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

Supplemental Environmental Assessment on Issuance of Permit No. 13430-02 for Research on Marine Mammals

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Lead Agency:	National Oceanic and Atmospheric Administration National Marine Fisheries Service, Office of Protected Resources
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Location:	Coastal and Inland Washington and Oregon

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue a major amendment to Permit No. 13430-01 for research on marine mammals in the wild, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq.*). Permit No. 13430-01 authorizes the NMFS National Marine Mammal Laboratory (NMML) to conduct research on Pacific harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), and northern elephant seals (*Mirounga angustirostris*) within coastal waters and on pinniped rookeries and haul outs of Washington and Oregon. The permit amendment would extend the duration of the permit by five years, authorize the use of additional sedative drugs during captures, and includes additional mitigation to avoid take of an endangered species.

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CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF ACTION

1.1.1 Proposed Action

In response to receipt of an application from the National Marine Mammal Laboratory, Seattle, WA, (NMML; Responsible Party: John Bengtson, Ph.D., Director), NMFS proposes to issue a major amendment to Permit No. 13430-01 for research on marine mammals in the wild, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq*.), and the regulations governing the taking and importing of marine mammals (50 CFR Part 216). The permit would exempt the holder from the MMPA's prohibition against "takes"[1] of marine mammals during conduct of authorized research.

Permit No. 13430, issued on February 17, 2010, authorized NMML to conduct research on Pacific harbor seals, California sea lions, and northern elephant seals within coastal waters and on pinniped rookeries and haul outs of Washington and Oregon. Research activities include aerial, vessel, and ground surveys; capture for collection of tissue samples, attachment of scientific instruments and application of marks (flipper tags, brands, etc.); underwater playback experiments involving natural killer whale calls; and, import and export of samples. Incidental harassment of Steller sea lions (*Eumtopias jubatus*) of the Eastern Distinct Population Segment (DPS) and Southern Resident killer whales (*Orcinus orca*) was authorized. The NMFS Permits and Conservation Division prepared an environmental assessment (EA; NMFS 2010) for issuance of Permit No. 13430.

The permit was amended on one occasion:

- Permit No. 13430-01 was issued on March 16, 2010 and replaced Permit No. 13430-00. This minor amendment removed a permit condition[2] restricting researchers from waters designated as adjudicated usual and accustomed fishing grounds of the Makah Tribe. In lieu of this condition, Researchers were notified in the cover letter of the permit regarding U.S. Coast Guard regulations that establish a regulated navigation area around Makah Tribe vessels during authorized hunts. In addition, a mitigation measure was added to the permit to avoid takes of non-target species during playback experiments, consistent with one of the alternatives presented in Chapter 2 of the original EA but not included in the EA's preferred alternative (NMFS 2010). No additional NEPA analysis was conducted for issuance of Permit No. 13430-01.

Permit No. 13430-01 is valid through January 31, 2015. The permit holder requests a major amendment (No. 13430-02) to extend the expiration date to January 31, 2020. The permit holder proposes to add use of an alternate injectable sedative to reduce stress in harbor seals and California sea lions that may be caused by procedures that have prolonged handling times, such as instrument attachment. The protocols currently include administering diazepam (i.e.,

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1 Under the MMPA, "take" is defined as to "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect." [16 U.S.C. 1362(18)(A)]

2 Condition III.B.5.p. To avoid interference with gray whale subsistence activities of the Makah Indian Tribe in waters along the northwest Washington coast, including the entrance of the Strait of Juan de Fuca, Researchers must avoid conducting research in that area between April 1 and October 31.

Valium); the change would be to use midazolam (and its reversal agent, flumazenil) in lieu of diazepam at the discretion of the attending veterinarian. The permit holder also proposes additional mitigation measures to avoid take of endangered Southern Resident killer whales.

