected during research would be exported for analysis and remaining samples may be re-imported. The requested number of parts, specimens, or biological samples taken, salvaged and/or exported/re-imported is listed in Attachment 1.

Level A harassment would occur during ultrasound, genetic sampling, and suction cup and implant tagging activities. Level B harassment from vessel-based activities and underwater photography, as described above, would occur concurrently.

Ultrasound
Ultrasound would be used to examine blubber thickness of whales. A 12 meter cantilevered pole fitted at the end with a 0.5MHz ultrasound transducer would be used. The instrument would make contact with the back of a surfacing killer whale to obtain the blubber thickness measurement. Contact duration would last approximately one second. Stereo video cameras would be mounted on a 2m mast at the pivot point of the ultrasound apparatus to record the location of the ultrasound readings on the animals, allow time-coded video footage of the ultrasound take, and assist the researchers in estimating the length of the animals (Moore et al. 2001). Individual animals may be approached within 100 m and calves less than 3 years old would not be approached.

Genetic sampling

Biopsy
Skin and attached blubber tissue samples would be collected from large whales and small cetaceans using small, stainless steel biopsy darts ranging from 5-9 mm in diameter and 40-60 mm in length. Darts would be fitted with a flange or "stop" that regulates penetration depth of the bolt/dart and causes recoil after sampling. In no instance would the dart extend through the blubber to the muscle layer. Crossbows, most commonly with a draw of 68 kg (150 lbs), and veterinary rifles using either compressed air or blank charges with adjustable pressure would be used for sample collection. Flotation material secured to the shaft of the bolt/dart would allow it to float and be retrieved after sampling.

Vessels would approach to within 10-30 m of the target animal. Darts would be aimed at the upper back just below the dorsal fin. Biopsy samples would be collected from both sexes and all age classes except neonates; species and take numbers are specified in the take tables for each permit (Attachment 1).

Bow-riding dolphins would be sampled using a handheld extendable pole (6 to 10 feet long) with rubber tubing attached to a trigger that allows the pole to spring forward 2 to 3 feet. Biopsy tips would be screwed to the tip of the pole and consist of sterilized bolts approximately 7 mm in diameter and 3 cm in length and sheathed in rubber tubing to prevent penetration of the skin beyond about 10 mm. The tip would contain three backward-pointing barbs to retain the sample. The resulting sample would consist of a plug of epidermal skin and blubber about 6 mm in diameter and 10 mm in length, taken from the dorsal surface of the animal.

In addition to the mitigation measures described above for close approach, mitigation measures used during biopsy sampling include:

- Using a new sterile dart tip for each sample collected.
- When possible, individuals would be identified prior to sampling to avoid duplication.

Samples would be stored in 20% DMSO in saturated NaCl solution or 70% ethanol and/or stored at –20°C. Tissues remaining after analyses would be archived (by researchers or sent to NMFS' Southwest Fisheries Science Center for archival).

Tagging
Tags would be attached to large whales and small cetaceans via suction cup or implanted into the skin and blubber of animals, depending on the research objectives. Tags would contain a variety of components, depending on the objectives of the research, to record temperature, depth, sound, acceleration, position, pitch and roll, heading, heart rate, vocalizations and ambient noise, and video. Exact dimensions and weights would vary with the generation of tag and the specific components included; examples of current tags are provided in Table 2. Tags would be attached dorsally just in front of or beside the dorsal fin so that the antenna would be exposed when the animal surfaces. The tags would weigh less than 2500 grams (approximately 5.5 lbs) in air and maybe potted in syntactic foam, making them slightly buoyant in water. Most tags would weigh less than 500 g (approximately 1.1 lbs).

Advancements in technology have consistently led to smaller and more effective tags, and this trend is expected to continue in the future. Tagging equipment would be updated as newer models become available, and careful consideration of the primary research objective would be given before finalizing the tag package and deployment system to ensure that the smallest, lightest package is deployed.

Tagging would usually be conducted from small boats (less than 25 m in length), and only in relatively calm seas (i.e., Beaufort 0-2). Animals would be approached to within 2-30 m using the methods described under *Close vessel approach for photo-identification and behavioral observations*. Tags would be attached using a hand-held or cantilevered pole or deployed with a crossbow or airgun. Behavioral responses of tagged individuals and of other animals in the group would be observed and recorded. In some instances, a hydrophone would be placed in the water to monitor acoustic response to tagging.

Tagged animals would be followed by boat at distances between 5 and 500 meters, depending on the species (larger species would be followed from a greater distance) and objectives, to monitor behavior and/or to obtain a trackline of movements. When possible, tags would be retrieved after they release from the animal. Photographs would be taken of the site of tag attachment to evaluate skin condition. In some instances, whales would be tagged twice annually or would receive multiple tags at the same time.

In addition to the mitigation measures described above for close approach, mitigation measures used during tagging include:

- Using sterilized tags for each tagging attempt.
- When possible, individuals would be identified prior to sampling to avoid duplication.
- Limiting tagging of age classes or specific individuals (*e.g.* Mothers and accompanied calves less than 6 months old. Conditions specific for each permit request).

Table 2. Approximate dimensions of tag types. Sizes are subject to variation depending on tag generation and specific research.

Tag Type	**Dimensions**	**Weight***	**Attachment Method**	**Expected Attachment Duration**
VHF/TDR tags	9.5 cm long 2.5 cm diameter	42 g, positively buoyant with floatation	Suction cup	6-8 hours; maximum 72 hours
DTAGs	12 cm x 5 cm	300 g in air	Suction cup	6-8 hours; maximum 72 hours
Bioacoustic probes	19.3 cm long 3.2 cm diameter	<1 kg	Suction cup	4-8 hours; maximum 48 hours
Crittercams	< 12 cm diameter < 35 cm long, including 15cm polyurethane flotation foam tail	< 2.4 kg	Suction cup	≤ 24 hours
Physiological tags	24cm x 8cm x 8cm	<400g	Suction cup/Dart electrode	<12 hours
Barnacle/Limpet/Dart type tags	Up to 6 cm x 5 cm x 2 cm	< 60 g	Two barbed titanium or stainless steel darts implant < 12 cm into blubber	Up to 25 weeks; with weak links to release within one year

* Weight does not include floatation, housing, and attachments unless specified.

Suction cup attachments
Suction cup tags would be attached to large whales and small cetaceans. Suction cups would be approximately 8-10 cm in diameter. Only the suction cups would be in prolonged contact with the animal's skin. Tags would release from the animal when the natural suction of the cup diminishes, or when a magnesium cap that corrodes in salt water causes the release of the tag. Tags would be retrieved by researchers upon release. The animal's behavior, including breaching, rolling, or rubbing, may cause the tag to shed prematurely. The amount of time that a tag would remain on an animal varies, but would generally be less than 96 hours. Attachments would likely last closer to six to eight hours (Lerczak et al. 2000, Croll et al. 2001, Calambokidis 2003, Witteveen et al. 2008).

Examples of these tags include:

- VHF/TDRs
- DTAGs
- Bioacoustic probes
- Crittercams

Figure 1. Examples of various suction cup tags deployed off the US West Coast in past research by applicant. Top left is a Bprobe with floatation Top right is the MK10 Fastlock GPS tag, and at bottom is a National Geographic Crittercam (this is an older version, current V3 is smaller).

Blubber Implant Attachments
Satellite-linked transmitters would be used to quantify movement patterns and dive behavior of whales and dolphins. The transmitters send ultra-high frequency (UHF) radio signals to Argos receivers on five NOAA TIROS-N weather satellites. The signals are sent only when the whales come to the surface, and consist of a 750 ms phase-modulated transmission between 401.610 and 401.690 MHz.

Tags would be attached by implanting into blubber to varying degrees, depending on the species to be tagged and the desired duration of attachments. Attachment methods could include:

- Darts with backwards facing barbs (tag electronics external to animal).
- Implanted or partially-implanted electronics packages.

Implantable Dart Tag
Low Impact Minimally Percutaneous External-electronics Transmitter (LIMPET) tags with a dart attachment system would be used for satellite tagging effort. The tags provide location and depth information. These tags weight up to 59 grams and are approximately 6.3cm x 3cm x 2.2cm with a 17 cm long antennae. The dart portion is made from medical grade titanium and the lengths range up to 7cm with shorter lengths used to tag smaller species. The lower dorsal fin area or dorsal ridge is the target location for attachment. Tags would be expected to stay attached for up to 25 weeks and are designed to release after one year.

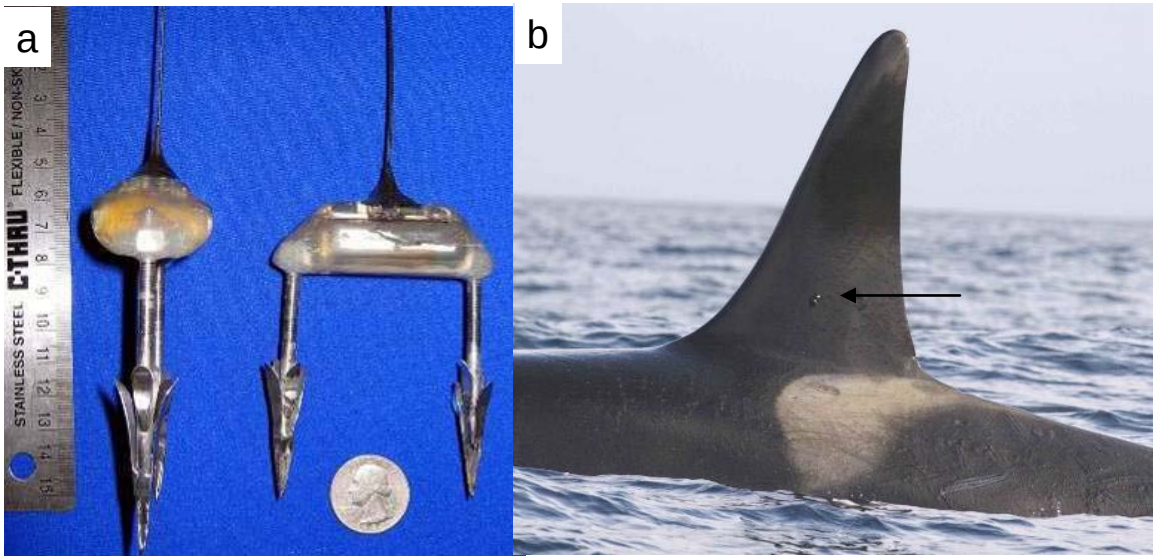

Figure 2: (a) Small satellite "dart" tag design (Unpublished data, Russ Andrews, Alaska SeaLife Center); (b) Tag successfully deployed on the dorsal fin of an adult male killer whale in the Aleutian Islands, Alaska (Unpublished data, NMML; Permit No. 782-1719).

Physiological Tag [electrocardiogram (ECG) electrode]
The ECG tags (Figures 1 and 2) would be used to record data to study diving physiology. The tags measure both heart rate and body temperature. This tag package consists of two

suction/electrode attachments connected by long thin wire (40cm) with an attached data logger. The electrodes are 4mm wide, made of steel or titanium, and penetrate up to 6.5 cm for larger species and 3 cm for small species. These tags would attach to the side of the animal. The tag weighs up to 400 grams and can remain attached up to 2 days, detaching as the result of hydrodynamic drag.

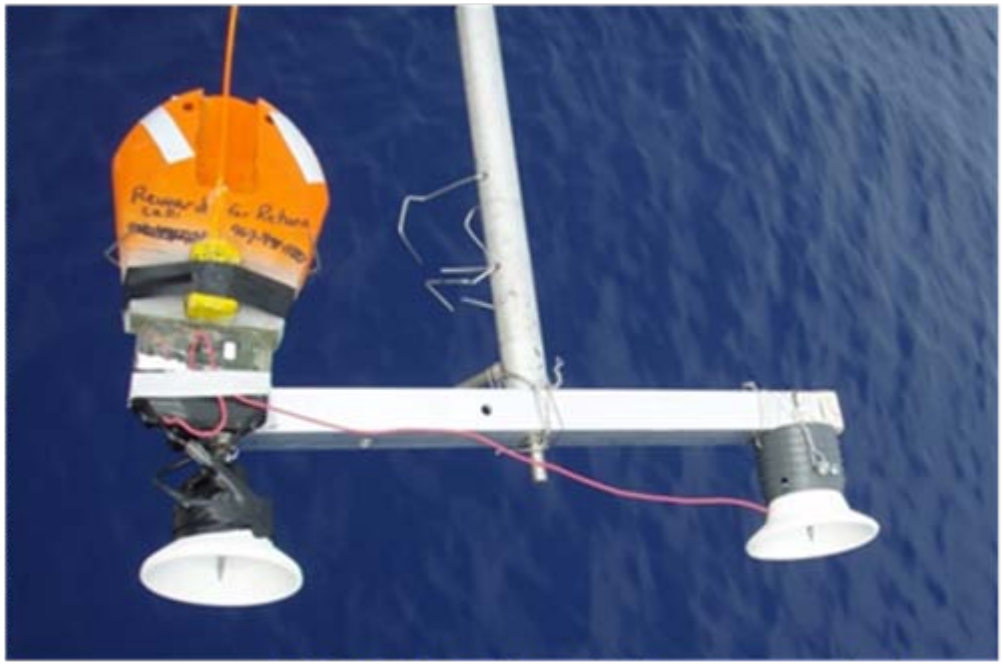

Figure 3. Modified cetacean ECG tag, with tag datalogger body tethered to the primary suction cup/dart electrode, attached to the deployment pole.

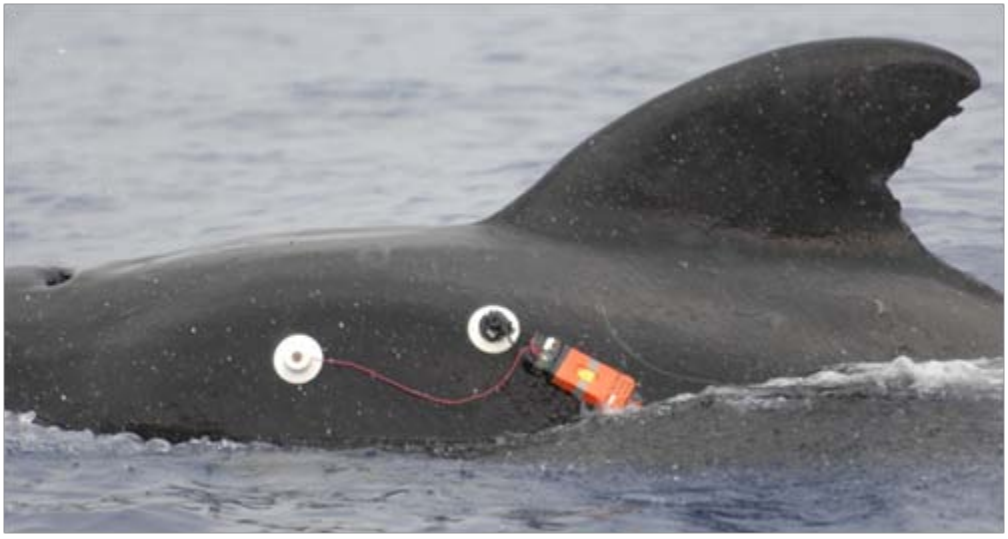

Figure 4. ECG tag attached to pilot whale off the Kona coast of Hawai'i.

Specific permit requests

NWFSC [Responsible Party: Brad Hanson] (File No. 16163)
This research would be a continuation of a long-term assessment of a variety of aspects of the biology and ecology of several cetacean species, with a particular focus on southern resident killer whales. The primary purpose is to obtain information relevant and critical to the management and conservation of species, populations and their key habitats. These activities include monitoring the abundance of cetacean stocks, determining stock structure and population dynamics, determining habitat relationships, and assessing the impact of human activities on these populations of the Pacific Northwest. These efforts support many of the actions of Tier I-III of NMFS stock assessment improvement plan (NMFS 2004).

The proposed research would take place periodically throughout the year primarily in the inland and coastal waters of Washington and Oregon encompassing the U.S. EEZ. Additional effort would extend into inlands and coastal U.S. EEZ waters of California, Alaska and Hawaii; and the high seas of the North Pacific Ocean.

Directed research would involve a combination of methods, as described in *General Methods,* including:

- Vessel and aerial approach for behavioral observation and photo-identification
- Passive acoustic recording
- Breath sampling
- Acoustic playbacks, as detailed below
- Collection of sloughed skin and feces
- Collection of prey parts
- Export of parts
- Ultrasound
- Biopsy sampling
- Suction cup tagging
- Blubber attachment tagging

Specific details or variations from methods described in *General Methods* are described here.

Playback Methods
Various acoustic signals (Table 3) would be directed at southern resident killer whales in order to determine whether particular classes of sounds evoke a mild alerting response. Multiple species may be incidentally taken during the playback episodes. All playbacks would be deployed from an autonomous playback device with a self-contained power supply and electronics that permit it to be deployed without external connections to a power or signal source.

Playbacks and scoring of responses to playbacks would be conducted on small research vessels. The playback procedure would involve scoring of behaviors observed during baseline/pre-exposure, exposure (either experimental or control playback) and post-exposure observations to determine any effects of the playbacks on whale behavior. The duration of behavioral scoring

for post-exposure conditions would be conducted until behaviors return to baseline after the exposure (~30-60 min). Ideally, playbacks would be conducted when at least one individual in a group is tagged using a suction cup archival tag (DTAG), that has both acoustic and dive movement sensors.

In additional to the acoustic recordings obtained from the DTAG, researchers would monitor and record playbacks acoustically using a calibrated hydrophone in the same frequency ranges as the playback sounds as listed in Table 3.

Playbacks would be terminated if any animals in the playback area exhibit behaviors that fall into severity scores of 7 or higher as described in Southall et al. 2007. These include extensive or prolonged behaviors associated with aggression or aversion (jaw clapping/gnashing teeth, aggressive behavior displayed at and including physical contact with the loudspeaker or research vessel associated with the sound source), severe avoidance of the sound source/the research vessel associated with the sound source/area in which the playback occurred, and extensive and prolonged changes in group cohesion.

Groups that include calves less than 1 year in age would not be targeted for playback. Calves (individuals less than 1 year of age) would be determined from known age of SRKWs based on photo-ID records conducted by the Center for Whale Research (see Ford et al. 2000). The target sample size would be at least 10 tagged individuals/groups per playback sound type per year of the study. It is possible that the same individual (either tagged or not tagged) would be exposed to multiple playback series given the social structure of resident killer whales. A targeted individual would be intentionally exposed to a playback series only once per day and only five times total per year to avoid potential cumulative disturbance and also potential habituation affects to the playback exposures.

