REQUEST FOR AN EXTENSION OF THE REGULATIONS AND LETTERS OF AUTHORIZATION

**FOR THE INCIDENTAL TAKING OF MARINE MAMMALS
RESULTING FROM U.S. NAVY TRAINING AND TESTING ACTIVITIES
IN THE HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING STUDY AREA
OVER A 7-YEAR PERIOD**

Submitted to:

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March 2019

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EXTENSION NOTES

On August 13, 2018, the John S. McCain National Defense Authorization Act for Fiscal Year 2019 was signed into law, effectively amending 16 United States Code section 1371 to extend the period for which the Secretary of Commerce may authorize the incidental taking of marine mammals by military readiness activities from five years to seven years if the Secretary finds that such takings will have a negligible impact on any marine mammal species and prescribes regulations for the permissible methods of take, means of effecting the least practicable adverse impact on species or stock and habitats, and requirements for monitoring and reporting such taking.

At the time of Notice of Receipt of the Letters of Authorization (LOA) Application (following the original LOA application submitted on September 11, 2017), the Marine Mammal Protection Act only allowed the incidental taking of marine mammals by citizens while engaging in lawful activities for up to five consecutive years after notice and comment and issuance of regulations and a Letter of Authorization by National Marine Fisheries Service (16 United States Code section 1371(a)(5)(A)(i)). While the Marine Mammal Protection Act historically only allowed issuance of an incidental take permit for up to five consecutive years at a time, the Navy's military readiness activities are ongoing into the reasonably foreseeable future. Previous authorization requests have presented impacts in aggregate, focused on identifying potential exposures and quantifying incidental take in a 5-year structure due to the limitation based on the Marine Mammal Protection Act. For the purposes of presentation in the original LOA application, data were organized in one-year and 5-year increments, but the analysis was conducted only on the one-year (annual) numbers. The National Marine Fisheries Service then analyzed this data under the standards of the Marine Mammal Protection Act to determine if the maximum annual takes would result in a negligible impact on the species or stock by assessing their impact on the annual rates of recruitment and other measures. They also considered how the total or cumulative take over the period of the authorization would affect the species or stock. The annual and 5-year take request that was presented in the original LOA application remains the same. The only difference in this take request is that two additional years (one with a maximum level of training and testing activities and one with a representative year of training and testing activities as described in the Hawaii-Southern California Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement Proposed Action) have been added to the requested activity, resulting in a revised total or cumulative take request across the seven years of the authorization. Annual rates of take are the same as concluded in the original LOA application.

Given the change to allow issuance of incidental take authorization for seven consecutive years, the Navy is requesting that the National Marine Fisheries Service extend the Hawaii-Southern California Training and Testing Marine Mammal Protection Act Letters of Authorization dated December 21, 2018 to allow for regulated training and testing activities to occur for the full seven years allowable by law, extending the Hawaii-Southern California Training and Testing regulations and Letters of Authorization through December 20, 2025.

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ABBREVIATIONS AND ACRONYMS

Acronym	Definition	Acronym	Definition
ASW	Anti-Submarine Warfare	Navy	United States Department of the Navy
CA	California	NMFS	National Marine Fisheries Service
dB	Decibel(s)	OEIS	Overseas Enviromental Impact Statement
EIS	Environmental Impact Statement		
FLS	Forward Looking Sonar	PMSR	Point Mugu Sea Range
FR	Federal Register	SAS	Synthetic Aperture Sonars
ft.	Foot/Feet	SD	Swimmer Detection Sonars
HF	High-Frequency	SOAR	Southern California Anti-Submarine Warfare Range
HI	Hawaii		
HRC	Hawaii Range Complex	SOCAL	Southern California Range Complex
HSTT	Hawaii-Southern California Training and Testing		
IB	Imperial Beach Minefield	SWAT	Special Weapons and Tactics
in.	Inch(es)	TAR	Training Area and Range
lb.	Pound(s)	TORP	Torpedo
LOA	Letter of Authorization	TTS	Temporary Threshold Shift
m.	Meter(s)	U.S.	United States
MF	Mid-Frequency	U.S.C.	United States Code
MMPA	Marine Mammal Protection Act		

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1 DESCRIPTION OF SPECIFIED ACTIVITY

1.1 INTRODUCTION

The United States (U.S.) Department of the Navy (Navy) has prepared this consolidated request for an extension of regulations and two Letters of Authorization (LOAs) for the incidental taking (as defined in Chapter 5, Type of Incidental Taking Authorization Requested) of marine mammals during training and testing activities within the Hawaii-Southern California Training and Testing (HSTT) Study Area. The Navy is requesting a two-year extension of the 5-year LOAs and regulations for training and testing activities currently authorized to be conducted from December 21, 2018 through December 20, 2023, and now requested to be conducted through December 20, 2025.

Under the Marine Mammal Protection Act (MMPA) of 1972, as amended (16 United States Code [U.S.C.] section 1371(a)(5)), the Secretary of Commerce shall allow, upon request, the incidental, but not intentional, taking of marine mammals by military readiness activities during periods of not more than seven years, if certain findings are made and regulations are issued after notice and opportunity for public comment. The Secretary must find that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. The regulations must set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock(s), and requirements pertaining to the monitoring and reporting of such taking.

The Navy completed an Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) for the HSTT Study Area in 2018 to evaluate all components of the proposed training and testing activities, and requested and received regulations and LOAs for those activities in the HSTT Study Area throughout the year from 2018 through 2023. This LOA request seeks an extension of regulations and LOAs for a 7-year period through 2025, the full duration now allowed by law. This LOA extension request is based on an additional two years (one with a maximum level of training and testing activities and one with a representative year of training and testing activities) of the proposed training and testing activities of the Navy's Preferred Alternative (Alternative 1 in the EIS/OEIS).