1.1.2 Purpose and Need

As described in the original EA for Permit No. 13430 (NMFS 2010), the primary purpose of the permit is to provide an exception to the moratorium and prohibitions under the MMPA to allow takes of marine mammals for bona fide scientific research. The purpose of NMML conducting the proposed research is detailed in the 2010 EA. The purpose of extending the permit is to allow long-term data collection for assessing and managing marine mammal stocks as described above. The purpose of adding a new sedative, midazolam, is to provide an alternative to currently the permitted sedative, diazepam. Midazolam has properties that may make it advantageous during capture activities to relieve stress, such as being faster-acting and having a reversal agent.

This supplemental EA (SEA) evaluates the potential effects of amending the permit to extend the duration of the permit five years, adding the new drug for sedating pinnipeds during captures, and adding mitigation to avoid takes of Southern Resident killer whales.

1.2 NEPA DOCUMENTS THAT INFLUENCE THE SCOPE OF THIS SEA

An EA was prepared for the original permit to allow a thorough evaluation of cumulative impacts to the target species (NMFS 2010). Information from that EA is incorporated by reference in this SEA.

Other permits for the target species are summarized in Chapter 4. These permits have separate NEPA analyses associated with them. The proposed permit amendment for this SEA does not represent a substantial change in the scope or size of the overall amount of research permitted for the three subject species, because it extends the duration of one of the permits that is currently active. An updated cumulative impact analysis is included in this SEA.

1.3 SCOPING SUMMARY

Scoping identifies issues to be addressed related to the proposed action and identify and eliminate from detailed study issues that are not significant or that have been covered by prior environmental review. An additional purpose of scoping is to identify concerns of the affected public and Federal agencies, states, and Indian tribes. Comments were received from the Marine Mammal Commission and the Sea Shepherd Conservation Society during a 30 day public comment period (79 FR 35524) for the permit application. Comments are summarized below.

- The Marine Mammal Commission recommended that NMFS issue the permit amendment, provided the current permit conditions remain in effect. The Commission believes that the activities for which it has recommended approval are consistent with the purposes and policies of the MMPA. The current pinniped permit conditions would remain in effect; minor updates to the general terms and conditions consistent with all MMPA permits would be made.
- The Sea Shepherd Conservation Society requested additional justification and information on the continuation of activities and use of the proposed sedative. The

applicant provided additional information and justification to NMFS' satisfaction in a response included in the administrative record for this permit.

- The Sea Shepherd Conservation Society also commented on branding sea lions in Astoria, Oregon, stating that NMML personnel showed reckless disregard for the welfare of the animals and that the number of animals branded depended on whether Sea Shepherd personnel were watching. Sea Shepherd questioned the merits of the sample sizes and validity of the scientific findings. However, those activities are not conducted under the proposed permit and are authorized separately under section 109(h) of the MMPA. Any questions as to whether those activities are conducted in compliance with the MMPA are outside the scope of this permit application. Any branding conducted under the proposed research permit requires researchers to follow mitigation measures to minimize impacts to the animals; any non-compliance during authorized research would constitute grounds for permit suspension, modification, or revocation. Comments were not received from Sea Shepherd regarding the conduct of branding activities authorized by NMML's permit.

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action Alternative, the permit amendment would not be issued for the activities proposed by the applicant and the permit would expire on January 31, 2015. Research on the three target species of pinnipeds would continue under other permits issued by NMFS pursuant to the MMPA, as described in Chapter 4. NMML shares mark-resight data with other pinniped researchers throughout the eastern Pacific regions. However, research activities specifically related to the marine mammal stock assessment work conducted by NMML (the applicant) as mandated for NMFS management needs would not be permitted.

2.2 ALTERNATIVE 2 – PROPOSED PERMIT WITH MITIGATION

Under this alternative, the permit amendment would authorize continuation of direct takes of California sea lions, harbor seals, and northern elephant seals, and incidental harassment of Steller sea lions, as is currently permitted, for an additional five years. The specific research methods and take numbers are described in the original application (NMFS permit application File No. 13430) and the amendment request. The take numbers would not change.