Table 3. Description of sound types for playbacks.

Sound type	Freq range	Received level	Source depth	Duty cycle	Playback Duration	Pulse length	Rest duration
Simulated vibratory pile driving playback	500 Hz – 20 kHz	<180 dB rms	5-20 m	continuous	Up to 3 min	Up to 3 min	NA
Simulated impact pile driving playback	500 Hz – 20 kHz	< 180 dB $rms_{90\%}$	5-20 m	Up to 20%	Up to 3 min	Up to 0.2 sec (length of 90% energy)	Between 0.8-0.9 sec
Control sounds such as white noise, recorded wave sounds, precipitation, background sounds also presence in experimental playback with the simulated pile driving sounds removed	500 Hz-20 kHz	< 180 dB rms	5-20 m	Will be matched to simulated pile driving sound playback	Up to 3 min	Up to 3 min	Will be matched to simulated pile driving sound playback

Marine mammal and prey imaging with echosounders

Marine mammals would be exposed to echosounder pulses as detailed in Table 4. Due to the width of the echosounder beam, at a 50 m distance, only marine mammals shorter than 5 m may be imaged. Killer whale females are around this length so the off axis energy at 100 kHz is approximately just at hearing threshold (Szymanski et al.1999) in low noise conditions at 50 m when spreading loss and absorption are taken into consideration. This is likely an overestimated assessment because echosounder pulses are directional so this exposure level would only occur when the marine mammal is within the beam of the pulse. Porpoises are the smallest marine mammals to be imaged so shorter ranges are possible and thus, they may be exposed to off-frequency energy but they would never be exposed to sound pressure levels above 179 dB rms. Baleen whales and pinnipeds would not be able to hear any off-frequency energy given their hearing ranges (Southall et al. 2007).

Echosounder pulses (Table 5) would be used to image prey fields in marine mammal habitat but only when marine mammals are likely to be absent, which would be determined by visually monitoring the area during data collection. The pulses would be much shorter (1 ms or less) than auditory temporal integration time constants of marine mammals. That is, marine mammal hearing thresholds increase (hearing sensitivity decreases) exponentially as sound duration decreases for all sounds shorter than the time constant. So, these signals would be weak from the perceptual perspective of the animal.

Only porpoises and smaller delphinids would be able to hear the echosounder. If any of these are sighted within visual range of 100 m, then the echosounder would be turned off and data collection would cease until the animal(s) are outside this range so that potential exposure would always be equal or less than 180 dB.

Table 4. Description of Echosounder Pulses for imaging marine mammals.

Sound type	Freq range	Received level	Source depth	Duty cycle	Duration	Pulse length	Rest duration
Echosounder pulse	100-240 kHz	< 180 dB $rms_{90\%}$ (from 100-180 kHz)	1-50 m	Up to 3%	Up to 2 hrs	0.1-1 ms	33 ms - 10 sec

Table 5. Description of Echosounder Pulses for imaging prey fields.

Sound type	Freq range	Received level	Source depth	Duty cycle	Duration	Pulse length	Rest duration
Echosounder pulses	34-462 kHz .	< 180 dB $rms_{90\%}$ (from 100-180 kHz)	1-50 m .	Up to 3%	Up to 8 hrs .	0.1-1 ms	33 ms - 10 sec

Breath Sampling
Individuals would be approached up to three times for breath sampling. The vessel would approach to within 5m for pole sampling, and the UAV would be maneuvered to no closer than 3m and would remain above the dorsal fin height.

Ultrasound
For the first year of the study, up to 10 adult Alaska resident killer whales would be approached to assess the utility of using this measurement to assess the health and nutritional status of individual killer whales. After the techniques are proven for this population of killer whales, up to 25 Alaskan resident killer whales may be approached annually for ultrasound measurements. Sampling would be conducted during discrete one month periods. Individual animals may be approached within 100 m up to three times per year to attempt ultrasound measurements, but no more than two measurements would be taken from each individual animal per year. No calves less than 3 years old would be approached for measurements.

Biopsy sampling
Individuals would be approached up to three times in one encounter for biopsy attempts and up to ten attempts could be made annually. Multiple biopsies over time are necessary to assess persistent organic pollutants.

Measures described by the applicant to minimize effects to animals include:

- Coordination with other researchers to avoid harassing the same whales.
- If disturbance is evident (i.e., changes in behavior, stress vocalizations, abrupt shifts in direction of movement, apparent displacement) the approach would be terminated.
- Individuals known or estimated to be <3 years old would not be sampled.
- Encounter duration would be limited to 45 minutes.

Tagging Methods

Suction Cup: No more than two tagging attempts per individual per encounter, or four tagging attempts per individual per year, would be made. Individuals would not be tagged more than once per year. No tagging attempts would be made on calves (i.e., whales in association with an adult female, or of a size that would be typical to be in association with an adult female); however, the NWFSC is requesting to tag animals accompanying calves.

Implantable Tags: Sex and age classes to be tagged include adult and juvenile males and females. No tagging attempts would be made on calves estimated to be less than one year of age or females accompanied by calves less than six months of age. Extra care would be taken when tagging females which have calves older than six months present to avoid any unnecessary risks. For Southern resident killer whales (SRKW) only specified adult males and post-reproductive females would be tagged (a list of whales determined eligible for tagging would be updated annually); no reproductive age females or juvenile whales would be tagged.

Individual whales may receive both a suction cup and implantable tag (refer to Attachment 1 for more information by species). Tagged whales would be tracked to monitor post tagging effects for as long as time, whales, and sea state permit. Monitoring would include photographing the attachment site to evaluate tag attachment to the body (skin condition) and tag movement and observing whale behavior.

Calambokidis (File No. 16111)
The applicant requests authorization to continue long-term studies designed to examine marine mammal abundance, distribution, population structure, habitat use, social structure, movement patterns, diving behavior, and diet. The proposed research would also assess the impact of human activities such as ship strikes, noise exposure, contaminants, and fishery interactions on marine mammals. Focal species are endangered blue, fin, humpback, and sperm whales; and eastern gray and beaked whales. An additional 15 cetacean species and five pinniped species would also be studied, including the endangered sei and southern resident stock of killer whales; and the threatened eastern stock of Steller sea lions. The main objectives of the pinniped research are to 1) census harbor seals and other pinnipeds to examine occurrence and abundance primarily in the Puget Sound region; 2) determine mortality and contaminants in harbor seals and

other pinnipeds in Washington State; and 3) examine food habits of harbor seals through collection of scat. See Attachment 1 for the proposed take table.

The proposed methods would take place throughout the year in international and U.S. waters of the eastern North Pacific from Central America to Alaska.

Directed research would involve a combination of activities, as described in *General Activities,* including:

- Vessel and aerial approaches for behavioral observation and photo-identification
- Ground surveys for pinniped population estimates and to collect scat
- Collection of sloughed skin and feces
- Collection of prey parts
- Underwater photography/videography
- Passive acoustic recording
- Imaging marine mammals and prey with echosounders
- Breath sampling
- Biopsy sampling
- Suction-cup tagging
- Dart tagging

Specific details or variations from activities described in *General Methods* are described below.

Aerial Surveys
Aerial surveys would be used to a limited degree to estimate the distribution and abundance of marine mammals in specific regions as well as to assist in locating concentrations of animals for more effective targeting of vessel-based effort and photo-ID. The applicant would also occasionally use aerial surveys to assist in locating VHF signals from tagged animals where the signal may be undetectable from the water's surface. Aerial surveys would be conducted in several aircraft types, depending on the target species and research objectives. For prolonged surveys in waters farther from shore, such as when conducting line-transect surveys for harbor porpoise or other cetaceans, the applicant would use high-wing twin-engine aircraft like the Partenavia Observer. Nearshore scouting surveys for animals would sometimes be conducted from single-engine aircraft. Biological data collected during aerial surveys include: species, number of animals, perpendicular distance from the transect line, direction of travel, and general behavior. Date, time, and position (using a GPS system) would be recorded each minute. Beaufort sea state, cloud cover, sighting conditions, and glare would be noted at the beginning and end of each transect and when significant changes occur. The data would be used to determine the distribution and abundance (and density) of marine animals within the study area.

Vessel operations (including surveys, photo-ID, behavioral sampling, and collection of feces)
Field research would be undertaken from a variety of platforms, primarily small (5-11 m) power vessels, although on occasion larger vessels (10-40 m) may be chartered for offshore surveys. The primary vessels the applicant would employ would be 5.3-5.9 m rigid-hulled inflatable boats (RHIBs) with outboard engines. These vessels would be used to cover coastal waters out to 50 nm offshore during coast based surveys and farther offshore waters when deployed from larger vessels on multi-day surveys. The boats would be transported from one region to another by

trailer so that the researchers can easily respond to changes in whale distribution along the entire US west coast. A number of opportunistic platforms may also be used to obtain additional identification photographs. The applicant would place trained photo-identification personnel on several ship cruises conducted by National Marine Sanctuaries, Southwest Fisheries Science Center (SWFSC) and Scripps Institute of Oceanography.

All cetaceans observed would be approached close enough to identify the species and obtain photographs to confirm species for difficult-to-identify species. Depending on location and the specific survey purpose, more extensive work may be conducted. Photographs of bow-riding animals would also be taken on an opportunistic basis. Approaches would be conducted or supervised by experienced boat drivers. Vessel approaches would typically be done slowly and the vessel maneuvered to approach an animal or group of animals from behind or the side to minimize potential disturbance.

Photo-identification would be used to determine abundance, distribution, and movements of whales. This method would also be used by the applicant to examine aspects of reproduction and mortality rates in large cetaceans. Photo-identification approaches typically would last from a few minutes up to an hour, depending on the sea conditions, time of day, species encountered, behavior and research goals. The animals would be approached closely enough to optimize photographic quality, which varies by species. Generally, animals would be approached to an optimal distance of 50-100 m. Identification photographs would be taken with digital SLR cameras equipped with telephoto lenses (100-400mm). For humpback whales, photographs would be taken of the ventral surface of the flukes. For blue and gray whales, the right and left sides of the animals' backs the vicinity of the dorsal fin or hump would be photographed; flukes would be photographed when possible.

Behavioral work would involve focal follows (primarily undertaken at a distance from which the vessel would not disturb the individuals being followed) with continuous information recorded on group size, composition, distance between and orientation of individuals, directionality of travel, location, interactions with other species, and the occurrence of specific behavioral events (e.g., breaches, spyhops, tail-lobs, prey captures). The maximum duration for a focal follow would be eight hours.

During vessel surveys, fecal material may be visible in the wake of an animal. When possible, this material would be scooped up and preserved for analysis. Samples would be used to determine prey and would be sent to SWFSC, NWFSC, or Scripps Institution of Oceanography.

Ground surveys (including collection of scat)
Ground surveys would consist of population counts and scat collection to study harbor seals and other pinnipeds at haul-out areas in Puget Sound and throughout Washington. Seal scat would primarily be collected during periods when animals are not present to avoid disturbance. In some cases low numbers of animals may be present and the collections may result in disturbance of animals. As reflected in the small number of takes requested, this would be kept to a minimum. Censuses of pinnipeds, primarily harbor seals, on haul-out areas would be conducted using a spotting scope from distances of 100m or more.

Underwater photography/videography
For blue, humpback, fin, and gray whales, the applicant proposes to conduct limited underwater observations and filming (less than 100 approaches per year per species). The objectives of this research are to:

- examine underwater behavior of whales including feeding, vocal, and swimming behavior,
- allow documentation of rates of scarring from killer whale attacks, entanglement, or ship strikes and compare these rates with those determined from above water photography only, and
- examine the incidence and body position of remoras and other parasites.

Underwater filming would be conducted by several means including use of a pole-cam or camera held over the side of the boat as well as approaches made by 1-2 divers in the water equipped with snorkel, scuba, or rebreathers depending on the situation. Divers would approach whales only close enough to obtain good visibility of the whale. Visibility conditions vary quite a bit but the researchers do not anticipate approaches to closer than 5 m of the whales. Divers would not be in the water longer than 10 minutes at a time.

Imaging marine mammal prey
Prey occurrence around whales would be examined with hydroacoustics, especially in the region where suction-cup tags would be deployed on whales to examine diving and feeding behavior. All of the RHIBs are equipped with dual-frequency (50-200 Khz) compact commercial depth sounder units with a transom mounted transducers: Lowrance models HDS-5 (output levels are maximum 250W Peak to Peak, 31W RMS actual) and LCX 15 (output max of 8,000W Peak to Peak). Both of these units are designed for small boats and are below the power of typical of larger vessel units. The applicant's procedure is to have these units on during operations around baleen whales but off when operating around or surveying for beaked whales. Data from the depth sounders would be used to characterize type of prey (based on comparison of returns between 50 and 200 KHz signals). No special surveys would be conducted to systematically map prey fields but returns are examined from near the location of the whales incidental to the photo-ID and suction cup tag research.

Breath sampling
Microbial sampling would be undertaken from small boats. When conditions are appropriate (e.g., light winds, cooperative animals), samples may be collected from individual whales or dolphins otherwise approached for photo-identification. Collection material (e.g., media plates and/or a custom nylon mesh system for collecting exhaled mucous, or vacuum collection container) would be secured to a 3-6 m aluminum or carbon fiber pole. The sampling media would be passed through the exhaled plume over the blowhole after surfacing. There would be no contact with individual whales or dolphins during the procedure. Many samples can be collected from bowriding animals. No reaction is expected from these species (e.g., melon-headed whales, false killer whales, bottlenose dolphins, spinner dolphins, pantropical spotted dolphins, common dolphins, Dall's porpoise), although takes have been included in the case of inadvertent reactions. Reactions by other species are expected to be the same as from vessel approach, which already would be occurring during research activities (e.g., photo-identification). Most samples would be stored on ice or frozen in liquid nitrogen in the field, and

frozen for shipping. Analysis of samples would be conducted by several labs including Hawaii Pacific University, Woods Hole Oceanographic Institution, and IDEXX Laboratories, Grafton, MA.

Collection of skin (free floating and via biopsy)
Skin samples would be collected to examine genetic relatedness, population structure, and sex of individual whales. Samples would also be used for determination of pregnancy status based on hormone levels (Kellar et al. 2006) as well as other tests including contaminant levels (Krahn et al. 2001, Elfes et al. 2010).

Researchers would search the water column in the wake of humpback and blue whales for sloughed skin. This technique has been effective with several species of whales including blue whales off Mexico. Skin samples would be scooped out of the water and preserved for analysis.

Biopsy samples would be collected from whales using the crossbow method described in *General Methods*. An untethered free-floating bolt would generally be used. In some situations (for example when biopsying from a larger ship), a light breakable tether line would be used to aid dart retrieval. Samples would generally be shipped to SWFSC for archiving and long-term storage. Samples collected are would be archived and extracted at SWFSC prior to being provided to other collaborating researchers.

For the large whales that are the focus of the research (blue, fin, humpback, and gray whales), the applicant proposes to biopsy sample calves over four months of age and mothers associated with calves of that age. Calves of other species would not be sampled.

Tagging

<u>Suction-cup tagging</u>
Suction-cup tags would be attached using a long pole (4-7m) to make direct contact with the whale or by using a crossbow. During these types of close approaches, the boat driving would be closely supervised or conducted by personnel with extensive experience operating around whales. The vessel would approach the individual from behind and attempt to match the animal's speed, closing to the length of the pole. Many of the species that would be targeted for suction-cup tagging are small odontocetes which frequently bowride. These animals would be tagged while riding the bow wave of the vessel.

In an encounter to place a tag, each individual whale would be approached no more than three times. Researchers would attempt to place the tags high on the back of the whale mid-way between the blowhole and the dorsal fin. No attachments would be targeted forward of the pectoral fins.

Tags would consist of:

- suction cups to attach to the animal (typically one to four),
- syntactic foam (to float the package once it falls off),
- the instrument package, and
- a VHF transmitter.

Instrument packages would include a combination of the following instruments and devices:

- Hydrophone and recording system for underwater vocalizations
- Pressure sensor to record water depth
- Sensor to monitor and record water temperature
- 3-axis accelerometers to measure pitch and roll of animal
- 3-axis solid state magnetometers to measure heading
- Conductivity switch to control underwater instrument activation
- VHF tag to provide local positioning information
- Satellite tag to record long-range movements
- Underwater video camera to record behavior and prey

Tags would generally remain attached for a few hours to a few days, and simply fall off the individual when they lose suction. The tags float to the surface and can be recovered by tracking them down using the VHF signal emitted by the tag. Some systems like the Crittercam would have release mechanisms since the Hi-8 Crittercam system can only record continuously for 2-4 hours. The Burgess acoustic tag would not have a release because the goal is to deploy the tag for as long as possible and this system can gather and store information (depending on sampling rate) for many days (typically one to four days).

The heaviest tag proposed is the Hi-8 version of the Crittercam which weighs 2.4 kg. All other systems weigh considerably less than that and an ongoing goal of the researcher would be to continue to shift towards smaller and lighter systems. The primary tag, the Burgess bio-acoustic probe, weighs under 1 kg and is currently packaged in resin in a cylindrical form measuring 19.3 cm long and 3.2 cm diameter. Flotation and VHF transmitter roughly double this length.

Dart tagging

Satellite tags

The applicant proposes to use the Low Impact Minimally Percutaneous External-electronics Transmitter (LIMPET) tag (Andrews et al. 2008, Schorr et al. 2009), with a dart attachment system. This system is currently in use by other researchers working with killer whales in Alaska and in the Antarctic, as well as beaked whales and several other species in the Bahamas, and these tags have been successfully deployed by Cascadia Research (e.g., Schorr et al. 2009, Baird et al. 2010) on 14 different species: bottlenose dolphin, Risso's dolphin, killer whale, short-finned pilot whale, false killer whale, melon-headed whale, pygmy killer whale, Cuvier's beaked whale, Blainville's beaked whale, sperm whale, fin whale, blue whale, minke whale and humpback whale.

Dart length would vary by species, tags used on smaller species (e.g., bottlenose and Risso's dolphins) would have shorter dart lengths than those for large whales. These differences are based on the target location on the animal (dorsal fin vs. back) and blubber thickness. Currently, the longest darts in use for smaller cetaceans are 7cm in length. When the transmitter is deployed flush on the dorsal fin the backward facing petals would be located below the vertical sheath of the dorsal fin (the tissue layer with the greatest structural integrity) in order to provide the most secure anchoring. For large whales, the dorsal ridge/back is the primary target. The

applicant is requesting a maximum depth of 12cm for the dart depth (maximum shaft length) for species like humpback, gray, and sperm whales with blubber depths typically larger than this.