This document has been prepared in accordance with the applicable regulations of the MMPA, as amended by the National Defense Authorization Act for Fiscal Year 2004 (Public Law 108–136) and John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115-232), and its implementing regulations. The LOA extension request, like the original LOA application, is based on (1) the analysis of spatial and temporal distributions of protected marine mammals in the HSTT Study Area, (2) the review of training and testing activities analyzed in the HSTT Final EIS/OEIS that have the potential to incidentally take marine mammals, and (3) a technical risk assessment to determine the likelihood of effects. This chapter describes those training and testing activities that are likely to result in Level A harassment, Level B harassment, or mortality under the MMPA. Of the Navy activities analyzed for the HSTT Final EIS/OEIS, the Navy has determined that only the use of sonar and other transducers, air guns, pile driving and removal, and in-water detonations have the potential to affect marine mammals to a level that would constitute harassment under the MMPA.

1.2 PROPOSED ACTION

The original LOA application requested authorization for Navy training and testing activities within the HSTT Study Area. The Navy has been conducting military readiness activities in the HSTT Study Area (see Figure 2-1) for well over a century and with active sonar for over 80 years. This LOA extension request

reflects the same compilation of training and testing activities presented in the original LOA application, which are deemed necessary to accomplish military readiness requirements and are anticipated to continue into the reasonably foreseeable future. All annual and 5-year activity numbers as reported in the original LOA application, the regulations published in the Federal Register (FR) on December 27, 2018 (83 FR 66846), and the permit issued on December 21, 2018, will not change and are not reported in this document.

1.2.1 TRAINING ACTIVITIES

In the original LOA application, it was described that the Navy's Proposed Action reflected a representative year of training to account for the natural fluctuation of training cycles and deployment schedules that generally preclude the maximum level of training from occurring year after year in any multi-year period. A full description of training activities can be found in the original LOA application. For the purposes of this LOA extension request, the Navy assumes that the additional two years of the permit would consist of one additional year of maximum training tempo and one year of representative training tempo. The number of training activities that could occur over any 7-year period are reported in Table 1-1.

1.2.2 TESTING ACTIVITIES

As stated in the original LOA application, the Proposed Action entails a level of testing activities to be conducted into the reasonably foreseeable future, accounting for changes in the types and tempo of testing activities to meet current and future military readiness requirements. This structure remains the same for this LOA extension request. These activities include the testing of new platforms, systems, and related equipment that will be introduced in the future. A full description of testing activities can be found in the original LOA application. For the purposes of this LOA extension request, the Navy assumes that the additional two years of the permit would consist of one additional year of maximum testing tempo and one year of representative testing tempo. The number of testing activities that could occur over any 7-year period are reported in Table 1-2 through Table 1-5.

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Table 1-1: Proposed Training Activities Within the Study Area

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Major Training Events–Large Integrated Anti-Submarine Warfare					
Acoustic	Composite Training Unit Exercise[1]	Aircraft carrier and carrier air wing integrates with surface and submarine units in a challenging multi-threat operational environment that certifies them ready to deploy.	ASW1, ASW2, ASW3, ASW4, ASW5, HF1, LF6, MF1, MF3, MF4, MF5, MF11, MF12	SOCAL	18
Acoustic	Rim of the Pacific Exercise[1]	A biennial multinational training exercise in which navies from Pacific Rim nations and the United Kingdom assemble in Pearl Harbor, Hawaii, to conduct training throughout the Hawaiian Islands in a number of warfare areas. Marine mammal systems may be used during a Rim of the Pacific exercise. Components of a Rim of the Pacific exercise, such as certain mine warfare and amphibious training, may be conducted in the Southern California Range Complex.	ASW2, ASW3, ASW4, HF1, HF3, HF4, M3, MF1, MF3, MF4, MF5, MF11	HRC	4
				SOCAL	4
Major Training Events–Medium Integrated Anti-Submarine Warfare					
Acoustic	Fleet Exercise/Sustainment Exercise[1]	Aircraft carrier and carrier air wing integrates with surface and submarine units in a challenging multi-threat operational environment to maintain ability to deploy.	ASW1, ASW2, ASW3, ASW4, HF1, LF6, MF1, MF3, MF4, MF5, MF11, MF12	HRC	7
				SOCAL	35

1.0 Introduction and Description of Specified Activity

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Event
Major Training Events–Medium Integrated Anti-Submarine Warfare (continued)					
Acoustic	Undersea Warfare Exercise	Elements of the anti-submarine warfare tracking exercise combine in this exercise of multiple air, surface, and subsurface units, over a period of several days. Sonobuoys are released from aircraft. Active and passive sonar used.	ASW3, ASW4, HF1, LF6, MF1, MF3, MF4, MF5, MF11, MF12	HRC	17
Integrated/Coordinated Training–Small Integrated Anti-Submarine Warfare Training					
Acoustic	Navy Undersea Warfare Training and Assessment Course Surface Warfare Advanced Tactical Training	Multiple ships, aircraft, and submarines integrate the use of their sensors to search for, detect, classify, localize, and track a threat submarine in order to launch an exercise torpedo.	ASW3, ASW4, HF1, MF1, MF3, MF4, MF5	HRC	7
				SOCAL	18
Integrated/Coordinated Training–Medium Coordinated Anti-Submarine Warfare Training					
Acoustic	Submarine Commanders Course	Train prospective submarine Commanding Officers to operate against surface, air, and subsurface threats.	ASW3, ASW4, HF1, MF1, MF3, MF4, MF5, TORP1, TORP2	HRC	12
				SOCAL	12