In summary, the permit would continue to authorize harassment from surveys (aerial, vessel, and ground) of California sea lions, harbor seals, and northern elephant seals on rookeries and haul outs in Oregon and Washington; and takes by capture of individual animals in water and on land for collection of various tissue samples, attachment of scientific instruments for collection of data on habitat use and foraging, and application of marks (flipper tags, brands, etc.) to allow identification of individual animals for subsequent re-captures or surveys in Oregon and Washington.

The permit would also continue to authorize harassment of California sea lions during playback experiments involving broadcasts of recorded killer whale vocalizations from an underwater speaker deployed at a depth of approximately 5 m, from a small boat anchored 100 m from a sea lion haulout site. The frequency range of the signal would be 10 – 22 kHz, centered at 16 kHz,

with a maximum source level at 148 dB (reference pressure 1 μPa at 1m). Locations of playback experiments may include Shilshole Bay, Everett, Ballard Locks, Neah Bay and East Bodelteh Island in Washington, and at Bonneville Dam, Astoria, Rogue River, and the lower Columbia River near Astoria in Oregon. No playback experiments have been conducted to date under the current permit (NMML Permit No. 13430 annual reports 2011-2014).

The permit would continue to authorize harassment of Steller sea lions of the Eastern DPS incidental to these research activities. In addition to the surveys, captures, and harassment, the permit would continue to authorize mortality of a limited number of animals from the three target species incidental to any of the permitted activities. The permit would authorize up to 5 harbor seal, 5 California sea lion, and up to 2 elephant seal mortalities per year. To date, no mortalities have occurred under the permit (NMML Permit No. 13430 annual reports 2011-2014).

The permit holder requests to add the option of using the sedative, midazolam, in lieu of diazepam (Valium), during captures of pinnipeds. Midazolam would be used at the dosage of 0.1 mg/kg of weight for otariids and phocids to reduce anxiety in harbor seals or California sea lions that are unduly stressed by any procedure that may have a prolonged handling time. These procedures include application of back or head mounted instruments, insertion of stomach temperature instruments, or restraint of large adult males or non-pregnant adult females. Midazolam may also be used prior to administering gas anesthesia at the discretion of a veterinarian.

Under the Proposed Permit alternative, the permit amendment would be issued for activities as proposed by the applicant, with the permit terms and conditions standard to such permits as issued by NMFS. These include conditions required by the MMPA and NMFS regulations for research permits, and special conditions common to permits for research on pinnipeds. The special conditions related to research on pinnipeds are intended to mitigate (avoid or minimize) potential adverse effects on animals due to the specific research methods.

The following condition was added to Permit No. 13430-01 when amended: "*For playbacks, Researchers must visually survey a 1-mile radius from the playback source 30 minutes prior to initiation of playbacks, turn off the playback source if marine mammals not listed in this permit are sighted within 100 m of the source, and keep it turned off for 30 minutes after any of these animals are sighted within 100 m of the source. Researchers must not conduct playbacks if sea state or other conditions limit visibility within 1-mile of the source.*" This condition would remain in the proposed permit amendment. In the original application, the applicant proposed to conduct passive acoustic monitoring. For this amendment, the applicant has also agreed to contact Southern Resident killer whale researchers (e.g., The Whale Museum, The Center for Whale Research, or NMFS Northwest Fisheries Science Center) prior to conducting experiments to identify locations of whales in order to avoid takes of Southern Resident killer whales.

CHAPTER 3 AFFECTED ENVIRONMENT

The applicant has proposed to conduct research within coastal waters and on pinniped rookeries and haul outs of Washington and Oregon. The EA for the original permit (NMFS 2010) is incorporated by reference with relevant sections summarized below.