Tags would be deployed with a pneumatic projector, a crossbow, or a pole, at distances from 2-30 m. The tag is attached to an arrow using a holder and water-soluble tape which secures the tag to the arrow until contact with the whale is made. Upon impact with the whale, the arrow most often immediately bounces free. In the few cases where the arrow holds on, it would generally separate from the tag upon submersion in the water. High resolution photographs would be taken of all tagged animals whenever possible for individual photo-identification (to assess population identity and for examining tag impacts), to confirm sex (e.g., with beaked whales), to document tag deployment location on the body and to document tag orientation (e.g., whether the tag is flush against the dorsal fin).

Physiological tags

The tag for recording physiological variables, including heart rate, is an archival tag where information is stored on-board the tag during the attachment, and then it must be retrieved for data downloading. The tag is buoyant and capable of releasing easily from the tagged whale. The tag weighs between 200 and 400 grams depending on battery configuration and in its largest configuration would measure approximately 24 cm by 8 cm by 8 cm.

The physiological tag would be attached to the dorsal surface of the target animal, near the dorsal fin. The tag would be deployed primarily using a pole (if smaller configurations are developed then delivery with a cross-bow or an air gun may become an option). The tag adheres to the whale with a combination of suction cup and dart electrodes. In order to pick up the biopotential of the ECG, the tag is connected to two electrodes that must be in contact with the body of the whale. The tag would be held to the tagged individual with two suction cups that include a small dart electrode and are attached to each other with a thin wire.

For larger species (short-finned pilot whales, killer whales, false killer whales, Blainville's beaked whales, Cuvier's beaked whales, Baird's beaked whales, Longman's beaked whales), the electrode darts would penetrate no more than 6 cm into the tagged individual (current darts used for satellite tagging of these species measure 6.5 cm). For small species (pygmy killer whale, melon-headed whale, bottlenose dolphin, rough-toothed dolphin, Risso's dolphin, dwarf sperm whale, pygmy sperm whale) the electrode darts would penetrate no more than 3 cm. The suction cup would hold the tag to the body for a limited time, but once the suction cup breaks free, then the drag of the tag would pull the dart electrodes out and the tag would float at the surface for retrieval.

Multiple methods

Some animals would experience a suite of research activities, including biopsy sampling and having multiple tags attached. Typically, animals would be photographed first and often the same approach would be used to attempt to tag or obtain a biopsy sample.

Generally animals may receive two tags, but in rare cases, the researcher may choose to attach three tags to the same animal. Some potential tagging configurations:

- Multiple complimentary suction-cup tags: if possible, attached on the same approach. This would usually consist of the deployment of an acoustic tag like the Bprobe in combination with a Mk10 Fast-lock GPS tag (that does not have acoustics). While both tags records depth, they have other capabilities unique to each tag that complement each other. Deployment of these on the same approach using two taggers with two poles causes fewer disturbances than doing so on two separate approaches.

- Deployment of a suction cup tag and a dart tag on the same individual: this is unlikely to be deployed on the same approach due to differences in approach distances and angles ideal for the two deployments. No more than 20% of deployments of either tag type would be on individuals subjected to both procedures. The long-term dart tags would provide movement data and summarized depth information that would complement the high resolution but short-term information provided by the suction cup tags and would aid in tag calibration and testing. In cases where species are rarely encountered (e.g., Cuvier's beaked whales, Longman's beaked whales, false killer whales), tagging with both a dart/satellite tag and a suction-cup attached data logger would allow simultaneous collection of information on both movements and detailed diving/acoustic behavior.

<u>The Center for Whale Research (CWR)/Balcomb (File No. 15569)</u>
The applicant requests authorization to continue long-term studies (most recently authorized under Permit No. 532-1822-02) with the goal of determining the population size and structure of the ESA listed SRKWs and other ecotypes of killer whales throughout their range. Other non-target species that may be opportunistically taken include 17 cetacean species and four pinnipeds species. Those species that are listed as endangered include the blue, fin, sei, humpback, and right whales; in addition to the threatened eastern stock of Steller sea lions. See Attachment 1 for the proposed take table.

The proposed activities would take place periodically throughout the year in the Eastern North Pacific Ocean primarily in the inland waters of Washington state with additional opportunistic effort from California to Alaska and out to 200nm offshore.

Directed research would involve a combination of activities, as described in *General Methods,* including:

- Vessel and aerial approaches for behavioral observation and photo-identification
- Remote measuring/ Photogrammetry (aerial and laser techniques)
- Passive acoustic recording
- Collection of feces
- Collection of prey parts

Specific details or variations from activities described in *General Methods* are described here.

Vessel Approaches
(for behavioral observation, photo-identification; and collection of feces and prey parts)
CWR has an assortment of vessels available for research activities ranging from a 16’ aluminum skiff to a 65’ sailboat. Use of a particular vessel would be dependent on the weather conditions,

geographic area, available personnel, and specific tasks to be conducted. Up to two vessels would be used in an encounter with the whales to maximize research effort. The vessels up to 25' are gas outboard powered, the trawlers are diesel inboard powered, and the sailboats are sail powered with auxiliary diesel power.

Target animals would be approached to within 100 yards and would be abandoned if approaches cause any response that rises to a level of biological significance (terror, abandonment of habitat, cease reproduction, etc.). The number of times an animal may be approached during an encounter is variable, and can often only be determined in post-analysis. The maximum duration of an approach encounter would be ten hours, but is dependent on the species. Attempts to approach an individual or a cohesive group of killer whales within 200 yards might typically include up to ten attempts within a maximum duration of four hours. Humpback whales could be approached within 100 yards during up to five approach attempts within a maximum duration of 30 minutes.

The vessels would operate at the most efficient hull speeds in survey mode, slow to approximately the whales' speed at a distance of approximately one-quarter mile, and gradually adjust slow speed to parallel (e.g., photo-identification KW mode – typically side view photography), or to be behind for photographing flukes (e.g., humpback mode), and fecal or prey collection.

Aerial Approaches
(for remote measuring and photo-identification)
The following aircraft could be utilized depending upon weather conditions, geographic location, personnel available, and specific tasks to be accomplished: single engine amphibious aircraft, twin engine aircraft, helicopter, and lighter than air craft (eg. zeppelin). These aircraft would fly at a survey altitude of 750-1000 feet.

Photo-identification
Photo-identification is primarily accomplished using digital photography, either DX or full-frame 35mm digital, or HD and other high resolution video and telephoto lenses; however, 35mm film cameras, telephoto lenses, and archival curation would be employed. The images would be maintained and backed-up on computers on site and off site. The analysis of images would be done on site using CWR proprietary methods and experienced personnel for "matching."

Remote Measuring/Photogrammetry
Photogrammetry morphometric measurements are based on photographing two laser dots that have been projected onto the body of a whale using two small laser-pointers (Durban et al. 2006). These laser-pointers are mounted in a parallel orientation to maintain a fixed and known separation distance. The dots provide a scale of known dimension on the image of the whale that can be used to calibrate morphometric measurements. This laser setup can be mounted on a camera lens and implemented in conjunction with photo-identification studies by a single photographer.

CWR has also utilized photogrammetry methods via an aerial platform to obtain precise estimates of full body size photogrammetric measurements of cetaceans (Fearnbach et al. 2011), due largely to the ability of helicopters to hover at a fixed (and known) altitude and make relatively subtle adjustments in location to remain directly overhead of target animals. While directly overhead the target animal, the photographer would shoot photographs using a hand-held digital SLR camera with a bubble-level attached to the back of it to ensure that the camera was orientated vertically. Photographs would be taken when the whale was at the water surface and parallel to the water surface. The GPS and camera time would be synchronized so that each image can be linked to a specific altitude using a relational database.

Passive Acoustics
Passive acoustic sampling would be conducted using both fixed hydrophones and towed hydrophones or sonobuoys from near surface to 200' depth in the whales' habitat. The acoustic recordings are archived digitally and backed-up on computers on site and off site.

The Whale Museum (File No. 16160)
The proposed research is to monitor and record vessel activities around marine mammal species routinely encountered by commercial and recreational vessels in the inland waters of Washington State. This research would contribute to a long term data set (Orca Master) that has provided critical information on characterizing annual vessel trends around Southern Resident killer whales. Through this research the effectiveness of federal, state and local marine wildlife guidelines and regulations through the Soundwatch program could be evaluated. Data collection would consist of: 1) counts of vessels near wildlife by type, location and activity; 2) wildlife/whale identification, location, travel direction and selected behaviors; 3) vessel information (port, number of passengers, knowledge of guidelines/regulations); 4) commercial and private vessel compliance with voluntary guidelines and/or regulations; and 5) vessel behaviors in designated Marine Protection Areas (MPAs). All Soundwatch data on marine wildlife/whale identification, location, travel direction and selected behaviors is incorporated into The Whale Museum's whale long-term sightings database and Orca master database. These efforts support the actions listed under B.6.2.1 and B.6.2.2 in the Southern Resident killer whale Recovery Plan (NMFS 2008). Research activities for this project would focus on Southern Resident killer whales and other species would also be targeted for research. Species and take numbers are specified in Attachment 1.

The researchers intend to conduct surveys year round but most surveys would occur every day from May – October. The proposed action area would include the Haro Strait region, Columbia River, and offshore waters of Washington State, and the southern waters of Vancouver Island, British Columbia, Canada.

Directed research would involve the following, as described in *General Methods*:

- Vessel approaches for behavioral observation, photo-identification, and monitoring

Specific details or variations from activities described in *General Methods* are described here.

Vessel Approaches (for behavioral observation, photo-identification, and monitoring)

The Soundwatch program operates from a 19-foot S.A.F.E. (Safe All-around Flotation Equipped) boat with a 179 hp Volvo/Penta diesel inboard engine and a dual stainless steel propeller. Vessel and whale monitoring would be conducted continuously using binoculars, laser range-finders and radar to determine whale locations, direction of travel, behaviors, and commercial and private vessel compliance to the voluntary guidelines and regulations. Vessel incidents are recorded opportunistically using Soundwatch Vessel Incidents data sheets as they are observed. Every time a vessel is seen, vessel information would be recorded on a Soundwatch Vessel Contact data sheet. Surveys of whales and a count of vessels within one half-mile of whales would be collected every half-hour (on-the-hour and half-hour) using a Soundwatch Vessel Count/Whale Survey data sheet.

Measures described by the applicant to minimize disturbance to animals include:

- Researchers immediately shut down the engine when the survey vessel is within 100 yards of marine mammals.
- Researchers would put the engine into neutral, and let the animal(s) pass beyond 100 yards before engaging the engine and moving to a greater distance away.

Permit Duration:
The proposed permits would be valid for five years from the date of issuance, which is the maximum duration of an MMPA permit. A single one-year extension of these permits may be authorized and would be considered a modification, pursuant to NMFS regulations at 50 CFR §222.306.

The extensions would not change any other terms or conditions of the permits. NMFS does not consider a one-year extension of this nature to represent a substantial change to the proposed action that involves changes in environmental impacts. As such, NMFS would not prepare a supplemental EA for the one-year extension unless substantive new information or circumstances relating to environmental impacts is available (e.g., a change in the status of the target species, listing of new threatened or endangered species in the project area).

Target Species or stocks:
The applicants' research is directed at 38 species of cetaceans (including their individually managed stocks) (Attachment 1). The requested actions involve Level A and B harassment that may indirectly affect seven pinniped species. The permits would exempt takes of all these marine mammals that could be potentially disturbed. This is consistent with the MMPA definition of harassment in which actions with a potential to injure a marine mammal or disturb a marine mammal in the wild by causing disruption of behavioral patterns including migration, breathing, nursing, breeding, feeding, or sheltering which are considered a take. The inclusion of "potential to" in this definition means that the take occurs regardless of whether there is an injury or a disruption in the behavioral patterns of marine mammals exposed to the action.

3.0 AFFECTED ENVIRONMENT

Location
The taking of marine mammals would occur in (sub-surface observation), on (vessel based surveys) or over (aerial based surveys) the waters of the North Pacific ocean including U.S. EEZ

and state waters off of Alaska, Washington, Oregon, California, Hawaii, U.S. territories, and international waters.

Status of Species

There are 38 species of cetaceans found in the study area that would be targeted for research (Attachment 1). Of these 38, six are listed as endangered, one (killer whales) has a Distinct Population Segment (DPS's) that is listed as endangered, and one (false killer whale) has a DPS proposed for ESA listing. Gray whales have one listed DPS in the western Pacific; however, their range falls outside the action area and are not included. There are seven species of pinnipeds, including three that are ESA listed, that may be subject to Level B harassment (Table 6) incidental to activities directed at cetaceans. Further details on the species and the status by stock can be found in the Alaska and Pacific U.S. Stock Assessment Reports (Allen and Angliss, 2011; Caretta et.al. 2011).

ESA-Listed Species

Sei whale *(Balaenoptera borealis):* Sei whales are listed as depleted under the MMPA and endangered under the ESA, throughout their range. Within the Pacific U.S. EEZ, sei whales are divided into two discrete stocks: the Eastern North Pacific stock and the Hawaii stock.

Eastern North Pacific stock: The best abundance estimate for whales off the coasts of California, Oregon and Washington is 126 animals with an annual Potential Biological Removal (PBR) level of 0.17 (Caretta et al., 2011). No population trend is available for this stock.

Hawaii stock: The best abundance estimate for whales off Hawaii is 77 animals with an annual PBR level of 0.1 (Caretta et al., 2011). No population trend is available for this stock. There have been no reported fishery related mortality or serious injuries of sei whales in the Hawaiian Islands EEZ and is not considered to be a significant concern.

Blue whale *(Balaenoptera musculus):* Blue whales are listed as depleted under the MMPA and endangered under the ESA, throughout their range. Within U.S. waters in the North Pacific, blue whales are divided into two stocks: Western and Eastern. Insufficient data are available to evaluate the current abundance or population trends of blue whale stocks in the western North Pacific. The best estimate of blue whale abundance in the eastern North Pacific is 2,842 animals with an annual PBR of six whales per year in U.S. waters. Along the California coast blue whale abundance has been increasing during the past two decades (Barlow, 1994; Calambokidis and Barlow, 2004; Calambokidis et al., 1990).

Table 6. ESA-listed species targeted for study in the proposed action by permit, location, and level of harassment.

Species		NWFSC File No. 16163	Calambokidis File No. 16111	Balcomb File No. 15569	The Whale Museum File No. 16160
Southern Resident Killer whale	Level A	X			
	Level B	X	X	X	X
Humpback whale	Level A	X	X		
	Level B	X	X	X	X
Blue whale	Level A	X	X		
	Level B	X	X	X	
Fin whale	Level A	X	X		
	Level B	X	X	X	
Sei whale	Level A	X	X		
	Level B	X	X	X	
Sperm whale	Level A	X	X		
	Level B	X	X	X	
North Pacific right whale	Level A				
	Level B	X		X	
Hawaiian insular false killer whale	Level A	X			
	Level B	X			
Stellers sea lion (Easter and Western)	Level B	X	X	X	
Guadalupe fur seal	Level B	X			
Hawaiian monk seal	Level B	X			

Fin whale *(Balaenoptera physalus):* Fin whales are listed as depleted under the MMPA and endangered under the ESA, throughout their range. Three stocks of fin whales are recognized in Pacific U.S. waters: the California/Oregon/Washington stock, the Northeast Pacific (Alaska) stock, and the Hawaii stock.

California/Oregon/Washington stock: This stock is found along the U.S. west coast from California to Washington in waters out to 300 nmi. Because fin whale abundance appears lower in winter/spring in California (Dohl et al., 1983; Forney et al., 1995) and in Oregon (Green et al., 1992), it is likely that the distribution of this stock extends seasonally outside these coastal waters. The best available estimate of the stock's population size is 3,044 whales with a PBR of 16 whales (Carretta et al., 2011).

Northeast Pacific (Alaska) stock: Whales in this stock are found from Canadian waters north to the Chukchi Sea. Reliable estimates of current and historical abundance of fin whales in the entire northeast Pacific are currently not available. Based on surveys which covered only a small

portion of the range of this stock, a rough minimum estimate of the size of the population west of the Kenai Peninsula is 5,700 with a PBR level of 11.4 whales (Angliss and Allen, 2009). Data suggests that this stock may be increasing at an annual rate of 4.8 percent; however, this is based on uncertain population size and incomplete surveys of its range (Angliss and Allen, 2009).

Hawaii stock: The best available abundance estimate for this stock is 174 whales based on a 2002 survey of the entire Hawaiian Islands EEZ (Barlow, 2003) with a PBR of 0.2 whales per year (Carretta et al., 2010). Data is not available to determine a population trend for this stock.

North Pacific right whale *(Eubalaena japonica):* In April 2008, the North Pacific right whale was listed as a separate, endangered species. There are no reliable estimates of current abundance or trends for right whales in the North Pacific including the eastern or western population. For the western North Pacific, sighting survey estimates for the summer feeding ground indicate an abundance of around 900 in the Sea of Okhotsk. Over the past forty years, most sightings in the eastern North Pacific have been of single whales. However, during the last few years, small groups of right whales have been sighted (Wade et al., 2006, 2011).

Humpback whale *(Megaptera novaeangliae):* Humpback whales are listed as depleted under the MMPA and endangered under the ESA, throughout their range. Three management stocks of humpback whales are recognized within the North Pacific: the eastern North Pacific stock, the central North Pacific stock, and the western North Pacific stock. Population estimates for the entire North Pacific are estimated to be just under 20,000 animals (Calambokidis et al. 2008). The population is estimated to be growing six to seven percent annually (Carretta et al. 2009). Winter breeding areas are known to occur in Hawaii, Mexico, and south of Japan. Around the Hawaiian Islands, humpback whales are most concentrated around the larger islands of Maui, Molokai, Lanai, and Kahoolawe.

Eastern North Pacific stock: The eastern North Pacific stock is referred to as the winter/spring population in coastal Central America and Mexico which migrates to the coast of California to southern British Columbia in summer/fall (Steiger et al., 1991; Calambokidis et al., 1993). The best available abundance estimate for this stock is 2,043 whales and appears to be increasing in abundance (Carretta et al., 2010).

Central North Pacific stock: The central North Pacific humpback whale stock is referred to as the winter/spring population of the Hawaiian Islands which migrates to northern British Columbia/Southeast Alaska and Prince William Sound west to Kodiak (Baker et al., 1990; Perry et al., 1990; Calambokidis et al., 1997). Population estimates vary for this stock, but the most recent estimate was calculated to be 5,833 (Allen and Angliss, 2010). The stock appears to be increasing, with a PBR of 61.2 animals.