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Integrated/Coordinated Training–Small Coordinated Anti-Submarine Warfare Training					
Acoustic	Amphibious Ready Group/Marine Expeditionary Unit Exercise	Small-scale, short duration, coordinated anti-submarine warfare exercises	ASW2, ASW3, ASW4, HF1, MF1, MF3, MF4, MF5, MF11	HRC	14
	Group Sail Independent Deployer Certification Exercise/Tailored Anti-Submarine Warfare Training			SOCAL	86
Amphibious Warfare					
Explosive	Naval Surface Fire Support Exercise – at Sea	Surface ship uses large-caliber gun to support forces ashore; however, land target simulated at sea. Rounds impact water and are scored by passive acoustic hydrophones located at or near target area.	Large-caliber HE rounds (E5)	HRC (W188)	105
Acoustic	Amphibious Marine Expeditionary Unit Exercise	Navy and Marine Corps forces conduct advanced integration training in preparation for deployment certification.	ASW2, ASW3, ASW4, HF1, MF1, MF3, MF4, MF5, MF11	SOCAL	18
Acoustic	Amphibious Marine Expeditionary Unit Integration Exercise	Navy and Marine Corps forces conduct integration training at sea in preparation for deployment certification.	ASW2, ASW3, ASW4, HF1, MF1, MF3, MF4, MF5, MF11	SOCAL	18

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Amphibious Warfare (continued)					
Acoustic	Marine Expeditionary Unit Composite Training Unit Exercise	Amphibious Ready Group exercises are conducted to validate the Marine Expeditionary Unit's readiness for deployment and includes small boat raids; visit, board, search, and seizure training; helicopter and mechanized amphibious raids; and a non-combatant evacuation operation.	ASW2, ASW3, ASW4, HF1, MF1, MF3, MF4, MF5, MF11	SOCAL	18
Anti-Submarine Warfare					
Acoustic	Anti-Submarine Warfare Torpedo Exercise–Helicopter	Helicopter crews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets.	MF4, MF5, TORP1	HRC	42
				SOCAL	728
Acoustic	Anti-Submarine Warfare Torpedo Exercise–Maritime Patrol Aircraft	Maritime patrol aircraft crews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets.	MF5, TORP1	HRC	70
				SOCAL	175
Acoustic	Anti-Submarine Warfare Torpedo Exercise–Ship	Surface ship crews search for, track, and detect submarines. Exercise torpedoes are used during this event.	ASW3, MF1, TORP1	HRC	350
				SOCAL	819
Acoustic	Anti-Submarine Warfare Torpedo Exercise–Submarine	Submarine crews search for, track, and detect submarines. Exercise torpedoes are used during this event.	ASW4, HF1, MF3, TORP2	HRC	336
				SOCAL	91

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Anti-Submarine Warfare (continued)					
Acoustic	Anti-Submarine Warfare Tracking Exercise–Helicopter	Helicopter crews search for, track, and detect submarines.	MF4, MF5	HRC	1,113
				SOCAL, PMSR	3,668
				HSTT Transit Corridor	42
Acoustic	Anti-Submarine Warfare Tracking Exercise–Maritime Patrol Aircraft	Maritime patrol aircraft aircrews search for, track, and detect submarines. Recoverable air launched torpedoes are employed against submarine targets.	MF5	HRC	182
				SOCAL, PMSR	350
Acoustic	Anti-Submarine Warfare Tracking Exercise–Ship	Surface ship crews search for, track, and detect submarines.	ASW3, MF1, MF11, MF12	HRC	1,568
				SOCAL, PMSR	2,961
Acoustic	Anti-Submarine Warfare Tracking Exercise–Submarine	Submarine crews search for, track, and detect submarines.	ASW4, HF1, HF3, MF3	HRC	1,400
				SOCAL, PMSR	350
				HSTT Transit Corridor	49
Explosive, Acoustic	Service Weapons Test	Air, surface, or submarine crews employ explosive torpedoes against virtual targets.	HF1, MF3, MF6, TORP2, Explosive torpedoes (E11)	HRC	14
				SOCAL	7

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Mine Warfare					
Acoustic	Airborne Mine Countermeasure–Mine Detection	Helicopter aircrews detect mines using towed or laser mine detection systems.	HF4	SOCAL	70
Explosive, Acoustic	Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercises	Maritime security personnel train to protect civilian ports against enemy efforts to interfere with access to those ports.	HF4, SAS2 E2, E4	Pearl Harbor, HI	7
				San Diego, CA	21
Explosive	Marine Mammal Systems	The Navy deploys trained bottlenose dolphins (*Tursiops truncatus*) and California sea lions (*Zalophus californianus*) as part of the marine mammal mine-hunting and object-recovery system.	E7	HRC	70
				SOCAL	1,225
Acoustic	Mine Countermeasure Exercise–Ship Sonar	Ship crews detect and avoid mines while navigating restricted areas or channels using active sonar.	HF4, HF8, MF1K	HRC	210
				SOCAL	664
Acoustic	Mine Countermeasure Exercise - Surface	Mine countermeasure ship crews detect, locate, identify, and avoid mines while navigating restricted areas or channels, such as while entering or leaving port.	HF4	SOCAL	1,862
Explosive, Acoustic	Mine Countermeasures Mine Neutralization Remotely Operated Vehicle	Ship, small boat, and helicopter crews locate and disable mines using remotely operated underwater vehicles.	HF4, E4	HRC	42
				SOCAL	2,604