3.1 SOCIAL AND ECONOMIC ENVIRONMENT

Gray whales (*Eschrichtius robustus*) are known to occur within the action area and are considered a cultural resource for the Makah Indian Tribe in Washington. Members of this tribe are allowed to hunt gray whales, for subsistence purposes, between April 1 and October 31 of each calendar year in those open waters of the Pacific Ocean, which are outside the Tatoosh-Bonilla Line, and within the adjudicated usual and accustomed grounds of the Makah Tribe. These waters are along the northwest Washington coast and include the entrance of the Strait of Juan de Fuca. Coast Guard regulations (33 CFR 165.1310) establish a regulated navigation area around Makah Tribe vessels during authorized hunts. If a hunt is underway, researchers must stay 500 yards away from the hunters. Thus, researcher activities would not affect the gray whale hunt.

3.2 PHYSICAL ENVIRONMENT

There are a number of places within the action area that could be considered unique or ecologically critical, including coastal wetlands, the Olympic Coast National Marine Sanctuary, the San Juan Islands National Monument, several National Wildlife Refuges, State Parks, essential fish habitat designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and ESA designated critical habitat. The proposed research activities are not expected to affect the physical features of the action area as the activities are directed on the target species and little to no impacts will occur from researchers' presence. The Permits and Conservation Division provided a copy of the amendment application to the Olympic Coast National Marine Sanctuary, who had no objection to issuance of the requested permit amendment. In some cases, researchers are required to obtain special use permits for accessing protected areas, which would require additional mitigation measures to minimize impacts to such areas. The permit is conditioned such that issuance of the permit does not relieve the permit holder of the responsibility to obtain any other permits, or comply with any other Federal, State, local, or international laws or regulations.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 Target Marine Mammal Species

Three species of pinnipeds are the focus of the proposed research: California sea lions, Pacific harbor seals, and northern elephant seals. None of these stocks are listed as threatened or endangered under the Endangered Species Act (ESA). The statuses of the target species have not been updated since issuance of the original permit and are as follows (Caretta et al. 2014).

California sea lions: The estimated abundance of the U.S. stock of California sea lions in the U.S. is 296,750 animals based on data from 2008. The population is increasing and the potential biological removal[3] (PBR) for this stock is 9,200 animals annually.

3 Potential biological removal level is defined in the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population

Northern elephant seals: The estimated abundance of the U.S. California breeding stock of northern elephant seals is 124,000 animals (in 2005), the population is increasing, and the PBR is 4,382 seals annually.

Pacific harbor seals: The Oregon-Washington stock of harbor seals was estimated to be 24,732 animals in 1999; however, there is no current estimate of abundance available for this stock and PBR cannot be calculated. The Washington Inland Waters stocks were estimated to be 13,692 animals in 1999; and, like the Oregon-Washington stock, there is no current population estimate or PBR level. A primary purpose of the research is to conduct monitoring to update these population estimates.

3.3.2 Non-target Species

Pacific salmon, anadromous trout, leatherback sea turtles (*Dermochelys coriacea*), northern sea otters (*Enhydra lutris kenyoni*), Steller sea lions, a variety of cetacean species, and sea birds that may be present in the action area at various times of year and could be exposed to the research activities. Fish are not likely to be affected because the mesh size of the nets used for beach seine captures is sufficiently large to exclude fish that may be present in the nearshore waters; and, the proposed playbacks are not likely to elicit response from any fish species. Leatherback sea turtles do not nest in the North Pacific and are not likely to be harassed by aerial or boat surveys. Sea turtle auditory sensitivity is poor, and it is unlikely the sound transmissions in the proposed research would elicit responses from leatherback sea turtles. Northern sea otters are avoided and are generally not present in areas when seine netting occurs or where playbacks would be done; researchers would be required to follow U.S. Fish and Wildlife Service mitigation measures to avoid sea otters. Non-target cetaceans would be avoided and are not likely to be affected by the research activities, which are conducted on or near shorelines. Nesting sea birds are not likely to be affected by the researchers' actions directed on pinnipeds. Researchers would have to adhere to any special mitigation measures required by the U.S. Fish and Wildlife Service or other agencies when working in protected areas where nesting sea birds may be present.