Western North Pacific stock: The western North Pacific Stock is referred to as the winter/spring population of Japan and probably migrates to waters west of the Kodiak Archipelago (the Bering Sea and Aleutian Islands) in summer/fall (Berzin and Rovnin, 1966; Nishiwaki, 1966; Darling, 1991). This population is estimated to include 938 individuals and the PBR is calculated to be 2.6. Current data indicate the population size is trending upwards but no confidence limits are available.

Sperm whale *(Physeter macrocephalus):* Sperm whales are listed as depleted under the MMPA and endangered under the ESA, throughout their range. Currently, no good estimate is available for the total number of sperm whales in the Pacific. For management purposes, sperm whales inhabiting U.S. Pacific waters have been divided into three stocks.

California-Oregon-Washington stock: Sperm whales are found year-round in California waters, but they reach peak abundance from April through mid-June and from the end of August through mid-November. They have been seen in every season except winter in Washington and Oregon. The most precise and recent estimate of sperm whale abundance for this stock is 971 animals from the ship surveys conducted in 2005 (Forney, 2007) and 2008 (Barlow, 2010). Survey data from the last few decades indicate that sperm whale abundance has been rather variable off California and does not show obvious trends.

North Pacific (Alaska) stock: The shallow continental shelf apparently bars the movement of sperm whales into the northeastern Bering Sea and Arctic Ocean. Males are thought to move north in the summer to feed in the Gulf of Alaska, Bering Sea, and waters around the Aleutian Islands. Current and historic estimates for the abundance of sperm whales in the North Pacific are considered unreliable. The number of sperm whales of the North Pacific occurring within Alaska waters is unknown. Consequently, the PBR for this stock is unknown.

Hawaiian stock: Summer/fall surveys in the eastern tropical Pacific show that although sperm whales are widely distributed in the tropics, their relative abundance tapers off markedly westward towards the middle of the tropical Pacific and tapers off northward towards the tip of Baja California. The best estimate for sperm whales occurring in U.S. waters of Hawaii is 6,919 (Barlow, 2006); however, no population trend is available. The PBR for this stock is 7.6 animals per year.

Eastern North Pacific Southern Resident Killer Whale stock (SRKW) *(Orcinus orca):* SRKW's are listed as depleted under the MMPA and endangered under the ESA, throughout their range. The population is currently estimated at about 88 whales, with a PBR of 0.17 animals per year. The estimated population shows a decline from its estimated historical level of about 200 during the mid- to late 1800s. Beginning in about 1967, the live-capture fishery for oceanarium display removed an estimated 47 whales and caused an immediate decline in SRKW numbers. The population fell an estimated 30% to about 67 whales by 1971. By 2003, the population increased to 83 whales.

Hawaiian Insular stock of false killer whales (*Pseudorca crassidens*): NMFS has proposed (75 FR 70169; 11/17/2010) that the Hawaiian Insular stock of false killer whales is a distinct population segment and should be listed as endangered under the ESA. Within waters of the central Pacific, four Pacific Islands Region management stocks of false killer whales are currently recognized for management under the MMPA: the Hawaii Insular stock, the Hawaii pelagic stock, the Palmyra Atoll stock, and the American Samoa stock (Carretta et al., 2010). The best estimate of current population size of Hawaiian insular false killer whales is 123 individuals (Baird et al., 2005).

Hawaiian Monk Seal (*Monachus schauinslandi*): Hawaiian Monk seals are listed as depleted under the MMPA and endangered under the ESA, throughout their range. The best estimate of the total population size is 1,161. (Caretta et al., 2010). This estimate is the sum of estimated abundance at the six main Northwest Hawaiian Islands subpopulations, an extrapolation of counts at Necker and Nihoa Islands, and an estimate of minimum abundance in the main Hawaiian Islands. The total of mean non-pup beach counts at the six main reproductive NWHI subpopulations in 2007 is 68% lower than in 1958. A log-linear regression of estimated abundance on year from 1999 (the first year for which a reliable total abundance estimate has been obtained) to 2008 estimates that abundance has declined -4.5% yr-1 (95% CI= -5.0% to -3.9% yr-1).

Guadalupe fur seal (*Arctocephalus townsendi*): The Guadalupe fur seal is listed as threatened under the ESA and depleted under the MMPA. They are distributed along the west coast, centered around Guadalupe Island off the west central Baja California coast. Their population has expanded in recent years and small colonies have formed in the Channel and Farallon Islands off of California. The best estimate of the total population size is from 1993 and is 7,408. (Caretta et al., 2009), with an estimated growth rate of 13.7% and a PBR of 91 animals per year.

Steller sea lions (*Eumetopias jubatus*): Steller sea lions are listed as depleted under the MMPA and threatened (eastern) or endangered (western) under the ESA. Critical habitat has been defined for Steller sea lions as a 20 nautical mile buffer around all major haul-outs and rookeries, as well as associated terrestrial, air and aquatic zones, and three large offshore foraging areas. For management purposes, Steller sea lions inhabiting U.S. waters have been divided into two Distinct Population Segments (DPSs) at 144° West longitude (Cape Suckling, Alaska).

Western DPS: Currents population estimates are a minimum of 42,366 SSLs in the Western DPS and 58,334-72,223 in the Eastern DPS (Allen and Angliss, 2010). Population surveys suggest that the Eastern DPS is stable or increasing in the northern part of its range (Southeast Alaskan and British Columbia), while the remainder of the Eastern DPS and all the Western DPS is declining. NMFS recently received two petitions to delist the Eastern DPS and is soliciting comments on these requests.

Eastern DPS: Overall, the Eastern DPS has increased over 3 percent per year since the 1970s, more than doubling in southeast Alaska, British Columbia, and Oregon. The Eastern DPS contained only about 10 percent of the total number of SSLs in the United States in the 1970s. However, large declines in the Western DPS coupled with notable increases in the east resulted in a shift such that over half of the SSLs in the U.S. now belong to the Eastern DPS (NMFS, 2006a). The most recent status review for this DPS indicates that it is recovering sufficiently and has been proposed for delisting by NMFS.

Non-ESA Listed Species

Of the 32 non-listed cetacean and 4 pinniped species, two (AT1 killer whales and northern fur seals) have stocks considered depleted under the MMPA and five have stocks that are data deficient with no population estimate available (minke, Baird's beaked, Cuvier's beaked, and dwarf sperm whales; and harbor seal). The remaining non-listed species marine mammals are from populations that are considered either stable or increasing in size.

Table seven lists the non-ESA species for each proposed action. More information about each stock may be found in the respective Stock Assessment Reports, which are available online at http://www.nmfs.noaa.gov/pr/sars/species.htm.

Non-Target Marine Animals

In addition to the non-target marine mammal stocks and species that are listed in Table 7, an assortment of mammals, sea birds, sea turtles, fish and invertebrates may be found in the action area during the proposed research including sea otter (*Enhydra lutis*), leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*) sea turtles; canary rockfish (*Sebastes pinniger*); Chinook salmon (*Oncorhynchus tshawytscha*), and its designated critical habitat; steelhead trout (*O. mykiss*); chum salmon (*O. keta*) and its designated critical habitat; coho salmon (*O. kisutch*); bocaccio *(Sebastes paucispinis)*; Pacific eulachon (smelt) *(Thaleichthys pacificus);* yelloweye rockfish *(Sebastes ruberrimus*); green sturgeon *(Acipenser medirostris)*; and protected birds such as marbled murrlets (*Brachyramphus marmoratus*). The research is directed at marine mammals and the permit only allows takes of marine mammals. The takes of marine mammals by harassment would not affect any non-target marine animals. For these reasons, the effects on non-target species are not considered further.

Biodiversity and Ecosystem Function

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

Ocean and Coastal Habitats

The action area includes designated critical habitat for SSLs, North Pacific right whales, southern resident killer whales, northern sea otters, marbled murrelets; and proposed critical habitat for Cook Inlet beluga whales and leatherback turtles. The proposed action is directed at marine mammals and does not affect habitat. It does not involve alteration of substrate, movement of water or air masses, or other interactions with physical features of ocean and coastal habitat. Thus, effects on habitat would not be considered further.

Table 7: Other species targeted for study in the proposed action, by permit and level of harassment.

Species		NWFSC File No. 16163	Calambokidis File No. 16111	Balcomb File No. 15569	The Whale Museum File No. 16160
Dolphin, bottlenose	**Level A**	X	X		
	Level B	X	X		
Dolphin, common, short-beaked	**Level A**	X			
	Level B	X	X		
Dolphin, common, long-beaked	**Level A**	X			
	Level B	X	X		
Dolphin, Fraser's	**Level A**				
	Level B	X			
Dolphin, northern right whale	**Level A**	X	X		
	Level B	X	X		
Dolphin, Pacific white-sided	**Level A**	X	X		
	Level B	X	X	X	X
Dolphin, pantropical spotted	**Level A**				
	Level B	X			
Dolphin, Risso's	**Level A**	X	X		
	Level B	X	X	X	
Dolphin, rough-toothed	**Level A**	X			
	Level B	X			
Dolphin, spinner	**Level A**				
	Level B	X			
Dolphin, striped	**Level A**	X			
	Level B	X	X		
Whale, Baird's beaked	**Level A**	X	X		
	Level B	X	X	X	
Whale, mesoplodont, beaked	**Level A**	X	X		
	Level B	X	X	X	
Whale, Blainville's beaked	**Level A**	X			
	Level B	X			

Whale, Bryde's	**Level A**	X	X		
	Level B	X	X	X	
Whale, Cuvier's beaked	**Level A**	X	X		
	Level B	X	X	X	
Whale, dwarf sperm	**Level A**	X			
	Level B	X	X		
Whale, false killer	**Level A**	X			
	Level B	X			
Whale, gray	**Level A**	X	X		
	Level B	X	X	X	X
Whale, Hubbs' beaked	**Level A**				
	Level B	X			
Whale, killer	**Level A**	X	X		
	Level B	X	X	X	X
Whale, Longman's beaked	**Level A**	X			
	Level B	X		X	
Whale, melon-headed	**Level A**	X			
	Level B	X			
Whale, minke	**Level A**	X	X		
	Level B	X	X	X	X
Whale,Perrin's beaked	**Level A**				
	Level B	X			
Whale, pilot, short-finned	**Level A**	X	X		
	Level B	X	X		
Whale, pygmy beaked	**Level A**				
	Level B	X			
Whale, pygmy killer	**Level A**	X			
	Level B	X			
Whale, pygmy sperm	**Level A**	X			
	Level B	X	X		
Whale, Stejneger's beaked	**Level A**	X			
	Level B	X			
Porpoise, harbor	**Level A**	X	X		
	Level B	X	X	X	X
Porpoise, Dall's	**Level A**	X	X		
	Level B	X	X	X	X

Seal, northern elephant	**Level A**	X			
	Level B	X	X		
Sea lion, California	**Level A**	X			
	Level B	X	X	X	
Seal, harbor	**Level A**	X			
	Level B	X	X	X	
Seal, northern fur	**Level A**				
	Level B	X	X	X	

Unique Areas

Research may be conducted in the marine portion of several sanctuaries, monuments, and marine protected areas located within the action area and include:

- Olympic Coast National Marine Sanctuary
- Hawaiian Islands Humpback Whale National Marine Sanctuary
- Papahānaumokuākea Marine National Monument
- Palmyra Atoll National Wildlife Refuge
- Cordell Bank National Marine Sanctuary
- Gulf of the Farallones National Marine Sanctuary
- Channel Islands National Marine Sanctuary
- Monterey Bay National Marine Sanctuary
- San Juan Islands National Wildlife Refuge
- Protection Island National Wildlife Refuge

All holders of NMFS's scientific research permits conducting work within a National Marine Sanctuary are required to obtain appropriate authorizations from and coordinate the timing and location of their research with NOAA's National Marine Sanctuaries Program (NMSP) to ensure that the research would not adversely impact marine mammals, birds or other animals within the sanctuaries. In addition, all permit actions including those addressed in this EA are sent to the NMSP for review if research is to occur in sanctuary waters. In the sanctuaries responses, they requested that PR1 advise the applicants that a multi-sanctuary and monument permit may be required for research conducted in sanctuary waters in addition to sanctuary or monument specific vessel requirements. In the previously cited EA's, NMFS determined that issuance of the permits and conduct of the associated research does not involve alteration of substrate, movement of water or air masses, or other interactions with physical features of ocean and coastal habitat.

Essential fish habitat (EFH) designated for various species of fish, which includes hard and soft bottom substrates is also located throughout the action area. The proposed action is directed at marine mammals and does not alter or affect unique areas, including any components of EFH.

Historic Places, Scientific, Cultural, and Historical Resources
There are no districts, sites, highways or structures listed in or eligible for listing in the National Register of Historic Places in the action area. The proposed action represents non-consumptive use of marine mammals and does not preclude their availability for other scientific, cultural, or historic uses, including subsistence harvest by Alaskan Natives. Thus, effects on such resources will not be considered further.

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

4.0 ENVIRONMENTAL CONSEQUENCES

Effects of the No Action Alternative
There are no direct or indirect effects on the environment of not issuing the permits. The takes of marine mammals, including those listed as threatened or endangered, resulting from the applicants' research would not be exempted. It is unlikely the applicants' would conduct the research in the absence of a permit, because to do so would risk sanctions and enforcement actions.

Effects of the Proposed Permit Alternative
Effects would occur at the time when the applicants' research results in takes of marine mammals, including those listed as threatened or endangered.

The NWFSC, J. Calambokidis, and the Whale Center are current (Permit Nos. 781-1824-02, 540-1811-04, and 532-1822-02) and prior holders of multiple research permits. These requests would allow continuation of ongoing long term research for another 5 years, and authorize the Whale Museum to conduct Level B research activities. The number of animals proposed to be taken annually would be slightly higher than is currently authorized for some species; however the level of effort would not be substantially different. The overall effects of issuing the permits would be similar to the effects of issuing Permit Nos. 781-1824, 540-1811, and 532-1822, and these have all been amended multiple times. An EA of the initial permits and of subsequent major amendments resulted in a FONSI each time. Research activities may result in short-term behavioral responses by individuals, but would not be expected to result in stock- or species-level effects.

Most relevant to this analysis is the potential for negative impacts on the target species. It is important to recognize that an adverse effect on a single individual or a small group of animals does not translate into an adverse effect on the population or species unless it results in reduced reproduction or survival of the individual(s) that causes an appreciable reduction in the likelihood of survival or recovery for the species. In order for the proposed actions to have an adverse effect on a species, the exposure of individual animals to the research activities would first have to result in:

- direct mortality,

- serious injury that would lead to mortality, or

- disruption of essential behaviors such as feeding, mating, or nursing, to a degree that the individual's likelihood of successful reproduction or survival was substantially reduced.

Subsequently, mortality or reduction in an individual's likelihood of successful reproduction or survival would then have to result in a net reduction in the number of individuals of the species. In other words, the loss of the individual or its future offspring would not be offset by the addition, through birth or emigration, of other individuals into the population. That net loss to the species would have to be reasonably expected, directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of the listed species in the wild.

Level B harassment, as defined by the MMPA, would occur during vessel surveys, photo-identification activities, sub-surface observation, breath sampling, acoustic playback, and aerial surveys. The differences in close approach activities requested in the proposed action from what was previously authorized are limited to small increases in the number of animals that would be taken, and would not be expected to have any additional effects that were not analyzed in previous EAs.

Level B harassment from large and small vessel surveys and photo-identification, as described above, would occur concurrently with Level A harassment activities.

Level A harassment, as defined by the MMPA, would occur during tagging activities, biopsy sampling, or ultrasound measurement during which physical contact has the potential to injure animals. Actual injury would be minimized by conditions of the permit limiting how sampling and attachment of tags may occur, such as avoiding sensitive areas of the body. The applicants would also minimize potential disturbance or physical risk by:

- Limiting time spent in the vicinity of target animals and the number of attempts made to obtain breath, biopsy samples, or deploy tags in order to minimize incidental harassment or disturbance from the presence of the small boat or the activities; and

- Sterilizing biopsy tips and dart tags in a multi-step process to minimize the risk of infection.

  All tag types to be used for this action were fully analyzed in the EAs for the SWFSC and Robin Baird, Ph.D. (Permit Nos. 14097 and 15330) (NMFS, 2010a; NMFS, 2011a), a supplemental EA for Brad Hanson, Ph.D. (Permit No. 781-1824-02) (NMFS, 2011b) and two Categorical Exclusion (CE) memos for amendments to Permit No. 731-1774. Findings of No Significant Impact (FONSIs) were issued for the two EA's and one SEA. The effects of the activities were found to be short-term and recoverable with only moderate to minimal reactions, with no observable change in behavior in response to biopsy sampling or tagging and no long term impact or reduction in fecundity expected.

Since these EA's were issued, additional, information has been provided including a report of the first SRKW tagged under Permit No. 781-1824-02 and wound healing updates of non-SRKW's tagged previously:

On February 20th, 2012, NWFSC deployed the first dart tag on a SRKW, an adult Male, J26. On February 23rd, the tag ceased transmitting, indicating, tag failure, breakage, or loss. In an email dated February 24, 2012, the Permit Office reminded NWFSC of the permit condition (see Condition III (B) (1)(g)) that requires the permit holder to cease tagging of SRKW should tag breakage with the broken darts retained in the tagged animal be documented. The Permit Holder must submit a report of the event to NMFS for review and assessment. NWFSC is in the process of obtaining follow up images and confirmation as to the status of the tag. If tag breakage is determined to have occurred, LIMPET tagging of SRKW will cease until further notice.

Separately, at the request of this office, NWFSC provided a follow up report of killer whales LIMPET tagged previously that were the specifically identified during the comment period for Permit No. 781-1824-02. The images provided indicate that healing is progressing as expected and does not deviate from the assessments of tagging risk presented in the Biological Opinions and Environmental Assessments referenced above.

T99A (Tag Loss)

Fig. 4 a. Transient ecotype killer whale T99A thirty-five days after tagging and two days after tag transmission ceased, illustrating fresh exit woulds at barb sites.

Fig. 4 b. Close-up view of T99A exit wounds at barb sites, illustrating extent of tissue extrusion. The open wound does not appear to be infected.