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Mine Warfare (continued)					
Explosive	Mine Neutralization Explosive Ordnance Disposal	Personnel disable threat mines using explosive charges.	E4, E5, E6, E7	HRC (Puuloa)	140
				SOCAL (IB, TAR 2, TAR 3, TAR 21, SWAT 3, SOAR)	1,358
Acoustic	Submarine Mine Exercise	Submarine crews practice detecting mines in a designated area.	HF1	HRC	280
				SOCAL	84
Acoustic	Surface Ship Object Detection	Ship crews detect and avoid mines while navigating restricted areas or channels using active sonar.	MF1K, HF8	HRC	287
				SOCAL	1,134
Explosive	Underwater Demolitions Multiple Charge–Mat Weave and Obstacle Loading	Military personnel use explosive charges to destroy barriers or obstacles to amphibious vehicle access to beach areas.	E10, E13	SOCAL (TAR 2, TAR 3)	126
Explosive	Underwater Demolition Qualification and Certification	Navy divers conduct various levels of training and certification in placing underwater demolition charges.	E6, E7	HRC (Puuloa)	203
				SOCAL (TAR 2)	700

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Surface Warfare					
Explosive	Bombing Exercise Air-to-Surface	Fixed-wing aircrews deliver bombs against surface targets.	E12[2]	HRC	1309
				SOCAL	4480
				HSTT Transit Corridor	35
Explosive	Gunnery Exercise Surface-to-Surface Boat Medium-Caliber	Small boat crews fire medium-caliber guns at surface targets.	E1, E2	HRC	70
				SOCAL	98
Explosive	Gunnery Exercise Surface-to-Surface Ship Large-caliber	Surface ship crews fire large-caliber guns at surface targets.	E5	HRC	210
				SOCAL	1,302
				HSTT Transit Corridor	91
Explosive	Gunnery Exercise Surface-to-Surface Ship Medium-Caliber	Surface ship crews fire medium-caliber guns at surface targets.	E1, E2	HRC	350
				SOCAL	1,260
				HSTT Transit Corridor	280
Explosive, Acoustic	Independent Deployer Certification Exercise/Tailored Surface Warfare Training	Multiple ships, aircraft and submarines conduct integrated multi-warfare training with a surface warfare emphasis. Serves as a ready-to-deploy certification for individual surface ships tasked with surface warfare missions.	E1, E3, E6, E10	SOCAL	7

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Surface Warfare (continued)					
Explosive	Integrated Live Fire Exercise	Naval Forces defend against a swarm of surface threats (ships or small boats) with bombs, missiles, rockets, and small-, medium- and large-caliber guns.	E1, E3, E6, E10	HRC (W188A)	7
				SOCAL (SOAR)	7
Explosive	Missile Exercise Air-to-Surface	Fixed-wing and helicopter aircrews fire air-to-surface missiles at surface targets.	E6, E8, E10	HRC	70
				SOCAL	1,498
Explosive	Missile Exercise Air-to-Surface Rocket	Helicopter aircrews fire both precision-guided and unguided rockets at surface targets.	E3	HRC	1,598
				SOCAL	1,722
Explosive	Missile Exercise Surface-to-Surface	Surface ship crews defend against surface threats (ships or small boats) and engage them with missiles.	E6, E10	HRC (W188)	140
				SOCAL (W291)	70
Explosive, Acoustic	Sinking Exercise	Aircraft, ship, and submarine crews deliberately sink a seaborne target, usually a decommissioned ship made environmentally safe for sinking according to U.S. Environmental Protection Agency standards, with a variety of munitions.	TORP2, E5, E10, E12	HRC	21
				SOCAL	4
Pile driving	Elevated Causeway System	A pier is constructed off of the beach. Piles are driven into the bottom with an impact hammer. Piles are removed from seabed via vibratory extractor. Only in-water impacts are analyzed.	Impact hammer or vibratory extractor	SOCAL	14

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Other Training Exercises (continued)					
Acoustic	Kilo Dip	Functional check of the dipping sonar prior to conducting a full test or training event on the dipping sonar.	MF4	HRC	420
				SOCAL	16,800
Acoustic	Submarine Navigation Exercise	Submarine crews operate sonar for navigation and object detection while transiting into and out of port during reduced visibility.	HF1, MF3	Pearl Harbor, HI	1,540
				San Diego Bay, CA	560
Acoustic	Submarine Sonar Maintenance and Systems Checks	Maintenance of submarine sonar systems is conducted pierside or at sea.	MF3	HRC	1,820
				Pearl Harbor, HI	1,820
				SOCAL	651
				San Diego Bay, CA	644
				HSTT Transit Corridor	70
Acoustic	Submarine Under-Ice Certification	Submarine crews train to operate under ice. Ice conditions are simulated during training and certification events.	HF1	HRC	84
				SOCAL	42

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Table 1-1: Proposed Training Activities Within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Other Training Exercises (continued)					
Acoustic	Surface Ship Sonar Maintenance and Systems Checks	Maintenance of surface ship sonar systems is conducted pierside or at sea.	HF8, MF1	HRC	525
				Pearl Harbor, HI	560
				SOCAL	1,750
				San Diego, CA	1,750
				HSTT Transit Corridor	56
Acoustic	Unmanned Underwater Vehicle Training – Certification and Development	Unmanned underwater vehicle certification involves training with unmanned platforms to ensure submarine crew proficiency. Tactical development involves training with various payloads for multiple purposes to ensure that the systems can be employed effectively in an operational environment.	FLS2, M3, SAS2	HRC	175
				SOCAL	70

Notes: HRC = Hawaii Range Complex, SOCAL = Southern California Range Complex, HSTT = Hawaii-Southern California Training and Testing, PMSR = Point Mugu Sea Range Overlap, TAR = Training Area and Range, SOAR = Southern California Anti-Submarine Warfare Range, IB = Imperial Beach Minefield
1. Any non-antisubmarine warfare activity that could occur is captured in the individual activities.
2. For the Bombing Exercise Air-to-Surface, all activities were analyzed using E12 explosive bin, but smaller explosives are frequently used.