Steller sea lions and Southern Resident killer whales were previously identified as those species which would likely be incidentally harassed by the proposed research and for which takes were authorized. Updated information on these species' statues is presented below (Caretta et al. 2014).

Eastern Steller sea lions: The Eastern DPS of Steller sea lions (or Eastern U.S. stock) was de-listed under the ESA effective on December 4, 2013 (78 FR 66140). Eastern Steller sea lions breed on rookeries located in southeast Alaska, British Columbia, Oregon, and California; there are no rookeries located in Washington. The population is estimated to be within the range of 63,160 and 78,198 animals. Overall, counts of non-pups at trend sites in California and Oregon have been relatively stable or increasing slowly since the 1980s. The PBR for this stock is 1,552 sea lions per year.

Southern Resident killer whales: The Eastern North Pacific Southern Resident stock is a trans-boundary stock in inland Washington and southern British Columbia waters designated as endangered under the ESA and depleted under the MMPA. The population numbered 85 whales

in 2012. The PBR is 0.14 whales per year (equivalent to one animal approximately every 7 years).

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

4.1 EFFECTS OF ALTERNATIVE 1: No Action

Not issuing the permit, i.e., permit denial, would obviate the potential adverse direct and indirect effects of the proposed research on the target and non-target species and any potentially adverse direct effects on the physical environment. Permit denial would also eliminate any indirect beneficial effects on conservation of the target species that might derive from the results of the research. This alternative only involves denial of the single permit in question. There are several other research permits in effect for the target species that will presumably yield information relevant to the need for conservation of the target species, but these may not meet the objectives of NMML's (the applicant) marine mammal stock assessment activities. The populations would likely continue along the same growth trends as currently observed, however, there would be a gap in the population census data sets for these stocks in the action area if the proposed surveys are not conducted.

4.2 EFFECTS OF ALTERNATIVE 2: Proposed Permit

4.2.1 Effects on Target Species

Only those marine mammals targeted by the permit, which includes a specified number of individuals for capture, sampling, etc., and a specified number of individuals incidentally disturbed by the capture, sampling, etc., would be affected by the research. As required by the MMPA, the permit would specify the number of marine mammals that could be affected by the various research activities. The number of marine mammals specified in the proposed permit represents a small percentage of the overall population for the species and is the same annual number analyzed in the 2010 EA. The target species are not listed as depleted under the MMPA, or as threatened or endangered under the ESA.

The permit amendment would authorize the same research to continue for an additional five years at the same annual take levels. As discussed in the 2010 EA, direct adverse effects of the permitted research on marine mammals that are the target of the research permit would include effects related to disruption of feeding, breeding, pupping, resting, sheltering, and other behaviors, as well as injuries and a small number of mortalities (the number of mortalities per species that would be allowed would be approximately 3-5 per year). California sea lions exposed to the killer whale vocalization playbacks may be temporarily displaced from a foraging area if they respond to the sounds with avoidance. The sound transmissions are not expected to result in injury because the source level is below the threshold determined capable of causing injury.

The permit would not authorize intentional lethal take of any animals, but some research-related mortality is possible. Some animals could die as a result of the capture and sampling activities. Some deaths may occur at the time of capture and handling, usually from adverse reactions to sedatives or other drugs, or from injuries sustained while attempting to evade capture. The permit amendment would specify a limit on the number of research related mortalities and require

researchers to cease activities if this limit is reached. The number of allowable mortalities would not be more than a few animals per species per year, which is not expected to adversely affect the population or the species. No mortalities have occurred to date.
The permit holder requests to add the option of using the sedative, midazolam, in lieu of the currently permitted diazepam (Valium), during captures of pinnipeds. The permit holder also requests to use a reversal drug, flumazenil. Midazolam would be used to reduce anxiety in harbor seals or California sea lions that are unduly stressed by any procedure that may have a prolonged handling time. These procedures include application of back or head mounted instruments, insertion of stomach temperature instruments, or restraint of large adult males or non-pregnant adult females. Midazolam may also be used prior to administering gas anesthesia at the discretion of a veterinarian.