T99A (Transient) Images: Animal tagged on July 25, 2010. *Top Left*: 2 images, tag wound 35 days after tagging (Courtesy of K. Balcomb). *Top Right*: November 15, 2010, approximately 81 days post- tag loss showing advanced stages of healing at the dart penetration sites. Each site is slightly raised and there appears to be a lack of color at the center of the penetration site (Courtesy of K. Balcomb). *Bottom*: July 9, 2011--349 days post tagging. The whale was tagged on the left side dorsal fin and the area of tissue that was involved at the dart penetration sites

appears fully healed with possible small elevated areas and minor discoloration around the dart entry sites (Courtesy of ST Jacobs).

T90 (Tag Breakage and Migration thru Dorsal)

T90 (Female transient): Tagged May 15, 2010. *Top Left*: June 6, 2010, tag body has broken off from both darts (Courtesy of K. Balcomb). *Top Right*: April 15, 2011, loss of skin and exposed tissue on the left side of the dorsal fin opposite of dart insertion locations (Courtesy of G. Ellis). *Bottom Left*: September 5, 2011, 478 days post deployment, the photo shows the opposite side of the dorsal fin from the tagging location. Previous photos had shown this area of the dorsal fin to have early stages of healing tissue. The site now appears healed with some discolored skin and no unhealed tissue present (Courtesy of P. Schulze). *Bottom Right*: February 6, 2012, 632 days post deployment the site of the tissue involved is raised. It is unclear from this photo if the discoloration of the skin has been resolved (Courtesy of J. Hyde).

T123A (Tag Breakage)

T123A (Adult male transient): *Top Left*: Tagged July 29, 2010 (NWFSC). *Top Right*: October 26, 2010, resighted without the transmitter but with the dorsal-most dart still in the fin (NWFSC). The tissue surrounding the dart shaft showed typical inflammation adjacent to the dart post. *Bottom Left*: October 26, 2010, right side of dorsal (NWFSC). *Bottom Middle*: April 2011, dart was still present and with an ongoing tissue response. (Courtesy of G. Ellis). *Bottom Right*: February 2, 2012 -553 days post deployment. Previous photographs indicated a dart remained in the dorsal fin, seen on the left side of the fin. Also present was some discolored skin on the dorsal fin. The above photograph appears to show that the discoloration, at least on the right side of the fin, has resolved. (Courtesy of M. Malleson).

Playback activities have previously been analyzed in the EAs for Permit No. 14534 issued to NMFS, Office of Science and Technology and a batched group of humpback research permits (Nos. 14682, 10018-01, 13846, 14451, 14585, 14599, 14122, 14296, and 14353) (NMFS, 2010b,c) . These analyses resulted in FONSIs for these EAs. The effects of the activities were found to be short-term and recoverable with only moderate to minimal reactions, resulting in transitory and recoverable changes in behavior and physiological parameters of the affected animals, including those listed as threatened or endangered. No measurable effects on populations, stocks, or species are expected. It was also determined that the sound propagation in the water column will not result in impacts on unique or ecologically critical areas.

Cumulative Effects

Cumulative effects are defined as those that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

In general, takes of marine mammals by harassment during permitted research have not been shown to result in long-term or permanent adverse effects on individuals regardless of the number of times the harassment occurs. The frequency and duration of the disturbance under the proposed permit would allow adequate time for animals to recover from any potential adverse effects such that additive or cumulative effects of the action on its own are not expected.

No measurable effects on population demographics are anticipated because any sub-lethal (disturbance) effects are expected to be short-term, and the proposed action is not expected to result in mortality of any animals. There exists the possibility that adverse effects on a species could accrue from the cumulative effects of a large number of permitted takes by harassment relative to the size of a population. However, there is no evidence that current or past levels of permitted takes have resulted in such species-level effects.

Summary of Other Actions

The stocks and populations of marine mammals that are the subject of the permit are exposed to a variety of human activities including: subsistence harvest (gray whales in Washington; Steller sea lions and northern fur seals in Alaska); entanglement in fishing gear; vessel activity including whale watching; and anthropogenic noise from vessels, military and industrial activities. Anthropogenic activities and ecosystem shifts result from climate and oceanographic changes also alter the marine habitat in the action area.

Subsistence: The levels of harvest are managed under various federal and international laws and treaties and are not believed to have an adverse impact on the status of the species.

A gray whale harvest by the Makah Tribe in Washington has not occurred since 2000, and future harvests are subject to obtaining a waiver to the MMPA's take moratorium. Harvest quota levels are set by the International Whaling Commission.

Steller sea lions are the target of a co-managed subsistence harvest in Alaska. The average number of animals struck is 24 animals/year. An unknown number of SSLs from this stock are harvested by subsistence hunters in Canada. The magnitude of the Canadian subsistence harvest is believed to be small.

Northern fur seals are also subject to an annual subsistence harvest in the Pribilof Islands, with an average annual harvest of 562 animals between 2004-2008 (Allen and Angliss, 2010). Illegal intentional killing of northern fur seals by commercial and sport fishers may also occur, but no estimates of the level of mortality exist.

Entanglement: Entanglement in fishing gear and ghost gear is a concern for multiple species in the action area; however, steps taken by NMFS has significantly reduced bycatch and entanglement rates thru use of pingers and gear modifications (Caretta et al., 2010).

Vessel Activity: Many marine mammal populations may be experiencing increased exposure to vessels and associated sounds. Commercial shipping, whale watching, ferry operations, and recreational boating traffic have expanded throughout the action area in recent decades. Commercial fishing boats are also a prominent part of the vessel traffic in many areas. Vessels have the potential to affect marine mammals through their physical presence and activity and the increased underwater sound levels generated by boat engines. Vessel strikes are rare, but do occur and can result in injury or death.

Harassment from whale-watching is not regulated by permits, nor are the effects monitored. The growth of whale watching during the past two decades has meant that whales in some areas (Hawaii, Puget Sound, Monterey Bay) are experiencing increased exposure to vessel traffic and sound. This brings added risk for vessel strikes, displacement from habitat and interference with social interaction and communication (Kovacs and Innes, 1990; Kruse, 1991; Wells and Scott, 1997; Samuels and Bejder, 1998; Bejder et al., 1999; Colborn, 1999; Cope et al., 1999; Mann et al., 2000; Samuels et al., 2000; Boren et al., 2001; Constantine, 2001; Nowacek et al., 2001). Not only do greater numbers of boats accompany the whales for longer periods of the day, but there has also been a gradual lengthening of the viewing season in some areas. For example, the mean number of vessels following groups of southern resident killer whales at any one time during the peak summer months increased from five boats in 1990 to an average of 20 boats from 1998-2009, and individual whales sometimes attract much larger numbers of vessels (Koski, 2010). There is documentation of a whale-boat collision in Haro Strait in 2005 which resulted in a minor injury to a killer whale; and in 2006, killer whale L98 was killed during a vessel interaction. NMFS has issued a final rule to prohibit vessels from approaching killer whales within 200 yards to address this issue. Federal approach regulations are already in place in Hawaii and Alaska for humpback whales, and viewing guidelines for all marine mammal species are established for the Alaska, Northwest, Southwest, and Pacific Islands regions.

There is evidence that anthropogenic noise has substantially increased the ambient level of sound in the ocean over the last 50 years (Andrew et al., 2002, McDonald et al., 2006). Much of this increase is due to increased shipping activity, industrial activity and military operations. Some individuals or populations are regularly exposed to natural and anthropogenic sounds and may

tolerate, or have become habituated to, certain levels of noise exposure (Richardson, 1995). The net effect of disturbance is dependent on the size and percentage of the population affected, the ecological importance of the disturbed area to the animals, and their behavioral plasticity (Geraci and St. Aubin, 1980).

The military uses acoustics to test the construction of new vessels as well as for naval operations in the Gulf of Alaska Temporary Maritime Activities Area and Northwest Training Range Complex, Hawaii Range Complex, Southern California Range Complex, and Mariana Islands Range Complex.

In some areas where industrial and commercial activity takes place, noise originates from the infrastructure construction, equipment operation, and vessel and aircraft support. Many researchers have described the behavioral responses of marine mammals to sounds produced by helicopters and fixed-wing aircraft, boats and ships, as well as dredging, construction, and geological explorations (Richardson, 1995; Nowacek et al., 2007). Most observations have been limited to short-term behavioral responses, which included cessation of feeding, resting, or social interactions. Several studies have demonstrated the short-term effects of disturbance on humpback whale behavior (Hall, 1982; Baker et al., 1983; Krieger and Wing, 1984; Bauer and Herman, 1986, Miller et al., 2000), but the long-term effects, if any, are unclear or not detectable. Actions such as repair of bridges and ports, as well as explosive removal of structures have been analyzed previously and been found to have a negligible impact on marine mammal stocks.

Contaminants: Human actions, such as emitting discharge from wastewater facilities, dredging, ocean dumping and disposal, aquaculture, and coastal development are known to have deleterious impacts on marine mammals and their prey's habitat, ultimately affecting the animals themselves as contaminants are bioaccumulated. Point source pollutants from coastal runoff, at sea disposal of dredged material and sewage effluents, oil spills, as well as substantial commercial and recreational vessel traffic and impacts of fishing operations continue to negatively affect marine mammals in the proposed action areas.

Climate Change: The extent to which climate and/or ecosystem changes impact the target cetacean species is largely unknown. However, NMFS recognizes that such impacts may occur based on the biology, diet, and foraging behavior of dolphins and whales. Inter-annual, decadal, and longer time-scale variability in climate can alter the distribution and biomass of prey available to large whales. The effects of climate-induced shifts in productivity, biomass, and species composition of zooplankton on the foraging success of planktivorous whales have received little attention. Such shifts in community structure and productivity may alter the distribution and occurrence of foraging whales in coastal habitats and affect their reproductive potential as well. Similar shifts in prey resources could likewise impact large whales if climate change alters the density, distribution, or range of prey.

Incidental Harassment Authorizations (IHAs): In addition to scientific research permits, NMFS issues Letters of Authorization (LOAs) and IHAs, under the MMPA (Section 101.A.5) for the incidental take of marine mammals. NMFS has issued eight IHAs, and eleven LOAs for the take of multiple target species in the action area.

Other Scientific Research Permits and Authorizations: The number of scientific research permits and associated takes by harassment indicate a high level of research effort of some endangered marine mammal species in the proposed action area. This is due, in part, to intense interest in developing appropriate management and conservation measures to recover these species. Given the number of permits, associated takes and research vessels and personnel present in the environment, repeated disturbance of individual large whales is likely to occur in some instances, particularly in coastal areas (due to the proximity to shore). It is difficult to assess the effects of such disturbance. However, NMFS has taken steps to limit repeated harassment and avoid unnecessary duplication of effort through permit conditions requiring coordination among permit holders. NMFS expects that the temporary harassment of individuals would dissipate within minutes, and therefore animals would recover before being targeted for research by another Permit Holder. NMFS would continue to monitor the effectiveness of these conditions in avoiding unnecessary repeated disturbances.

A total of 59 permits and Letters of Confirmation (LOC) authorize the harassment of one or more of the cetacean or pinniped species targeted or incidentally taken in the proposed action area (Appendix B). Nearly all the permits authorize a smaller study area or region within the Pacific Ocean basin, reducing the chance of repeated harassment of individual whales by researchers. Most of this research does not overlap in area or timing. Some spatial overlap exists for research on species with known feeding or breeding grounds, such as humpback whales. The majority of the takes authorized by these permits are for Level B harassment that would result in no more than temporary disturbance to the target species. LOCs are issued under the General Authorization and confirm that the research would result in no more than Level B harassment of non-ESA marine mammals.

A few of the permits are currently operating under a one-year extension (Appendix B); which allows permitted activities for an additional 12 months. A few of the active permits will expire before these permits can be issued. NMFS expects that some researchers, such as NMFS Science Centers, which are mandated to assess the status of U.S. marine mammal stocks, will request new permits, or renewals, to continue their work once the current permit expires. NMFS cannot predict with certainty the level of take of each species that may be requested in the future but, conservatively, expects the amount of future research to be similar to or slightly greater than current levels as interest in marine conservation, biology, and management of these species grows.

None of the active research permits authorize activities likely to result in the serious injury or mortality of any animal. Further, no such incidences of serious injury or mortality have been reported by permitted cetacean researchers. Therefore, the number of takes proposed by the applicants is not expected to result in a significant adverse impact on the target species, especially considering the majority of the takes are already authorized in three of the applicants' current permits. In addition, all permits issued by NMFS for research on protected species, including the proposed permits, contain conditions requiring the Permit Holders to coordinate their activities with the NMFS regional offices and other Permit Holders conducting research on the same species in the same areas, and, to the extent possible, share data to avoid unnecessary duplication of research and disturbance of animals.

It is also important to note that many of the target whales are migratory and may transit in and out of U.S. waters and the high seas. NMFS does not have jurisdiction over the activities of individuals conducting field studies in other nations' waters, and cumulative effects from all scientific research on these species across the Proposed Action area cannot be fully assessed. However, where possible, NMFS attempts to collaborate with foreign governments to address management and conservation of these trans-boundary species.

Summary of Cumulative Effects

There may already be significant adverse impacts on marine mammals from the existing levels of human activities. However, the relative incremental effect of the proposed action would not be significant. The proposed takes of specified numbers of marine mammals by harassment during the life of the permits are not likely to contribute to collectively significant adverse impacts on marine mammal stocks or species, including those listed as threatened or endangered. The effects of the takes would be transitory and recoverable, associated with only minor and short-term changes in the behavior of a limited number of individual marine mammals.

Although the effects of repeated or chronic disturbance from scientific research activities should not be dismissed, the potential long-term benefits and value of information gained on these species also must be considered. The proposed research would provide valuable information on these species' biology and ecology that in turn may be used to improve their management and reduce the effects of human activities on these populations.

5.0 MITIGATION MEASURES

There are no additional mitigation measures beyond those that are part of the applicant's protocols or conditions that would be required by permit, as discussed in the description of the Proposed Permit Alternative. The applicants' protocols are incorporated into the permits by reference.

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

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

6.0 LIST OF PREPARERS AND AGENCIES CONSULTED

Prepared By

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

7.0 LITERATURE CITED

Allen, B.M. and R.P. Angliss. 2011. Alaska marine mammal stock assessments, 2010. U.S. Dep. Commer., NOAA Tech. Memo. NMFS AFSC-223.

Allen, B.M. and R.P. Angliss. 2010. Alaska marine mammal stock assessments, 2009. U.S. Dep. Commer., NOAA Tech. Memo. NMFS AFSC-206, 287 pp.

Andrew, R. K., B. M. Howe, and J. A. Mercer. 2002. Ocean ambient sound: comparing the 1960s with the 1990s for a receiver off the California coast. Acoustics Research Letters Online 3(2):65-70.

Andrews, R.D.,R.L. Pitman, and L.T. Balance. 2008. Satellite tracking reveals distinct movement patterns for Type B and Type C killer whales in the southern Ross Sea, Antarctica. Polar Biol. 31:1461-1468.

Baird, R.W., A.M. Gorgone, D.L. Webster, D.J. McSweeney, J.W. Durban, A.D. Lignon, D.R. Salden, and N.H. Deakos. 2005. False killer whales around the main Hawaiian Islands: An assessment of inter-island movements and population size using individual photo-identification. (Pseudorca crassidens). Report prepared under Order No. JJ133F04SE0120 from the Pacific Islands Fisheries Science Center, National Marine Fisheries Service, 2570 Dole Street, Honolulu, HI 96822. 24pgs. 2005.

Baird, R.W., G.S. Schorr, D.L. Webster, D.J. McSweeney, M.B. Hanson and R.D. Andrews. 2010. Movements and habitat use of satellite-tagged false killer whales around the main Hawaiian Islands. Endangered Species Research 10:107-121.

Baker, C.S., L.M. Herman, B.G. Bays and G.B. Bauer. 1983. The impact of vessel traffic on the behavior of humpback whales in southeast Alaska: 1982 season. Report submitted to the National Marine Mammal Laboratory, Seattle, WA. 78 pp.

Baker, C.S., S.R. Palumbi, R.H. Lambertsen, M.T. Weinrich, J. Calambokidis, and S.J. O'Brien. 1990. Influence of seasonal migration on geographic distribution of mitochondrial DNA haplotypes in humpback whales. Nature 344:238-240.

Barlow, J. 1994. Abundance of large whales in California coastal waters: a comparison of ship surveys in 1979/80 and in 1991. Rep. Int. Whal. Comm. 44:399-406.

Barlow, J. 2003. Cetacean abundance in Hawaiian waters during summer/fall 2002. Administrative Report. La Jolla, CA, Southwest Fisheries Science Center. 22 pp.

Barlow, J. 2006. Cetacean abundance in Hawaiian waters estimated from a summer/fall survey in 2002. Mar. Mamm. Sci. 22(2):446-464.

Barlow, J. 2010. Cetacean abundance in the California Current from a 2008 ship-based line-transect survey. NOAA Technical Memorandum, NMFS, NOAA-TM-NMFS-SWFSC-456.

Bauer, G.B. and L.M. Herman. 1986. Effects of vessel traffic on the behavior of humpback whales in Hawaii. Report Submitted to NMFS Southwest Region, Western Pacific Program Office, Honolulu, HI. 151 pp.

Bejder, L., S.M. Dawson, and J.A. Harraway. 1999. Responses by Hector's dolphins to boats and swimmers in Porpoise bay, New Zealand. Mar. Mamm. Sci., 15(32):738-750.

Berzin, A. A., and A. A. Rovnin. 1966. The distribution and migrations of whales in the northeastern part of the Pacific, Chukchi and Bering seas. Pages 103-136 in K.1. Panin, ed. Soviet research on marine mammals in the far east.

Boren, L.J., N.J. Gemmell, and K. Barton. 2001. Controlled approaches as an indicator of tourist disturbance on New Zealand Fur Seals (Arctocephalus forsteri). Page 23 in Abstracts of the Southern Hemisphere Marine Mammal Conference 2001, Victoria, Australia, May 29-June 1, 2001.

Calambokidis, J., G.H Steiger, J.C. Cubbage, K.C. Balcomb, C. Ewald, S. Kruse, R. Wells, R. Sears. 1990. Sightings and movements of blue whales off central California 1986-88 from photo-identification of individuals. Rep. Int. Whal. Comm. Special Issue (12):343-348.

Calambokidis, J., G.H. Steiger, and J.R. Evenson. 1993. Photo-id and abundance estimates of humpback and blue whales off California in 1991-92. Final Contract Report 50ABNFI00137 to Southwest Fisheries Science Center, P.O. Box 271, LaJolla, CA 92038. 67pp.