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1.2.2.1 Naval Air Systems Command

Table 1-2: Naval Air Systems Command Proposed Testing Activities Within the Study Area

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Anti-Submarine Warfare					
Acoustic	Anti-Submarine Warfare Torpedo Test	This event is similar to the training event torpedo exercise. Test evaluates anti-submarine warfare systems onboard rotary-wing and fixed-wing aircraft and the ability to search for, detect, classify, localize, track, and attack a submarine or similar target.	MF5, TORP1	HRC	134
				SOCAL	353
Explosive, Acoustic	Anti-Submarine Warfare Tracking Test–Helicopter	This event is similar to the training event anti-submarine tracking exercise–helicopter. The test evaluates the sensors and systems used to detect and track submarines and to ensure that helicopter systems used to deploy the tracking systems perform to specifications.	MF4, MF5, E3	SOCAL	414
Explosive, Acoustic	Anti-Submarine Warfare Tracking Test–Maritime Patrol Aircraft	The test evaluates the sensors and systems used by maritime patrol aircraft to detect and track submarines and to ensure that aircraft systems used to deploy the tracking systems perform to specifications and meet operational requirements.	ASW2, ASW5, MF5, MF6, E1, E3	HRC	399
				SOCAL	436

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Table 1-2: Naval Air Systems Command Proposed Testing Activities within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Anti-Submarine Warfare (continued)					
Explosive, Acoustic	Sonobuoy Lot Acceptance Test	Sonobuoys are deployed from surface vessels and aircraft to verify the integrity and performance of a lot or group of sonobuoys in advance of delivery to the fleet for operational use.	ASW2, ASW5, HF5, HF6, LF4, MF5, MF6, E1, E3, E4	SOCAL	1,120
Mine Warfare					
Acoustic	Airborne Dipping Sonar Minehunting Test	A mine-hunting dipping sonar system that is deployed from a helicopter and uses high-frequency sonar for the detection and classification of bottom and moored mines.	HF4	SOCAL	24
Explosive	Airborne Mine Neutralization System Test	A test of the airborne mine neutralization system that evaluates the system's ability to detect and destroy mines from an airborne mine countermeasures capable helicopter (e.g., MH-60). The airborne mine neutralization system uses up to four unmanned underwater vehicles equipped with high-frequency sonar, video cameras, and explosive and non-explosive neutralizers.	E4	SOCAL	117
Acoustic	Airborne Sonobuoy Minehunting Test	A mine-hunting system made up of sonobuoys deployed from a helicopter. A field of sonobuoys, using high-frequency sonar, is used for detection and classification of bottom and moored mines.	HF6	SOCAL	33

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Table 1-2: Naval Air Systems Command Proposed Testing Activities within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Surface Warfare					
Explosive	Air-to-Surface Bombing Test	This event is similar to the training event bombing exercise air-to-surface. Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced.	E9	HRC	56
				SOCAL	98
Explosive	Air-to-Surface Gunnery Test	This event is similar to the training event gunnery exercise air-to-surface. Fixed-wing and rotary-wing aircrews evaluate new or enhanced aircraft guns against surface maritime targets to test that the gun, gun ammunition, or associated systems meet required specifications or to train aircrew in the operation of a new or enhanced weapons system.	E1	HRC	35
				SOCAL	330
Explosive	Air-to-Surface Missile Test	This event is similar to the training event missile exercise air-to-surface. Test may involve both fixed-wing and rotary-wing aircraft launching missiles at surface maritime targets to evaluate the weapons system or as part of another systems integration test.	E6, E9, E10	HRC	126
				SOCAL	384

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Table 1-2: Naval Air Systems Command Proposed Testing Activities within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Surface Warfare (continued)					
Explosive	Rocket Test	Rocket tests are conducted to evaluate the integration, accuracy, performance, and safe separation of guided and unguided 2.75-inch rockets fired from a hovering or forward flying helicopter or tilt rotor aircraft.	E3	HRC	14
				SOCAL	142
Other Testing Activities					
Acoustic	Kilo Dip	Functional check of a helicopter deployed dipping sonar system (e.g., AN/AQS-22) prior to conducting a testing or training event using the dipping sonar system.	MF4	SOCAL	12
Acoustic	Undersea Range System Test	Post installation node survey and test and periodic testing of range node transmit functionality.	MF9	HRC	129

Notes: HRC = Hawaii Range Complex, SOCAL = Southern California Range Complex

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1.2.2.2   Naval Sea Systems Command

Table 1-3: Naval Sea Systems Command Proposed Testing Activities Within the Study Area