Midazolam and diazepam are in the same class of drugs (benzodiazepines) that are used as sedatives (anxiolytic, muscle relaxant, hypnotic). Midazolam is more lipid soluble, may more rapidly cross the blood/brain barrier to bring stress relief more quickly than diazepam, and it has a reversal agent, which Valium does not. Midazolam has been used in other pinnipeds and in some cases in combination with gas anesthesia and flumazenil without adverse effects, including Weddell seals (Bodley et al. 2013), crabeater seals (Gales et al. 2005), and Hawaiian monk seals (NMFS File No. 16632). Midazolam used in combination with other injectable sedatives (e.g., pethidine) has resulted in adverse reactions and death (Tahmindjis et al., 2003). However, for the proposed amendment, Midazolam will not be used in combination with other injectable sedatives.

The permit amendment would authorize the same number of mortalities annually as authorized in the original permit, which, if they were to occur, represent an extremely small percentage of the population of each of these species.. As noted above, no mortalities have occurred over the past 5 years. NMML has been conducting research on pinnipeds for over 30 years. The original permit application (File No. 13430) indicated their mortality rate during captures was ~0.008 (24/2979) for harbor seals, ~ 0.0037 (11/2958) for California sea lions, and 0.0 (0/20) for northern elephant seals. Past causes of mortality includes: over-restraining, hyperthermia, respiratory complications during anesthesia, drowning through entanglement in the capture net, pre-existing disease-related complications, and capture myopathy. Mitigation measures (e.g., altered squeeze cage, increased monitoring, wetting down of animals during holding period) that have been developed based on reviews of past mortality events make it unlikely that animals in the future would die due to similar causes, but disease-related complications and capture myopathy are always potential mechanisms of mortality and are thus accounted for in calculating potential incidental mortality numbers.

As noted above, none of these populations are listed as threatened or depleted. The U.S. stock of California sea lion and California breeding stock of northern elephant seal populations are robust and increasing and the limited number of mortalities, if they occurred, would not have a significant effect on these populations. While no current abundance estimates are available, the Oregon/Washington Coast and Inland Washington stocks of harbor seals were increasing through the 1990's, and these stocks are not classified as strategic[4] stocks (Caretta et al. 2014).

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4 The term "strategic stock" means a marine mammal stock—
(A) for which the level of direct human-caused mortality exceeds the potential biological removal level;

The extremely small number of incidental mortalities provided for, combined with the relative likelihood that any or all of these would even occur, supports the conclusion that the proposed research would not have a significant effect on this population.

The permit would require researchers to follow mitigation measures, as outlined in the 2010 EA, which are intended to reduce or avoid the potential for adverse impacts. For example, a permit condition requiring researchers to cease efforts to capture or sample an animal that shows signs of life-threatening stress responses from capture, restraint, or sedation minimizes the likelihood that animals will die as a result of research. There are standard permit conditions specific to mitigating potential for infection, injury, and mortality. There are conditions requiring monitoring of the effects of research and effectiveness of mitigation measures. There are also conditions requiring researchers to report annually on the effects of their research. NMFS would use those monitoring reports to evaluate the assumptions and predictions about effects of research in this EA. Finally, there are permit conditions allowing NMFS to modify, suspend, or revoke a permit if information in monitoring reports or elsewhere indicates the research is having significant adverse impacts on marine mammal species or stocks.

4.2.2 Effects on Non-target Species

Steller sea lions would be incidentally harassed during the proposed research, as discussed in the EA for issuance of the original permit (NMFS 2010). These disturbances may result in short-term disruption of behaviors and behavioral patterns at the time of the research activity, and the effects could last for hours or days following the activity. The duration and severity of the effect would depend on the behavior disrupted, the time taken to return to pre-disturbance activity (or whether the activity was abandoned), and the condition of the animals affected. For example, a disturbance may cause a group of animals to cease feeding for several hours, but the effect is short term because the disturbance was an isolated event and the animals are able to compensate by returning to feeding later that day.