Calambokidis, 1., G.H. Steiger, J.M. Straley, T.J. Quinn II, L.M. Herman, S. Cerchio, D.R. Salden, M. Yamaguchi, F. Sato, 1. Urban R., J. Jacobsen, O. von Ziegesar, K.C. Balcomb, C.M. Gabriele, M.E. Dahlheim, M. Higashi, S. Uchida, J.K.B. Ford, Y. Miyamura, P. Ladron de Guevara P., S.A Mizroch, L. Schlender and K. Rasmussen. 1997. Abundance and population structure of humpback whales in the North Pacific Basin. Report to Southwest Fisheries Science Center, National Marine Fisheries Service, La Jolla, California. 71pp.

Calambokidis, J. 2003. Underwater behavior of blue whales examined with suction-cup attached tags. Annual Report to Office of Naval Research for Grant Number: N00014-02-1-0849. 6pp.

Calambokidis, J. and J. Barlow. 2004. Abundance of blue and humpback whales in the eastern North Pacific estimated by capture-recapture and line-transect methods. Mar. Mamm. Sci. 20(1):63-85.

Calambokidis, J., E.A. Falcone, T.J. Quinn, A.M. Burdin, P.J. Clapham, J.K.B. Ford, C.M. Gabriele, R. LeDuc, D. Matilla, L. Rojas-Bracho, J.M. Straley, B.L. Taylor, J. Urbán, D. Weller, B.H. Witteveen, M. Yamaguchi, A. Bendlin, D. Camacho, K. Flynn, A. Havron, J. Huggins, and N. Maloney. 2008. SPLASH: Structure of Populations, Levels of Abundance and Status of Humpback Whales in the North Pacific. Final report for Contract AB133F-03-RP-00078. 57 pp.

Carretta, 1.V. K.A Forney, M.S. Lowry, J. Barlow, J. Baker, D. Johnston, B. Hanson, R.L. Brownell Jr., J. Robbins, D.K. Matilla, K. Ralls, M.M. Muto, D. Lynch, and L. Carswell. 2009. U.S. Pacific Marine Mammal Stock Assessments: 2009. NOAA-TM-NMFSSWFSC-453. 341 pp.

Carretta, J.V. K.A. Forney, E. Oleson, K. Martien, M.M. Muto, M.S. Lowry, J. Barlow, J. Baker, B. Hanson, D. Lynch, L. Carlswell, R.L. Brownell Jr., J. Robbins, D.K. Matilla, K. Ralls, M.C. Hill. 2010. Draft U.S. Pacific Marine Mammal Stock Assessments: 2010. NOAA-TM-NMFS-SWFSC-xxx. 307 pp.

Colborn, K. 1999. Interactions between humans and bottlenose dolphins, *Tursiops truncates*, near Panama City, Florida. Master's Thesis, Duke University, Durham, NC. 45pp.

Constantine, R. 2001. Increased avoidance of swimmers by wild bottlenose dolphins (Tursiops truncates) due to long-term exposure to swim-with-dolphin tourism. Mar. Mamm. Sci., 17(4):689-702.

Croll, D. A., C.W. Clark, J. Calambokidis, W.T. Ellison, and B.R. Tershy. 2001. Effect of anthropogenic low-frequency noise on the foraging ecology of Balaenoptera whales. Animal Conservation 4: 13-27.

Cope, M., D. St. Aubain, and J. Thomas. 1999. The effect of boat activity on the behavior of bottlenose dolphins (*Tursiops truncates*) in the nearshore waters of Hilton Head, South Carolina. Page 37 in Abstracts of the 13th Biennial Conference on the Biology of Marine Mammals, Wailea, Hawaii, November 38-December 3, 1999.

Darling, J.D. 1991. Humpback whales in Japanese waters. Ogasawara and Okinawa. Fluke identification catalog 1987-1990. Final Contract Report, World Wide Fund for Nature, Japan. 22pp.

Dohl, T. P., R. C. Guess, M. L. Duman, and R. C. Helm. 1983. Cetaceans of central and northern California, 1980-83: Status, abundance, and distribution. Final Report to the Minerals Management Service, Contract No. 14-12-0001-29090. 284pp.

Fearnbach, H., Durban, J. W., Ellifrit, D. K., Balcomb, K. C. I. 2011. Size and long-term growth trends of Endangered fish-eating killer whales. Endangered Species Research. 13, 173-180.

Forney, K.A., J. Barlow, and J. Carretta. 1995. The abundance of cetaceans in California waters. Part II: Aerial surveys in winter and spring of 1991 and 1992. Fish. Bull. 93:1526.

Forney, K.A. 2007. Preliminary estimates of cetacean abundance along the U.S. west coast and within four National Marine Sanctuaries during 2005. U.S. Department of Commerce NOAA Technical Memorandum, NOAA-TM-NMFS-SWFSC-406. 27p.

Geraci, J.R. and D.J. St. Aubin. 1980. Offshore petroleum resource development and marine mammals: A review and research recommendations. Mar. Fish. Rev. 42:11: 1-12.

Green, G.A., J.J. Brueggeman, R.A. Grotefendt, C.E. Bowlby, M.L. Bonnell, K.C. Balcomb, III. 1992. Cetacean distribution and abundance off Oregon and Washington, 1989-1990. Ch. 1 In: J.J. Brueggeman (ed.). Oregon and Washington Marine Mammal and Seabird Surveys. Minerals Management Service Contract Report 14-12-0001-30426.

Hall, J.D. 1982. Prince William Sound, Alaska: Humpback whale population and vessel traffic study. Final Report, Contract No. 81-ABG-00265. NMFS, Juneau Management Office, Juneau, Alaska. 14 pp.

Lerczak, James A., K.E.W. Shelden, and R.C. Hobbs. 2000. Application of suction-cup-attached VHF transmitters to the study of beluga, Delphinapterus leucas, surfacing behavior in Cook Inlet, Alaska. Marine Fisheries Review 62(3):99-111.

Koski, K. 2010. 2010 Soundwatch Program Annual Report: Soundwatch Public Outreach/Boater Education Project. The Whale Museum, Friday Harbor, Washington. 75 pp.

Kovacs, K.M. and S. Innes. 1990. The impact of tourism on harp seals (*Phoca groenlandica*) in the gulf of St. Lawrence, Canada. Applied Animal Behaviour Science, 26:15-26.

Krieger, K. and B.L. Wing. 1984. Hydroacoustic surveys and identifications of humpback whale forage in Glacier Bay, Stephens Passage, and Frederick Sound, southeastern Alaska, Summer 1983. NOAA Tech. Memo. NMFS/NWC-66. 60 pp.

Kruse, S. 1991. The interactions between killer whales and boats in Johnstone Strait, RC. pages 149-159 in K. Pryor and K.S. Norris, eds. Dolphin Societies -Discoveries and Puzzles. University of California Press, Berkeley, CA.

Mann, J., R.C. Connor, L.M. Barre, and M.R. Heithaus. 2000. Female reproductive success in wild bottlenose dolphins (*Tursiops sp.*): Life history, habitat, provisioning, and group size effects. Behavioral Ecology, 11:210-219.

McDonald, M.A., J.A. Hildebrand, and S.E. Wiggins. 2006. Increases in deep ocean ambient noise in the Northeast Pacific west of San Nicolas Island, California. J. Acoust. Soc. Am. 120(2):711-718.

Miller, P. J.O., N. Biassoni, A. Samuels, and P.L. Tyack. 2000. Whale songs lengthen in response to sonar. Nature 405(6789):903-904.

Moore, M.J., C. A. Miller, M. S. Morss, R. Arthur, W. A. Lange, K. G. Prada, M. K. Marx, and E. A. Frey. 2001. Ultrasonic measurement of blubber thickness in right whales. Journal of Cetacean Research and Management. 2:301-309.

Nishiwaki, M. 1966. Distribution and migration of the larger cetaceans in the North Pacific as shown by Japanese whaling results. Whales, Dolphins and Porpoises. Berkeley, University of California Press: 171-191.

NMFS. 2004. A requirements plan for improving the understanding of the status of U.S. Protected Marine Species. Report of the NOAA Fisheries National Task Force for Improving Marine Mammal and Turtle Stock Assessments. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-63, 112 p.

NMFS 2004. Environmental Assessment on the Effects of the Issuance of Eleven National Marine Fisheries Service Permitted Scientific Research Activities on Marine Mammal and Sea Turtle Species in the U.S. Territorial Waters and High Seas of the North Pacific Ocean (including the Gulf of Alaska and Bering Sea), Arctic Ocean (including the Chukchi Sea and Beaufort Sea), Southern Ocean (including waters off Antarctica), and Foreign Territorial Waters of Mexico (Gulf of California only), Canada, Russia, Japan and the Philippines. National Marine Fisheries Service, Silver Spring, MD.

NMFS 2004. Supplemental Environmental Assessment on the Effects of the Issuance of Nine National Marine Fisheries Service Permit Actions for Scientific Research Activities on Marine Mammal Species in the U.S. Territorial Waters and High Seas of the Eastern, Central, and Western North Pacific Ocean, with a Primary Focus on the Waters Off Hawaii and from California Northward to Southeast Alaska (Including Gulf of Alaska and Aleutian Islands), and Including Foreign Territorial Waters of Japan. National Marine Fisheries Service, Silver Spring, MD.

NMFS 2006a. Environmental Assessment on the Effects of the Issuance of Four National Marine Fisheries Service Scientific Research Permits and Three Permit Amendments on the Eastern North Pacific Southern Resident Killer Whale (Orcinus orca) and Other Marine Mammals in the U.S. Territorial Waters, Exclusive Economic Zones, and High Seas of the Eastern North Pacific Ocean along the Coast of the U.S. from Southeastern Alaska to Central California, and Coastal Inlets and Estuaries of These States. National Marine Fisheries Service, Silver Spring, MD.

NMFS. 2006b. Draft Revised Recovery Plan for the Steller sea lion (Eumetopias jubatus). National Marine Fisheries Service Alaska Region. Juneau, AK. 285.

NMFS. 2007. Programmatic Environmental Impact Statement (PEIS) for Research on Steller Sea Lions and Northern Fur Seals. National Marine Fisheries Service, Silver Spring, MD.

NMFS. 2008. Recovery Plan for Southern Resident Killer Whales (Orcinus orca). National Marine Fisheries Service, Northwest Regional Office. Seattle, Washington.

NMFS, 2010a. Environmental Assessment on the Effects of the Issuance of a Scientific Research Permit [File No. 14097] for Pinniped, Cetacean, and Sea Turtle Studies. Silver Spring, MD.

NMFS, 2010b. Environmental Assessment on the Effects of Scientific Research Activities Associated with Behavioral Response Studies of Pacific Marine Mammals Using Controlled Sound Exposure. [File No. 14534]. Silver Spring, MD.

NMFS, 2010c. Environmental Assessment for The Issuance of Scientific Research Permits for Research on Humpback Whales and Other Cetaceans. July 2010. Silver Spring, MD.

NMFS, 2011a. Environmental Assessment for Issuance of a Scientific Research Permit for Cetacean Studies. [File No. 15330]. Silver Spring, MD.

NMFS, 2011b. Supplemental Environmental Assessment On The Effects Of Issuance Of A Scientific Research Permit Amendment For Research On The Eastern North Pacific Southern Resident Killer Whale (Orcinus Orca) Permit No. 781-1824-02. Silver Spring, MD.

Nowacek, S.M., R.S. Wells, and A.R. Solow. 2001. Short-term effects of boat traffic on bottlenose dolphins, *Tursiops truncatus*, in Sarasota Bay, FL. Mar. Mamm. Sci., 17(4):673-688.

Nowacek, D.P., L.H. Thorne, D.W. Johnston, and P.L. Tyack. 2007. Responses of cetaceans to anthropogenic noise. Mammal Review 37(2):81-115.

Perry, A, C.S. Baker, and L.M. Herman.1990. Population characteristics of individually identified humpback whales in the central and eastern North Pacific: A summary and critique. (Megaptera novaeangliae). Report of the International Whaling Commission Special Issue 12:307-317.

Richardson, W. J., C.R. Greene Jr., C.I. Malme, and D.H. Thomson. 1995. Marine mammals and noise. San Diego, CA: Academic Press, Inc.

Samuels, A. and L. Bejder. 1998. Habitual interactions between humans and wild bottlenose dolphins (*Tursiops truncatus*) near Panama City Beach, Florida. Report to the Marine Mammal Commission, Silver Spring, MD. 13 pp.

Samuels, A., L. Bejder, and S. Heinrich. 2000. A Review of the Literature Pertaining to Swimming with Wild Dolphins. Report to the Marine Mammal Commission. 57 pp.

Schorr, G.S., R.W. Baird, M.B. Hanson, D.L. Webster, D.J. McSweeney and R.D. Andrews. 2009. Movements of satellite-tagged Blainville's beaked whales off the island of Hawai‘i. Endangered Species Research 10:203-213.

Southall, B. L. , A. E. Bowles, W. T. Ellison, J. J. Finneran, R. L. Gentry, C. R. Green Jr., D. Kastak, D.R. Ketten, J. H. Miller, P. E. Nachtigall, W. J. Richardson, J. A. Thomas, and P. L. Tyack. 2007. Marine mammal noise exposure criteria: Initial scientific recommendations. Aquatic Mammals 33, 414-521.

Szymanski, M. D., D. E. Bain, K. Kiehl, S. Pennington, S. Wong, and K. R. Henry. 1999. Killer whale (Orcinus orca) hearing: Auditory brainstem response and behavioral audiograms. J. Acoust. Soc. Am. 106, 1134-1141.

Steiger, G.H., J. Calambokidis, R. Sears, K.C. Balcomb, and IC. Cubbage. 1991. Movement of humpback whales between California and Costa Rica. Mar. Mammal Sci. 7:306-310.

Wade, P. R., A. Kennedy, R. Leduc, J. Barlow, J. Carretta, K. Shelden, W. Perryman, R. Pitman, K. Robertson, B. Rone, J.C. Salinas, A. Zerbini, R.L. Brownell Jr., and P.J. Clapham. 2011. The world's smallest whale population? Biology Letters 7(1):83-85.

Wade, P., M.P. Heide-Jorgensen, K. Shelden, J. Barlow, 1. Carretta, J. Durban, R. LeDuc, L. Munger, S. Rankin, A. Sauter and C. Stinchcomb. 2006. Acoustic detection and satellite-tracking leads to discovery of rare concentration of endangered North Pacific right whales. Biology Letters 2: 417-419.

Wells, R.S. and M.D. Scott. 1997. Seasonal incidence of boat strikes on bottlenose dolphins near Sarasota, Florida. Mar. Mamm. Sci., 13(3):475-480.

Witteveen, B.H., R.J. Foy, K.M. Wynne, and Y. Tremblay.2008. Investigation of foraging habits and prey selection by humpback whales (Megaptera novaeangliae) using acoustic tags and concurrent fish surveys. Marine Mammal Science 24(3):516-534.

Appendix A : Active Scientific Research Permits and General Authorizations In the Action Area

Permit No.	Permit Holder	Expiration date	Location	Harassment
Cetaceans Permits				
369-1757-01*	Mate	Until new Permit Issued	AK, WA,OR, CA	Level A & B
717-1909	Ostman-Lind	3/31/2012	HI	Level B only
727-1915	Scripps Institute of Oceanography	2/1/2013	WA, OR, CA, HI	Level A & B
881-1918	ASLC	5/15/2012	AK	Level B only
1058-1733-01	Baumgartner	5/31/2012	AK	Level A & B
1120-1898	Eye of the Whale	7/31/2012	AK	Level B only
1127-1921	Hawaii Marine Mammal Consortium	6/30/2013	HI	Level A & B
10018	Cartwright	6/30/2013	HI	Level B only
10045	Wasser	7/15/2013	WA	Level B only
13430	NMFS NMML	1/31/2015	OR, WA	Level A & B
13427	PWF	6/15/2013	HI	Level B only
13846	Whale Trust/Darling	7/31/2015	AK, WA, HI	Level A & B
14097	NMFS, SWFSC	6/30/2015	AK, WA, OR, CA , HI	Level A & B

Permit No.	Permit Holder	Expiration date	Location	Harassment
14122	Straley	7/31/2015	AK	Level A & B
14227	ABR	2/17/2014	AK	Level B only
14245	NMFS, NMML	5/1/2016	AK, WA, OR, CA	Level A & B
14296	Witteveen	7/31/2015	AK	Level A & B
14353	Zoidis	7/31/2015	HI	Level A & B
14451	University of Hawaii at Manoa	7/31/2015	AK, WA, OR, CA , HI, CNMI	Level B only
14534	NOAA S&T	7/31/2015	CA	Level A & B
14585	Pack	7/31/2015	AK, HI	Level A & B
14599	Sharpe	7/31/2015	AK	Level A & B
14682	Au	11/15/2015	HI	Level A & B
15271	Harvey	3/31/2016	WA, OR, CA	Level A & B
15274	Salden	11/15/2016	HI, AK	Level B only
15330	Baird	8/1/2016	AK, WA, OR, CA , HI, CNMI	Level A & B
15409	Johnston	6/15/2015	HI	Level B only
15477	Szczepaniak	7/31/2015	CA	Level B only
15483	Mate	12/31/2015	OR	Level B only

Permit No.	Permit Holder	Expiration date	Location	Harassment
15616	Matkin	2/28/2016	AK	Level A & B
15621	Stap	6/15/2016	CA	Level B only
15639	Smultea	12/15/2014	CA	Level B only
15844	Glacier Bay National Park and Preserve	2/28/2017	AK	Level A & B
16183	Maldini	2/29/2016	CA	Level B only
16381	Bearzi	5/31/2016	CA	Level B only
16685	Jefferson	1/1/2017	CA	Level A & B
Pinniped Permits				
87-1851	Costa	12/31/2012	CA	Level A & B
373-1868	Point Reyes Bird Observatory	4/15/2012	CA	Level A & B
486-1790	Stewart	10/1/2011	CA	Level A & B
555-1870	Harvey	4/15/2012	AK, WA, OR, CA	Level A & B
10137	PIFSC	6/30/2014	HI	Level A & B
14197	Vandenberg Airforce Base	6/30/2014	CA	Level A & B
14324	Alaska SeaLife Center	8/31/2014	AK	Level A & B
14325	Alaska DFG	8/31/2014	AK	Level A & B

Permit No.	Permit Holder	Expiration date	Location	Harassment
14326	NMFS NMML	8/31/2014	AK, WA, OR, CA	Level A & B
14327	NMFS National Marine Mammal Laboratory (NMML)	8/31/2014	AK, CA	Level A & B
14328	Alaska SeaLife Center	8/31/2014	AK	Level A & B
14329	North Pacific Universities Marine Mammal Research Consortium	8/31/2014	AK	Level A & B
14330	Aleut Community of St. Paul Island	8/31/2014	AK	Level A & B
14331	Aleut Community of St. George Island	8/31/2014	AK	Level A & B
14335	Alaska SeaLife Center	8/31/2014	AK	Level A & B
14336	Markus Horning	8/31/2014	AK	Level A & B
14337	Andrew Trites, Ph.d.	8/31/2014	AK	Level A & B
14590	NMML	8/1/2014	AK	Level B only
14636	Costa	6/30/2015	CA	Level A & B
14676	Ponganis	2/01/2015	CA	Level A & B
16087	NMFS NMML	6/30/2016	WA, OR, CA	Level A & B
16094	ADFG	12/31/2016	AK	Level A & B
16553	Hubbs SeaWorld	10/31/2016	CA	Level A & B

* indicates that there is a one-year extension on the permit

Attachment 1a. File No. 16163 [NWFSC] Authorized Annual Takes in the Pacific Ocean (WA, OR, CA, HI, AK, High Seas North Pacific Ocean)

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 10 may receive dart/barb tags; up to 10 may receive both.
Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	All	200	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	All	200	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, fin	Range-wide (NMFS Endangered)	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, fin	Range-wide (NMFS Endangered)	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 20 may receive dart/barb tags; up to 10 may receive both.
Whale, fin	Range-wide (NMFS Endangered)	Adult/ Juvenile	5	1	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, fin	Range-wide (NMFS Endangered)	All	500	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	other=non-audible acoustic imaging
Whale, fin	Range-wide (NMFS Endangered)	All	500	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, sei	Range-wide (NMFS Endangered)	All	500	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, sei	Range-wide (NMFS Endangered)	All	500	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, Bryde's	Range-wide	All	500	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, Bryde's	Range-wide	All	500	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, humpback	Range-wide (NMFS Endangered)	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, humpback	Range-wide (NMFS Endangered)	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV
Whale, humpback	Range-wide (NMFS Endangered)	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 10 may receive dart/barb tags; up to 10 may receive both.