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Anti-Submarine Warfare					
Acoustic	Anti-Submarine Warfare Mission Package Testing	Ships and their supporting platforms (e.g., rotary-wing aircraft and unmanned aerial systems) detect, localize, and prosecute submarines.	ASW1, ASW2, ASW3, ASW5, MF1, MF4, MF5, MF12, TORP1	HRC	154
				SOCAL	161
Acoustic	At-Sea Sonar Testing	At-sea testing to ensure systems are fully functional in an open ocean environment.	ASW3, ASW4, HF1, LF4, LF5, M3, MF1, MF1K, MF2, MF3, MF5, MF9, MF10, MF11	HRC	109
				HRC - SOCAL	7
				SOCAL	138
Acoustic	Countermeasure Testing	Countermeasure testing involves the testing of systems that will detect, localize, and track incoming weapons, including marine vessel targets. Testing includes surface ship torpedo defense systems and marine vessel stopping payloads.	ASW3, ASW4, HF5, TORP1, TORP2	HRC	56
				HRC - SOCAL	28
				SOCAL	77
				HSTT Transit Corridor	14
Acoustic	Pierside Sonar Testing	Pierside testing to ensure systems are fully functional in a controlled pierside environment prior to at-sea test activities.	HF1, HF3, HF8, M3, MF1, MF3, MF9	Pearl Harbor, HI	49
				San Diego, CA	49

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Table 1-3: Naval Sea Systems Command Proposed Testing Activities within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Anti-Submarine Warfare (continued)					
Acoustic	Submarine Sonar Testing/Maintenance	Pierside and at-sea testing of submarine systems occurs periodically following major maintenance periods and for routine maintenance.	HF1, HF3, M3, MF3	HRC	28
				Pearl Harbor, HI	119
				San Diego, CA	168
Acoustic	Surface Ship Sonar Testing/Maintenance	Pierside and at-sea testing of ship systems occurs periodically following major maintenance periods and for routine maintenance.	ASW3, MF1, MF1K, MF9, MF10	HRC	21
				Pearl Harbor, HI	21
				San Diego, CA	21
				SOCAL	21
Explosive, Acoustic	Torpedo (Explosive) Testing	Air, surface, or submarine crews employ explosive and non-explosive torpedoes against artificial targets.	ASW3, HF1, HF5, HF6, MF1, MF3, MF4, MF5, MF6, TORP1, TORP2, E8, E11	HRC (W188)	56
				HRC (W188) SOCAL	21
				SOCAL	56
Acoustic	Torpedo (Non-Explosive) Testing	Air, surface, or submarine crews employ non-explosive torpedoes against submarines or surface vessels.	ASW3, ASW4, HF1, HF6, M3, MF1, MF3, MF4, MF5, MF6, TORP1, TORP2, TORP3	HRC	56
				HRC SOCAL	63
				SOCAL	56

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Table 1-3: Naval Sea Systems Command Proposed Testing Activities within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Mine Warfare					
Explosive, Acoustic	Mine Countermeasure and Neutralization Testing	Air, surface, and subsurface vessels neutralize threat mines and mine-like objects.	HF4, E4	SOCAL	70
Explosive, Acoustic	Mine Countermeasure Mission Package Testing	Vessels and associated aircraft conduct mine countermeasure operations.	HF4, SAS2, E4	HRC	118
				SOCAL	406
Acoustic	Mine Detection and Classification Testing	Air, surface, and subsurface vessels detect and classify mines and mine-like objects. Vessels also assess their potential susceptibility to mines and mine-like objects.	HF1, HF8, MF1, MF5	HRC	14
				HRC SOCAL	10
				SOCAL	77
Surface Warfare					
Explosive	Gun Testing–Large-Caliber	Surface crews defend against surface targets with large-caliber guns.	E3	HRC	49
				HRC - SOCAL	504
				SOCAL	49
Explosive	Gun Testing–Medium-Caliber	Surface crews defend against surface targets with medium-caliber guns.	E1	HRC	28
				HRC - SOCAL	336
				SOCAL	28
Explosive	Missile and Rocket Testing	Missile and rocket testing includes various missiles or rockets fired from submarines and surface combatants. Testing of the launching system and ship defense is performed.	E6	HRC	91
				HRC - SOCAL	168
				SOCAL	140

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Table 1-3: Naval Sea Systems Command Proposed Testing Activities within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Unmanned Systems					
Acoustic	Unmanned Surface Vehicle System Testing	Testing involves the production or upgrade of unmanned surface vehicles. This may include tests of mine detection capabilities, evaluations of the basic functions of individual platforms, or complex events with multiple vehicles.	HF4, SAS2	HRC	21
				SOCAL	28
Acoustic	Unmanned Underwater Vehicle Testing	Testing involves the production or upgrade of unmanned underwater vehicles. This may include tests of mine detection capabilities, evaluations of the basic functions of individual platforms, or complex events with multiple vehicles.	HF4, MF9	HRC	21
				SOCAL	2,037
Vessel Evaluation					
Acoustic	Submarine Sea Trials–Weapons System Testing	Submarine weapons and sonar systems are tested at-sea to meet the integrated combat system certification requirements.	HF1, M3, MF3, MF9, MF10, TORP2	HRC	7
				SOCAL	7
Explosive	Surface Warfare Testing	Tests the capabilities of shipboard sensors to detect, track, and engage surface targets. Testing may include ships defending against surface targets using explosive and non-explosive rounds, gun system structural test firing, and demonstration of the response to Call for Fire against land-based targets (simulated by sea-based locations).	E1, E5, E8	HRC	63
				HRC - SOCAL	441
				SOCAL	102

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Table 1-3: Naval Sea Systems Command Proposed Testing Activities within the Study Area (continued)