The following condition is in the current permit: "*For playbacks, Researchers must visually survey a 1-mile radius from the playback source 30 minutes prior to initiation of playbacks, turn off the playback source if marine mammals not listed in this permit are sighted within 100 m of the source, and keep it turned off for 30 minutes after any of these animals are sighted within 100 m of the source. Researchers must not conduct playbacks if sea state or other conditions limit visibility within 1-mile of the source.*" This condition would remain in the proposed permit amendment. The proposed sound levels include a frequency of 10 – 22 kHz, centered at 16 kHz, with a maximum source level at 148 dB (reference pressure 1 μPa at 1m). This source level would not produce received sound levels that could cause injury (by permanent threshold shift of hearing) to marine mammals (NMFS Acoustic Interim Guidance: http://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/threshold_guidance.html). Likewise, playbacks are not expected to cause behavioral disturbance because sound levels from the source are expected to attenuate to below 120 dB re 1 μPa at 1m well within the

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(B) which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; or
(C) which is listed as a threatened or endangered species under the ESA or is designated as depleted under the MMPA.

100-m mitigation shut-down zone, and because cetaceans are not expected to be present close to shore where experiments take place.

In addition, for the original application, NMML proposed to conduct passive acoustic monitoring prior to playback experiments. For this amendment, the permit holder agreed to also contact researchers studying Southern Resident killer whales prior to conducting experiments. For example, the NMFS Northwest Fisheries Science Center has tagged individual Southern Resident killer whales from the J pod and would know the location of this pod. There is also an extensive sighting network and acoustic detection system throughout Puget Sound and its surrounding waters which can be leveraged to determine the location of individual groups of whales when in the area. NMML would not conduct experiments if researchers indicate the whales are in the vicinity of the proposed research. Locations of playback experiments may include Shilshole Bay, Everett, Ballard Locks, Neah Bay and East Bodelteh Island in Washington, and at Bonneville Dam, Astoria, Rogue River, and the lower Columbia River near Astoria in Oregon. These locations are inland harbors or small, enclosed embayments which are very rarely – if ever – used by Southern Residents, which prefer the deeper waters further offshore (e.g., Juan de Fuca Strait, Haro Strait). Indeed, if whales are traveling this close to shore, they will easily be spotted through visual observations and will have likely already been reported to the sighting network which the applicant has agreed to consult prior to initiating playback activities. These avoidance measures would ensure no takes of Southern resident killer whales would occur, and none would be permitted.

4.5 MITIGATION MEASURES

The permit holder employs a number of mitigation measures during research to minimize impacts from their activities as described in the original permit application (File No. 13430). This includes such things as minimizing the possibility of animals alerting to researchers' presence so that accurate counts and behavioral observations can be conducted. For example, between 1984 and 2007, harassment occurred on only 20% of all aerial surveys and caused less than 5% of the pinnipeds on shore to go into the water (File No. 13430 permit application). Noise reduction techniques are used during aerial surveys (e.g., slow flight, low power settings). Vessel disturbance is kept to a minimum by slow approach and reducing engine noise or turning the engine off. Disturbance from ground counts is minimized by stealth (maintaining a low profile and observing quietly from downwind).

During all captures and handling, pinnipeds are handled as quickly as is safe for the animals and biologists. Efforts are made to reduce stress by not walking in front of animals during restraint, handling them humanely, monitoring animals closely and wetting down animals during restraint to prevent hyperthermia, and releasing them as quickly as possible. Released unweaned pups are observed until reunited with their mothers. NMML researchers have never observed a female and pup to remain separated as a consequence of our capture operations.

As mentioned above, NMML would contact all Southern Resident killer whale researchers and would institute a simple observer system of scanning for killer whales and conducting passive acoustic monitoring for 30 minutes prior to any playback experiments. If killer whales are present playback experiments will not be initiated.