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, humpback	Range-wide (NMFS Endangered)	All	5	3	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast
Whale, humpback	Range-wide (NMFS Endangered)	All	500	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=non-audible acoustic imaging
Whale, humpback	Range-wide (NMFS Endangered)	All	500	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, right, North Pacific	Eastern North Pacific Stock (NMFS Endangered)	All	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, right, North Pacific	Eastern North Pacific Stock (NMFS Endangered)	All	10	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, unidentified baleen	NA	All	500	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, unidentified baleen	NA	All	500	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, sperm	Range-wide (NMFS Endangered)	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, sperm	Range-wide (NMFS Endangered)	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry;	Up to 10 may receive suction cup tags; Up to 10 may receive dart/barb tags; up to 10 may receive both.

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
						Photograph/Video; Sample, fecal ; Tracking	
Whale, sperm	Range-wide (NMFS Endangered)	All	250	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, sperm	Range-wide (NMFS Endangered)	All	250	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, killer	Eastern North Pacific Offshore Stock	Adult/ Juvenile	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Offshore Stock	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV
Whale, killer	Eastern North Pacific Offshore Stock	Adult/ Juvenile	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 15 may receive dart/barb tags; up to 10 may receive both.
Whale, killer	Eastern North Pacific Offshore Stock	All	100	3	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Offshore Stock	All	250	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=non-audible acoustic imaging
Whale, killer	Eastern North Pacific Offshore Stock	All	250	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, killer	West Coast Transient Stock	Adult/ Juvenile	50	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, killer	West Coast Transient Stock	Adult/ Juvenile	50	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	West Coast Transient Stock	Adult/ Juvenile	100	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 50 may receive suction cup tags; Up to 50 may receive dart/barb tags; up to 10 may receive both.
Whale, killer	West Coast Transient Stock	All	25	3	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast
Whale, killer	West Coast Transient Stock	All	200	25	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=non-audible acoustic imaging
Whale, killer	West Coast Transient Stock	All	200	25	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	West Coast Transient Stock	Adult/ Juvenile	50	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking; Ultrasound	
Whale, killer	Eastern North Pacific Alaska Resident Stock	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, killer	Eastern North Pacific Alaska Resident Stock	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Alaska Resident Stock	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 20 may receive dart/barb tags; up to 10 may receive both.
Whale, killer	Eastern North Pacific Alaska Resident Stock	All	200	10	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, killer	Eastern North Pacific Alaska Resident Stock	All	200	10	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, killer	Eastern North Pacific Alaska Resident Stock	Adult/ Juvenile	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking; Ultrasound	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Northern Resident Stock	Adult/ Juvenile	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, killer	Eastern North Pacific Northern Resident Stock	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV
Whale, killer	Eastern North Pacific Northern Resident Stock	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 20 may receive dart/barb tags; up to 10 may receive both.

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Northern Resident Stock	All	50	3	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast
Whale, killer	Eastern North Pacific Northern Resident Stock	All	100	10	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=non-audible acoustic imaging
Whale, killer	Eastern North Pacific Northern Resident Stock	All	100	10	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	Adult/ Juvenile	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	Adult/ Juvenile	50	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	Adult/ Juvenile	39	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 30 may receive suction cup tags; Up to 9 may receive dart/barb tags; up to 9 may receive both.
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	Adult/ Juvenile	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking; Ultrasound	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	All	130	5	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Directed playback
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	All	750	5	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	All	6000	60	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=non-audible acoustic imaging
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	All	6000	60	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	Hawaiian Stock	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=non-audible acoustic imaging
Whale, killer	Hawaiian Stock	All	100	10	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, killer	Range-wide	Adult/ Juvenile	50	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=non-audible acoustic imaging

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, killer	Range-wide	All	100	10	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	other=non-audible acoustic imaging
Whale, minke	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, minke	Range-wide	Adult/ Juvenile	35	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 15 may receive suction cup tags; Up to 20 may receive dart/barb tags; up to 10 may receive both.

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, minke	Range-wide	Adult/ Juvenile	5	10	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast
Whale, minke	Range-wide	All	50	15	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	other=non-audible acoustic imaging
Whale, minke	Range-wide	All	50	15	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, gray	Eastern North Pacific	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, gray	Eastern North Pacific	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV
Whale, gray	Eastern North Pacific	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 10 may receive dart/barb tags; up to 10 may receive both.
Whale, gray	Eastern North Pacific	Adult/ Juvenile	5	1	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast
Whale, gray	Eastern North Pacific	All	100	15	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=non-audible acoustic imaging

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, gray	Eastern North Pacific	All	100	15	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, pygmy sperm	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, pygmy sperm	Range-wide	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 20 may receive suction cup tags; Up to 10 may receive dart/barb tags; up to 10 may receive both.
Whale, pygmy sperm	Range-wide	All	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, pygmy sperm	Range-wide	All	25	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, dwarf sperm	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, dwarf sperm	Range-wide	Adult/ Juvenile	40	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 20 may receive suction cup tags; Up to 20 may receive dart/barb tags; up to 10 may receive both.
Whale, dwarf sperm	Range-wide	All	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, dwarf sperm	Range-wide	All	25	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, Baird's beaked	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, Baird's beaked	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 10 may receive dart/barb tags; up to 10 may receive both.
Whale, Baird's beaked	Range-wide	All	200	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, Baird's beaked	Range-wide	All	200	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, Cuvier's beaked	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, Cuvier's beaked	Range-wide	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 20 may receive dart/barb tags; up to 10 may receive both.
Whale, Cuvier's beaked	Range-wide	All	200	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, Cuvier's beaked	Range-wide	All	200	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, Stejneger's beaked	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, Stejneger's beaked	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, Stejneger's beaked	Range-wide	All	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, Stejneger's beaked	Range-wide	All	30	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, Mesoplodon beaked	California/Oregon/Washington Stocks	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Whale, Mesoplodon beaked	California/Oregon/Washington Stocks	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, Mesoplodon beaked	California/Oregon/Washington Stocks	All	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, Mesoplodon beaked	California/Oregon/Washington Stocks	All	30	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, Hubbs' beaked	Range-wide	All	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, Hubbs' beaked	Range-wide	All	30	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, Perrin's beaked	Range-wide	All	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, Perrin's beaked	Range-wide	All	30	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, pygmy beaked	Range-wide	All	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, pygmy beaked	Range-wide	All	30	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, unidentified beaked	NA	All	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, unidentified beaked	NA	All	30	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, pilot, short-finned	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, pilot, short-finned	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole or by UAV
Whale, pilot, short-finned	Range-wide	Adult/ Juvenile	30	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 10 may receive suction cup tags; Up to 20 may receive dart/barb tags; up to 10 may receive both.
Whale, pilot, short-finned	Range-wide	All	2000	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Whale, pilot, short-finned	Range-wide	All	2000	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Dolphin, Risso's	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Dolphin, Risso's	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, Risso's	Range-wide	All	2000	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, Risso's	Range-wide	All	2000	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Dolphin, common, short-beaked	California/Oregon/Washington Stock	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Dolphin, common, short-beaked	California/Oregon/Washington Stock	Adult/ Juvenile	5	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	other=audible acoustic imaging
Dolphin, common, short-beaked	California/Oregon/Washington Stock	All	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, common, short-beaked	California/Oregon/Washington Stock	All	25	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Dolphin, common, long-beaked	California Stock	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Dolphin, common, long-beaked	California Stock	All	5	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	other=audible acoustic imaging
Dolphin, common, long-beaked	California Stock	All	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, common, long-beaked	California Stock	All	25	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Dolphin, Pacific white-sided	Range-wide	Adult/ Juvenile	50	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Dolphin, Pacific white-sided	Range-wide	Adult/ Juvenile	5	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole only
Dolphin, Pacific white-sided	Range-wide	Adult/ Juvenile	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Up to 5 may receive suction cup tags; Up to 20 may receive dart/barb tags; up to 5 may receive both.

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Dolphin, Pacific white-sided	Range-wide	All	25	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=audible acoustic imaging
Dolphin, Pacific white-sided	Range-wide	All	25	1	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	Incidental to acoustic active playback/broadcast
Dolphin, Pacific white-sided	Range-wide	All	2500	10	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Dolphin, Pacific white-sided	Range-wide	All	2500	10	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Dolphin, striped	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Dolphin, striped	Range-wide	All	2000	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, striped	Range-wide	All	2000	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Dolphin, northern right whale	Range-wide	Adult/ Juvenile	50	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Dolphin, northern right whale	Range-wide	Adult/ Juvenile	5	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole only
Dolphin, northern right whale	Range-wide	Adult/ Juvenile	5	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, northern right whale	Range-wide	All	2000	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Dolphin, northern right whale	Range-wide	All	2000	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Porpoise, harbor	Range-wide	Adult/ Juvenile	50	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Porpoise, harbor	Range-wide	Adult/ Juvenile	100	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	other=audible acoustic imaging
Porpoise, harbor	Range-wide	Adult/ Juvenile	25	3	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast
Porpoise, harbor	Range-wide	All	5000	50	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Porpoise, harbor	Range-wide	All	5000	50	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Porpoise, Dall's	Range-wide	Adult/ Juvenile	50	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Sample, skin and blubber biopsy; Tracking	
Porpoise, Dall's	Range-wide	Adult/ Juvenile	25	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole only
Porpoise, Dall's	Range-wide	All	12	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, suction-cup (e.g., VHF, TDR); Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Porpoise, Dall's	Range-wide	Adult/ Juvenile	5	3	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast
Porpoise, Dall's	Range-wide	Adult/ Juvenile	10	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Tracking	other=audible acoustic imaging
Porpoise, Dall's	Range-wide	All	5000	50	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Porpoise, Dall's	Range-wide	All	5000	50	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, Blainville's beaked	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, Blainville's beaked	Range-wide	All	200	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole only
Whale, Longman's beaked	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, Longman's beaked	Range-wide	All	200	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole only
Whale, pygmy killer	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, pygmy killer	Range-wide	All	200	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole only
Whale, melon-headed	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, melon-headed	Range-wide	All	5000	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole only
Whale, false killer	Hawaiian Stock	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Whale, false killer	Hawaiian Stock	All	200	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole only
Whale, false killer	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Whale, false killer	Range-wide	All	5	1	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	Incidental to acoustic active playback/broadcast
Whale, false killer	Range-wide	All	2000	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	other=non-audible acoustic imaging, Sample collected using pole only
Dolphin, bottlenose	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, bottlenose	Range-wide	Adult/ Juvenile	5	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	other=non-audible acoustic imaging

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Dolphin, bottlenose	Range-wide	All	2000	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, exhaled air; Sample, fecal ; Tracking	Sample collected using pole only
Dolphin, bottlenose	Range-wide	All	2000	3	Survey, aerial	Count/survey; Imaging, thermal; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Tracking	
Dolphin, rough-toothed	Range-wide	Adult/ Juvenile	20	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Instrument, dart/barb tag; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, rough-toothed	Range-wide	All	2000	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Dolphin, spinner	Range-wide	All	2000	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, pantropical spotted	Range-wide	All	2000	10	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Dolphin, Fraser's	Range-wide	All	2000	10	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Imaging, thermal; Import/export/receive, parts; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry; Photograph/Video; Sample, fecal ; Tracking	
Seal, northern elephant	Range-wide	All	5	3	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Incidental disturbance; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	Incidental to acoustic active playback/broadcast

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Seal, northern elephant	Range-wide	All	500	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry	other=non-audible acoustic imaging,
Seal, northern elephant	Range-wide	All	500	3	Survey, aerial	Count/survey; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	
Sea lion, Steller	East of 144° Long (Eastern US) (NMFS Threatened)	All	5	1	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Incidental disturbance; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	Incidental to acoustic active playback/broadcast
Sea lion, Steller	East of 144° Long (Eastern US) (NMFS Threatened)	All	500	5	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry	other=non-audible acoustic imaging,
Sea lion, Steller	East of 144° Long (Eastern US) (NMFS Threatened)	All	500	5	Survey, aerial	Count/survey; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	
Sea lion, California	US Stock	All	5	1	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Incidental disturbance; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	Incidental to acoustic active playback/broadcast

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Sea lion, California	US Stock	All	500	10	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry	other=non-audible acoustic imaging,
Sea lion, California	US Stock	All	500	10	Survey, aerial	Count/survey; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	
Seal, harbor	Range-wide	All	25	5	Survey, vessel	Acoustic, active playback/broadcast; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Incidental disturbance; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	Incidental to acoustic active playback/broadcast
Seal, harbor	Range-wide	All	1000	25	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry	other=non-audible acoustic imaging,
Seal, harbor	Range-wide	All	1000	25	Survey, aerial	Count/survey; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	
Seal, Northern fur	Eastern Pacific Stock	All	500	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Observation, monitoring; Observations, behavioral; Other; Photo-id; Photogrammetry	other=non-audible acoustic imaging,
Seal, Northern fur	Eastern Pacific Stock	All	500	3	Survey, aerial	Count/survey; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	Platform	PROCEDURES	DETAILS
Seal, Guadalupe fur	Range-wide	All	100	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Count/survey; Import/export/receive, parts; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	
Seal, Guadalupe fur	Range-wide	All	100	3	Survey, aerial	Count/survey; Observation, monitoring; Observations, behavioral; Photo-id; Photogrammetry	
Seal, Hawaiian monk	Hawaiian Islands (NMFS Endangered)	All	10	2	Survey, vessel	Incidental disturbance	

Attachment 1b. File No. 16111 [John Calambokidis] Authorized Annual Takes in the Pacific Ocean, In addition to US waters from California to Alaska, includes international waters off central America, Mexico, the US, and Canada.

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Dolphin, bottlenose	Range-wide	All	600	10	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	
Dolphin, bottlenose	Range-wide	Non-neonate	50	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	
Dolphin, bottlenose	Range-wide	Non-neonate	30	1	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video	10 suction cup tags, 20 other tags; maximum of 2 animals would have multiple tags attached
Dolphin, common, long-beaked	Range-wide	All	10000	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral;	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
						Photograph/Video	
Dolphin, common, short-beaked	Range-wide	All	10000	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video	
Dolphin, northern right whale	Range-wide	All	10000	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video	
Dolphin, northern right whale	Range-wide	Non-neonate	30	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video; Sample, skin and blubber biopsy	
Dolphin, Pacific white-sided	Range-wide	All	10000	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video	
Dolphin, Pacific white-sided	Range-wide	Non-neonate	30	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video; Sample, skin	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
						and blubber biopsy	
Dolphin, Pacific white-sided	Range-wide	Non-neonate	10	1	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Observations, behavioral; Photograph/Video; Sample, skin and blubber biopsy	
Dolphin, Risso's	California/Oregon/Washington Stock	All	1000	10	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	
Dolphin, Risso's	California/Oregon/Washington Stock	Non-neonate	100	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	Level B + biopsy
Dolphin, Risso's	California/Oregon/Washington Stock	Non-neonate	30	1	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument,	10 suction cup tags, 20 other tags, max 2 animals would receive multiple tags

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
						suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	
Dolphin, striped	Range-wide	All	1000	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video	
Porpoise, Dall's	Range-wide	Non-neonate	10	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video; Sample, skin and blubber biopsy	Level B + biopsy
Porpoise, Dall's	Range-wide	All	2000	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video	
Porpoise, harbor	Range-wide	Non-neonate	10	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video; Sample, skin and blubber biopsy	Level B + biopsy

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Porpoise, harbor	Range-wide	All	2000	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Count/survey; Observations, behavioral; Photograph/Video	
Sea lion, California	US Stock	All	500	5	Survey, ground	Collect, scat; Count/survey; Incidental disturbance; Observation, monitoring	
Sea lion, California	US Stock	All	500	3	Survey, vessel	Count/survey; Incidental disturbance	
Sea lion, Steller	East of 144∞ Long (Eastern US) (NMFS Threatened)	All	500	3	Survey, ground	Collect, scat; Count/survey; Incidental disturbance; Observation, monitoring	
Sea lion, Steller	East of 144∞ Long (Eastern US) (NMFS Threatened)	All	100	2	Survey, vessel	Count/survey; Incidental disturbance	
Seal, harbor	Range-wide	All	3000	5	Survey, vessel	Collect, scat; Count/survey; Incidental disturbance; Observation, monitoring	
Seal, harbor	Range-wide	All	3000	5	Survey, ground	Collect, scat; Count/survey; Incidental disturbance; Observation, monitoring	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Seal, northern elephant	California Breeding Stock	All	100	2	Survey, vessel	Count/survey; Incidental disturbance	
Seal, Northern fur	Range-wide	All	200	2	Survey, vessel	Count/survey; Incidental disturbance	
Whale, Baird's beaked	Range-wide	All	250	10	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	
Whale, Baird's beaked	Range-wide	Non-neonate	50	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	
Whale, Baird's beaked	Range-wide	Non-neonate	40	1	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	20 suction cup tags, 20 other tags; max of 4 animals would receive multiple tags