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Vessel Evaluation (continued)					
Acoustic	Undersea Warfare Testing	Ships demonstrate capability of countermeasure systems and underwater surveillance, weapons engagement, and communications systems. This tests ships ability to detect, track, and engage undersea targets.	ASW4, HF4, HF8, MF1, MF4, MF5, MF6, TORP1, TORP2	HRC	49
				HRC SOCAL	60
				SOCAL	69
Acoustic	Vessel Signature Evaluation	Surface ship, submarine and auxiliary system signature assessments. This may include electronic, radar, acoustic, infrared and magnetic signatures.	ASW3	HRC	28
				HRC SOCAL	252
				SOCAL	168
Other Testing Activities					
Acoustic	Insertion/Extraction	Testing of submersibles capable of inserting and extracting personnel and payloads into denied areas from strategic distances.	M3, MF9	HRC	7
				SOCAL	7
Acoustic	Signature Analysis Operations	Surface ship and submarine testing of electromagnetic, acoustic, optical, and radar signature measurements.	HF1, M3, MF9	HRC	14
				SOCAL	7

Notes: HRC = Hawaii Range Complex, SOCAL = Southern California Range Complex, HSTT = Hawaii-Southern California Training and Testing, CA = California, HI = Hawaii

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1.2.2.3   Office of Naval Research

Table 1-4: Office of Naval Research Proposed Testing Activities Within the Study Area

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Acoustic and Oceanographic Science and Technology					
Explosive, Acoustic	Acoustic and Oceanographic Research	Research using active transmissions from sources deployed from ships and unmanned underwater vehicles. Research sources can be used as proxies for current and future Navy systems.	AG, ASW2, BB4, BB9, LF3, LF4, LF5, MF8, MF9, MF9, MF9, E3	HRC	14
				SOCAL	28
Acoustic	Long Range Acoustic Communications	Bottom mounted acoustic source off of the Hawaiian Island of Kauai will transmit a variety of acoustic communications sequences.	LF4	HRC	21

Notes: HRC = Hawaii Range Complex, SOCAL = Southern California Range Complex

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1.2.2.4 Space and Naval Warfare Systems Command

Table 1-5: Space and Naval Warfare Systems Command Proposed Testing Activities Within the Study Area

Stressor Category	Activity Name	Description	Source Bin	Location	7-Year # of Events
Acoustic	Anti-Terrorism/Force Protection	Testing sensor systems that can detect threats to naval piers, ships, and shore infrastructure.	SD1	San Diego, CA	98
				SOCAL	112
Acoustic	Communications	Testing of underwater communications and networks to extend the principles of FORCEnet below the ocean surface.	ASW2, ASW5, HF6, LF4	HRC	5
				SOCAL	70
Acoustic	Energy and Intelligence, Surveillance, and Reconnaissance Sensor Systems	Develop, integrate, and demonstrate Intelligence, Surveillance, and Reconnaissance systems and in-situ energy systems to support deployed systems.	AG, HF2, HF7, LF4, LF5, LF6, MF10	HRC	87
				SOCAL	357
				HSTT Transit Corridor	56
Acoustic	Vehicle Testing	Testing of surface and subsurface vehicles and sensor systems that may involve Unmanned Underwater Vehicles, gliders, and Unmanned Surface Vehicles.	BB4, FLS2, FLS3, HF6, LF3, M3, MF9, MF13, SAS1, SAS2, SAS3	HRC	8
				SOCAL	1,141
				HSTT Transit Corridor	14

Notes: HRC = Hawaii Range Complex, SOCAL = Southern California Range Complex, HSTT = Hawaii-Southern California Training and Testing, CA = California

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1.2.3 SUMMARY OF ACOUSTIC AND EXPLOSIVE STRESSORS ANALYZED FOR TRAINING AND TESTING

In the original LOA application, Table 1-12 through Table 1-15 showed the acoustic and explosive source bins and numbers used, air gun sources and numbers used, and numbers of pile driving and removal activities associated with Navy training and testing activities in the HSTT Study Area, both annually and over five years. For this LOA extension request, Table 1-6 through Table 1-8 share the same information, however the bin totals are presented for seven years.

Table 1-6: Acoustic Source Classes Analyzed and Numbers Used During Training and Testing Activities

Source Class Category	Bin	Description	Unit[1]	Training 7-year Total	Testing 7-year Total
Low-Frequency (LF): Sources that produce signals less than 1 kHz	LF3	LF sources greater than 200 dB	H	0	1,365
	LF4	LF sources equal to 180 dB and up to 200 dB	H	0	4,496
			C	0	140
	LF5	LF sources less than 180 dB	H	65	14,458
	LF6	LF sources greater than 200 dB with long pulse lengths	H	956	360
Mid-Frequency (MF): Tactical and non-tactical sources that produce signals between 1 and 10 kHz	MF1	Hull-mounted surface ship sonars (e.g., AN/SQS-53C and AN/SQS-61)	H	38,489	8,692
	MF1K	Kingfisher mode associated with MF1 sonars	H	700	98
	MF2[2]	Hull-mounted surface ship sonars (e.g., AN/SQS-56)	H	0	378
	MF3	Hull-mounted submarine sonars (e.g., AN/BQQ-10)	H	14,700	9,177
	MF4	Helicopter-deployed dipping sonars (e.g., AN/AQS-22 and AN/AQS-13)	H	2,719	2,502
	MF5	Active acoustic sonobuoys (e.g., DICASS)	C	40,128	38,233

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Table 1-6: Acoustic Source Classes Analyzed and Numbers Used During Training and Testing Activities (continued)