The permit is also conditioned to require regular reports on the effectiveness of the research at achieving the applicant's stated objectives (and thus at achieving the purpose and need of the federal action) and on the effectiveness of the mitigation measures required by the permit. By statute, regulation, and permit conditions, NMFS has authority to modify the permit or suspend the research if information suggests it is having a greater than anticipated adverse impact on target species or the environment.

4.6 CUMULATIVE IMPACTS

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

Research would result in disturbance of target and non-target species, which are also exposed to disturbance from other human activities in the action area including vessel traffic, fishing, and recreation/tourism. Whether this frequency of disturbance, by itself or in combination with disturbance from other human activities, would result in cumulative adverse effects depends on how long the effects of each disturbance last, whether the animals have sufficient time between disturbance events to resume or compensate for disrupted activities, and whether the effects of repeated disturbance are additive, synergistic or accumulate in some other way.

4.6.1 Research Permits and Other MMPA Authorizations

The following scientific research permits authorize directed take by capture, harassment, and mortality of California sea lions, harbor seals, northern elephant seals, or northern fur seals in Oregon and Washington.

- Permit No. 16087 issued to NMML, for research on California sea lions, harbor seals, and northern elephant seals in California, Oregon, and Washington; the primary location of research is California (expiration date June 30, 2019).

- Permit No. 16621 issued to Alejandro Acevedo-Gutiérrez, Western Washington University, to conduct experimental trials on harbor seals involving simulations of natural (eagles) and human (kayak) stressors (expiration date March 15, 2017).

- Permit No. 16991 issued to James Harvey, Moss Landing Marine Laboratories, for research on the health and ecology of harbor seals in California, Oregon, Washington, and Alaska, with incidental harassment of California sea lions and northern elephant seals (expiration date May 30, 2017).

- Permit No. 18002 issued to Alejandro Acevedo-Gutiérrez, Western Washington University, to study harbor seal foraging specialization in Washington (expiration date August 31, 2019).

Approximately 12 other research permits and 8 incidental harassment authorizations allow surveys or incidental harassment of these species, with no capture or intrusive sampling.

Although it is not possible to describe the extent of overlap under these research permits, NMFS permits for research on marine mammals require that researchers coordinate their activities with those of other permit holders to avoid unnecessary disturbance of animals. Permitted researchers are also required to notify the appropriate NMFS Regional Office at least two weeks in advance of any planned field work so that the Regional Office can facilitate this coordination and take other steps appropriate to minimize disturbance from multiple permits.

4.6.2 Other Human Activities

Within the action area the target marine mammal species are adversely affected by human activities including commercial and recreational fishing (via entrapment and entanglement in fishing gear), tourism and recreation (via harassment from human approach and presence), and habitat degradation (via displacement from haul out sites as a result of human presence). Of these, disturbance that results in displacement of groups of animals or abandonment of behaviors such as feeding or breeding by groups of animals are more likely to have cumulative effects on the species than entanglement of a few animals in fishing gear.

4.6.3 Summary of Cumulative Effects

It is likely that issuance of the proposed permit would have some cumulative adverse effects on the target animals due to the frequency of the disturbances associated with research activities. These adverse effects would likely be additive to those resulting from disturbance under other permits, and to disturbances related to other human activities in the action area. Some animals may be acclimated to a certain level of human activity and may be able to tolerate disturbance associated with these activities with little adverse impacts on population or species vital rates.

The stocks and populations of the three species of pinniped that are the target of the proposed research are not listed as depleted under the MMPA or threatened or endangered under the ESA. As described above, it is assumed the current level of human activity is not having a significant adverse effect on the species' or stocks' abilities to maintain current abundance levels and population growth rates and that the incremental contribution of this proposed action would not result in cumulatively significant impacts when considered in concert with past, present, and reasonably foreseeable future activities.

CHAPTER 5 LIST OF PREPARERS

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