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	Non-neonate	100	2	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	Level B + biopsy sampling; calves > 4months may be sampled
Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	Non-neonate	80	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	50 suction cup tags, 30 other tags, maximum 6 animals would receive multiple tags
Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	All	2000	10	Survey, aerial/vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Underwater	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
						photo/videography	
Whale, Bryde's	Eastern Tropical Pacific Stock	All	100	10	Survey, aerial/vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Underwater photo/videography	
Whale, Bryde's	Eastern Tropical Pacific Stock	Non-neonate	20	2	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy; Underwater photo/videography	
Whale, Bryde's	Eastern Tropical Pacific Stock	Non-neonate	25	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR);	5 suction cup tags, 20 other tags; 1 animal may receive multiple tags

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
						Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy; Underwater photo/videography	
Whale, Cuvier's beaked	Range-wide	All	150	10	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	
Whale, Cuvier's beaked	Range-wide	Non-neonate	50	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	Level B + biopsy
Whale, Cuvier's beaked	Range-wide	Non-neonate	50	3	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample,	30 suction cup tags, 20 other tags; max 4 animals may have multiple tags attached

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
						skin and blubber biopsy	
Whale, dwarf sperm	California/Oregon/Washington Stock	All	50	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	
Whale, fin	Range-wide (NMFS Endangered)	Non-neonate	100	2	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	calves > 4 months may be biopsy sampled
Whale, fin	Range-wide (NMFS Endangered)	All	1500	10	Survey, aerial/vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Underwater	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
						photo/videography	
Whale, fin	Range-wide (NMFS Endangered)	Non-neonate	60	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	30 suction cup tags, 30 other tags; maximum of 6 whales would recieve multiple tags
Whale, gray	Eastern North Pacific	All	1500	20	Survey, aerial/vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Underwater photo/videography	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, gray	Eastern North Pacific	Non-neonate	50	2	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy; Underwater photo/videography	calves > 4 months may be biopsy sampled
Whale, gray	Eastern North Pacific	Non-neonate	60	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy; Underwater photo/videography	30 suction cup tags, 30 other tags; max 6 animals may have multiple tags attached
Whale, humpback	Eastern North Pacific Stock (NMFS Endangered)	Non-neonate	80	3	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and	50 suction cup tags, 30 other tags; maximum of 6 animals may receive multiple tags

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
						blubber biopsy; Underwater photo/videography	
Whale, humpback	Eastern North Pacific Stock (NMFS Endangered)	All	2000	10	Survey, aerial/vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Underwater photo/videography	
Whale, humpback	Eastern North Pacific Stock (NMFS Endangered)	Non-neonate	100	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	calves > 4 months may be biopsy sampled
Whale, killer	AT1 Transient Stock	All	200	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Alaska Resident Stock	All	200	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	
Whale, killer	Eastern North Pacific Northern Resident Stock	All	300	10	Survey, aerial/vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Underwater photo/videography	
Whale, killer	Eastern North Pacific Northern Resident Stock	Non-neonate	10	2	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	Level B + biopsy

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Northern Resident Stock	Non-neonate	5	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	
Whale, killer	Eastern North Pacific Offshore Stock	All	500	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Underwater photo/videography	
Whale, killer	Eastern North Pacific Offshore Stock	Non-neonate	20	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy; Underwater photo/videography	Level B + biopsy

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Offshore Stock	Non-neonate	10	1	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy; Underwater photo/videography	
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	All	300	10	Survey, aerial/vessel	Collect, remains for predation study; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	Level B only
Whale, killer	Gulf of Alaska, Aleutian Islands, Bering Sea Transient Stock	All	200	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	
Whale, killer	West Coast Transient Stock	All	300	10	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, killer	West Coast Transient Stock	Non-neonate	20	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	Level B + biopsy
Whale, killer	West Coast Transient Stock	Non-neonate	10	1	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	
Whale, Mesoplodon beaked	California/Oregon/Washington Stocks	All	150	10	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	
Whale, Mesoplodon beaked	California/Oregon/Washington Stocks	Non-neonate	50	2	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	Level B + biopsy

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, Mesoplodon beaked	California/Oregon/Washington Stocks	Non-neonate	40	1	Survey, vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy	20 suction cup tags, 20 other tags; max 4 animals may receive multiple tags
Whale, minke	California/Oregon/Washington stock	All	200	10	Survey, aerial/vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Underwater photo/videography	
Whale, minke	California/Oregon/Washington stock	Non-neonate	30	2	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, minke	California/Oregon/Washington stock	Non-neonate	30	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	10 suction cup tags, 20 other tags; maximum of 2 animals would receive multiple tags
Whale, pilot, short-finned	Range-wide	All	250	10	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Underwater photo/videography	
Whale, pilot, short-finned	Range-wide	Non-neonate	30	2	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, pilot, short-finned	Range-wide	Non-neonate	50	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	30 suction cup tags, 20 other tags; maximum of 4 animals would receive multiple tags
Whale, pygmy sperm	California/Oregon/Washington stock	All	50	5	Survey, aerial/vessel	Acoustic, passive recording; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video	
Whale, sei	Eastern North Pacific Stock (NMFS Endangered)	All	70	10	Survey, aerial/vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Underwater photo/videography	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, sei	Eastern North Pacific Stock (NMFS Endangered)	Non-neonate	20	2	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	
Whale, sei	Eastern North Pacific Stock (NMFS Endangered)	Non-neonate	15	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	5 suction cup tags, 10 other tags; 1 animal may have multiple tags attached
Whale, sperm	Range-wide (NMFS Endangered)	All	700	10	Survey, aerial/vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Underwater	Range wide chosen because no good boundary between EN Pacific CA-OR-WA stock

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
						photo/videography	
Whale, sperm	Range-wide (NMFS Endangered)	Non-neonate	100	2	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	
Whale, sperm	Range-wide (NMFS Endangered)	Non-neonate	60	1	Survey, vessel	Acoustic, passive recording; Acoustic, sonar for prey mapping; Collect, remains for predation study; Collect, sloughed skin; Count/survey; Instrument, dart/barb tag; Instrument, dorsal fin/ridge attachment; Instrument, suction-cup (e.g., VHF, TDR); Observations, behavioral; Photo-id; Photograph/Video; Sample, exhaled air; Sample, skin and blubber biopsy; Underwater photo/videography	40 suction cup tags, 20 other tags; maximum 4 animals would receive multiple tags

Attachment 1c. File No. 15569 [Center for Whale Research (Ken Balcomb)] Authorized Annual Takes in the Pacific Ocean - AK,CA,OR,WA including inland marine waters of Washington State and Alaska, Coastal waters out to edge of Continental Shelf and fifty miles beyond off California, Oregon, Washington and Alaska.

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	All	8500	100	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, killer	Range-wide	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	Except SRKW (see line #1)
Whale, blue	Eastern North Pacific Stock (NMFS Endangered)	All	100	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, fin	Range-wide (NMFS Endangered)	All	100	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, humpback	Range-wide (NMFS Endangered)	All	300	20	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, sperm	Range-wide (NMFS Endangered)	All	100	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, gray	Eastern North Pacific	All	5000	20	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Whale, sei	Range-wide (NMFS Endangered)	All	100	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, Bryde's	Range-wide	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, right, North Pacific	Eastern North Pacific Stock (NMFS Endangered)	All	10	2	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, minke	California/Oregon/Washington stock	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, Cuvier's beaked	California/Oregon/Washington stock	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, Baird's beaked	California/Oregon/Washington stock	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, Mesoplodon beaked	California/Oregon/Washington Stocks	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Whale, Longman's beaked	NA	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	PLATFORM	PROCEDURES	DETAILS
Porpoise, Dall's	California/Oregon/Washington Stocks	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Porpoise, harbor	Inland Washington Stock	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Dolphin, Pacific white-sided	California/Oregon/Washington Stocks	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Dolphin, Risso's	California/Oregon/Washington Stocks	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Collect, remains for predation study; Count/survey; Measure; Photogrammetry; Photo-id; Sample, fecal	
Sea lion, California	US Stock	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Count/survey; Photogrammetry; Photo-id	
Sea lion, Steller	East of 144° Long (Eastern US) (NMFS Threatened)	All	100	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Count/survey; Photogrammetry; Photo-id	
Seal, harbor	Oregon & Washington Coastal Waters Stocks	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Count/survey; Photogrammetry; Photo-id	
Seal, Northern fur	Eastern Pacific Stock	All	5000	10	Survey, aerial/vessel	Acoustic, passive recording; Observations, behavioral; Count/survey; Photogrammetry; Photo-id	

Appendix 1d. File No. 16160 [The Whale Museum] Proposed Annual Takes in Washington State. Both males and females could be harassed.

SPECIES	LISTING UNIT/STOCK	LIFESTAGE	NUMBER OF ANIMALS	TAKES PER INDIVIDUAL	OBSERVE/COLLECT METHOD	PROCEDURES
Dolphin, Pacific white-sided	California/Oregon/ Washington - Northern and Southern Stocks	All	20	1	Survey, vessel	Observations, behavioral; Photograph/Video
Porpoise, Dall's	California/Oregon/ Washington Stock	All	10	1	Survey, vessel	Observations, behavioral; Photograph/Video
Porpoise, harbor	Inland Washington Stock	All	10	1	Survey, vessel	Observations, behavioral; Photograph/Video
Whale, gray	Eastern North Pacific	All	5	1	Survey, vessel	Observations, behavioral; Photograph/Video
Whale, humpback	Eastern North Pacific Stock (NMFS Endangered)	All	10	1	Survey, vessel	Observations, behavioral; Photograph/Video
Whale, killer	Eastern North Pacific Offshore Stock	All	10	1	Survey, vessel	Count/survey; Observation, monitoring; Observations, behavioral; Photograph/Video
Whale, killer	Eastern North Pacific Southern Resident Stock (NMFS Endangered)	All	200	1	Survey, vessel	Count/survey; Observation, monitoring; Observations, behavioral; Photograph/Video
Whale, killer	Eastern North Pacific Transient Stock	All	50	1	Survey, vessel	Count/survey; Observation, monitoring; Observations, behavioral; Photograph/Video
Whale, minke	California/Oregon/ Washington stock	All	10	1	Survey, vessel	Observations, behavioral; Photograph/Video

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

JUL 12 2012

Finding of No Significant Impact
for the Environmental Assessment for Issuance of Four Scientific Research Permits for Cetacean Studies (File No. 16111)

Background

Between December 2010 and January 2011, the National Marine Fisheries Service (NMFS) received four applications for permits to conduct research on marine mammals in the Pacific Ocean and inland waters of the U.S. The applications were submitted by: Northwest Fisheries Science Center (NWFSC); File No. 16163; The Whale Museum, File No. 16160; John Calambokidis, File No. 16111; and Ken Balcomb, File No. 15569. In accordance with the National Environmental Policy Act, NMFS prepared an Environmental Assessment (EA) analyzing the impacts on the human environment associated with permit issuance (Environmental Assessment or Issuance of Four Scientific Research Permits for Cetacean Studies). A Finding of No Significant Impact (FONSI) that covered three of the permits (File Nos. 16163, 15569, 16160) was signed on June 4, 2012.

In addition, a Biological Opinion was issued under the Endangered Species Act (June 4, 2012) summarizing the results of an intra-agency consultation. The analyses in the EA, as informed by the Biological Opinion, support the findings and determination below.

Although the EA and Biological Opinion analyzed Mr. Calambokidis' proposed research, his permit was not covered by the original FONSI, due to timing. Despite efforts to keep all four permits on the same timeline for batched processing, Mr. Calambokidis' application was not yet complete when the other applications were published in the *Federal Register*. Once Mr. Calambokidis provided the additional information that the Permits Division requested, his application was published on April 2, 2012. However, by then the FONSI for the three permits had already been prepared and was being reviewed. This FONSI pertains solely to the action of issuing Permit No. 16111 to Mr. Calambokidis for marine mammal research in the Eastern North Pacific from Central America to Alaska.

Analysis

National Oceanic and Atmospheric Administration Administrative Order 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in Fishery Management Plans?

Response: Issuance of the permit is not expected to affect ocean and coastal habitats or any designated Essential Fish Habitat (EFH). Although EFH may be present in the action area, the proposed action would only affect marine mammals authorized for research by the permit. The majority of research would only involve routine vessel movements at the water surface and all activities would be directed at target marine mammal species. None of the activities in the Proposed Action are directed at or likely to have any impact on habitat. The Proposed Action does not involve alteration of substrate, movement of water or air masses, or other interactions with physical features of ocean and coastal habitat. Therefore, no EFH consultation was required.

2) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

Response: The effects of the action on target species, including ESA-listed species and their habitat, EFH, marine sanctuaries, and non-target species were all considered in the EA and the associated Biological Opinion. The Proposed Action would target marine mammals for research activities that are expected to only result in short-term minimal disturbance to individual whales. This work is not expected to interfere with benthic productivity, an animal's susceptibility to predation, alter dietary preferences or foraging behavior, or change distribution or abundance of predators or prey. Therefore, the Proposed Action is not expected to have a substantial impact on biodiversity or ecosystem function

3) Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?

Response: No, the proposed action is not expected to impact public health or safety. The Proposed Action involves issuance of a permit to take marine mammals via vessel, aerial, and ground surveys. Research activities include: population counts, photo-identification, behavioral focal follows, underwater observations and filming, hydroacoustic prey determination, passive acoustic recording, breath sampling, biopsy sampling, collection of sloughed skin and feces, and attachment of suction cup and dart tags. These activities do not involve hazardous methods, toxic agents or pathogens, or other materials that would have a substantial adverse impact on public health and safety.

4) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species?

Response: As determined in the 2012 ESA Biological Opinion, the proposed action would affect ESA-listed marine mammals in the action area. However, the biological

opinion concluded that the effects of the proposed action would be short-term in nature and confined to individual animals. The proposed action would not likely jeopardize the continued existence of any ESA-listed species and would not likely destroy or adversely modify designated critical habitat. The proposed action would also affect a limited number of non-ESA listed marine mammals. The effects are expected to be short-term and recoverable, and to not result in impacts on populations, stocks or species.

5) Are significant social or economic impacts interrelated with natural or physical environmental effects?

Response: Effects of the Proposed Action would be limited to the short-term harassment of target animals. Permitting take exemptions for the proposed research could result in a low level of economic benefit to local economies in the action area. However, such impacts would be negligible on a national or regional level and therefore are not considered significant. These impacts are not interrelated with any natural or physical impacts. The Proposed Action would not result in inequitable distributions of environmental burdens or affect access (short-or long-term use) to any natural or depletable resources in the action area.

6) Are the effects on the quality of the human environment likely to be highly controversial?

Response: NMFS does not consider the Proposed Action controversial nor has it been considered controversial in the past. The proposed research activities are standard research activities that have been conducted on these species by the scientific community, and by the applicant, for decades. The Permits Division published a notice in the Federal Register that initiated a 30-day public comment period; however, no comments on the application were received. In addition, past submitted monitoring reports that include information on the effects of research are in agreement with published scientific literature on the effects of the types of proposed research activities. No other portion of the marine environment beyond the target species would be impacted by the proposed action.

7) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas?

Response: Issuance of the permit is not expected to result in substantial impacts to any such area. Essential fish habitat and critical habitat would not be impacted by the taking of marine mammals by harassment.

8) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: The effects of permit issuance on the environment are not uncertain and the takes of marine mammals do not involve unique or unknown risks. The potential for harassment and mortality to the target and non-target marine mammals is known

and has been considered. The proposed procedures have been used on multiple cetacean and pinniped species. Short and long-term physical and behavioral reactions including tag site healing have been thoroughly documented and were discussed in the EA. Risks to other portions of the human environment as a result of the takes are not expected.

9) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

Response: The proposed action is not related to other actions with individually insignificant, but cumulatively significant impacts. The incremental impact of the action when added to other past, present, and reasonably foreseeable future actions discussed above and in the EA would be minimal and not significant.

10) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

Response: The proposed action would not take place in any district, site, highway, structure, or object listed in or eligible for listing in the National Register of Historic Places, thus none would be impacted. As analyzed in the EA, the proposed action would not cause the loss or destruction of significant scientific, cultural or historical resources. None of these resources are expected to be directly or indirectly impacted.

11) Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?

Response: The Proposed Action would not be removing or introducing any species; therefore, it would not likely result in the introduction or spread of a non-indigenous species. Researchers would not be exchanging ballast water during the course of research.

12) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

Response: The decision to issue the permit would not be precedent-setting and would not affect any future decisions. Issuance of a permit to a specific individual or organization for a given research activity does not in any way guarantee or imply that NMFS will authorize other individuals or organizations to conduct the same research activity. Any future request received would be evaluated upon its own merits relative to the criteria established in the MMPA, ESA, and NMFS' implementing regulations.

13) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

Response: Issuance of this permit is not expected to violate any Federal, State, or local laws or requirements related to environmental protection. NMFS has sole

jurisdiction for issuance of such permit for marine mammals and has determined the proposed research to be consistent with all applicable provisions of the MMPA and ESA. The permit currently contains language stating that the permit do not relieve the Permit Holder of the responsibility to obtain any other permits, or the need to comply with any other Federal, State, local, or international laws or regulations.

14) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Response: As discussed in the EA, the marine mammals that would be affected by the proposed action are already exposed to a variety of human activities, including subsistence hunting, entanglement in fishing gear, anthropogenic noise, vessel traffic, military and industrial activities, and scientific research. However, the incremental effect of the proposed action would be insignificant. The proposed takes of marine mammals by harassment during the life of the permit are not likely to contribute to collectively significant adverse impacts on marine mammal stocks or species, including those listed as threatened or endangered. The effects of the takes would be transitory and recoverable, associated with only minor and short-term changes in the behavior of a limited number of individual marine mammals. The frequency and duration of the disturbance under the proposed permit would allow adequate time for animals to recover from any potential adverse effects, such that additive or cumulative effects of the action on its own are not expected. Therefore, the proposed action is not expected to result in cumulative adverse effects on target or non-target species.

DETERMINATION

In view of the information presented in this document, and the analyses contained in the EA and Biological Opinion prepared for issuance of Permit No. 16111, it is hereby determined that permit issuance will not significantly impact the quality of the human environment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.

JUL 12 2012

Helen M. Golde
Acting Director, Office of Protected Resources

Date