Source Class Category	Bin	Description	Unit[1]	Training 7-year Total	Testing 7-year Total
Mid-Frequency (MF) (continued)	MF6	Active underwater sound signal devices (e.g., MK 84)	C	63	8,202
	MF8	Active sources (greater than 200 dB) not otherwise binned	H	0	490
	MF9	Active sources (equal to 180 dB and up to 200 dB) not otherwise binned	H	0	36,056
	MF10	Active sources (greater than 160 dB, but less than 180 dB) not otherwise binned	H	0	13,104
	MF11	Hull-mounted surface ship sonars with an active duty cycle greater than 80%	H	5,205	392
	MF12	Towed array surface ship sonars with an active duty cycle greater than 80%	H	1,260	4,620
	MF13	MF sonar source	H	0	2,100
High-Frequency (HF): Tactical and non-tactical sources that produce signals between 10 and 100 kHz	HF1	Hull-mounted submarine sonars (e.g., AN/BQQ-10)	H	12,550	5,403
	HF2	HF Marine Mammal Monitoring System	H	0	840
	HF3	Other hull-mounted submarine sonars (classified)	H	1,919	769
	HF4	Mine detection, classification, and neutralization sonar (e.g., AN/SQS-20)	H	15,012	114,069

1.0 Introduction and Description of Specified Activity

Table 1-6: Acoustic Source Classes Analyzed and Numbers Used During Training and Testing Activities (continued)

Source Class Category	Bin	Description	Unit[1]	Training 7-year Total	Testing 7-year Total
High-Frequency (HF) (continued)	HF5	Active sources (greater than 200 dB) not otherwise binned	H	0	6,720
			C	0	280
	HF6	Active sources (equal to 180 dB and up to 200 dB) not otherwise binned	H	0	7,015
	HF7	Active sources (greater than 160 dB, but less than 180 dB) not otherwise binned	H	0	9,660
	HF8	Hull-mounted surface ship sonars (e.g., AN/SQS-61)	H	711	5,136
Anti-Submarine Warfare (ASW): Tactical sources (e.g., active sonobuoys and acoustic countermeasures systems) used during ASW training and testing activities	ASW1	MF systems operating above 200 dB	H	1,503	3,290
	ASW2	MF Multistatic Active Coherent sonobuoy (e.g., AN/SSQ-125)	C	4,824	32,900
	ASW3	MF towed active acoustic countermeasure systems (e.g., AN/SLQ-25)	H	37,385	19,187
	ASW4	MF expendable active acoustic device countermeasures (e.g., MK 3)	C	9,023	15,398
	ASW5[3]	MF sonobuoys with high duty cycles	H	1,780	3,854

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**Table 1-6: Acoustic Source Classes Analyzed and Numbers Used During Training and Testing
Activities (continued)**

Source Class Category	Bin	Description	Unit[1]	Training 7-year Total	Testing 7-year Total
Torpedoes (TORP): Source classes associated with the active acoustic signals produced by torpedoes	TORP1	Lightweight torpedo (e.g., MK 46, MK 54, or Anti-Torpedo Torpedo)	C	1,605	6,454
	TORP2	Heavyweight torpedo (e.g., MK 48)	C	3,515	2,756
	TORP3		C	0	315
Forward Looking Sonar (FLS): Forward or upward looking object avoidance sonars used for ship navigation and safety	FLS2	HF sources with short pulse lengths, narrow beam widths, and focused beam patterns	H	196	3,424
	FLS3	VHF sources with short pulse lengths, narrow beam widths, and focused beam patterns	H	0	18,480
Acoustic Modems (M): Systems used to transmit data through the water	M3	MF acoustic modems (greater than 190 dB)	H	274	3,623
Swimmer Detection Sonars (SD): Systems used to detect divers and submerged swimmers	SD1–SD2	HF and VHF sources with short pulse lengths, used for the detection of swimmers and other objects for the purpose of port security	H	0	70
Synthetic Aperture Sonars (SAS): Sonars in which active acoustic signals are post-processed to form high-resolution images of the seafloor	SAS1	MF SAS systems	H	0	13,720
	SAS2	HF SAS systems	H	6,297	60,088
	SAS3	VHF SAS systems	H	0	32,200
	SAS4	MF to HF broadband mine countermeasure sonar	H	294	0

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Table 1-6: Acoustic Source Classes Analyzed and Numbers Used During Training and Testing Activities (continued)

Source Class Category	Bin	Description	Unit[1]	Training 7-year Total	Testing 7-year Total
Broadband Sound Sources (BB): Sonar systems with large frequency spectra, used for various purposes	BB4	LF to MF oceanographic source	H	0	6,414
	BB7	LF oceanographic source	C	0	196
	BB9	MF optoacoustic source	H	0	3,360

[1] H = hours; C = count (e.g., number of individual pings or individual sonobuoys).
[2] MF2/MF2K are sources on frigate class ships, which were decommissioned during Phase II.
[3] Formerly ASW2 (H) in Phase II.
Notes: dB = decibel(s), kHz = kilohertz, VHF = very high frequency

Table 1-7 shows the number of air gun shots that could occur over seven years under the Proposed Action for training and testing activities.

Table 1-7: Training and Testing Air Gun Sources Quantitatively Analyzed in the Study Area

Source Class Category	Bin	Unit[1]	Training 7-year Total	Testing 7-year Total
Air Guns (AG): small underwater air guns	AG	C	0	5,908

[1] C = count. One count (C) of AG is equivalent to 100 air gun firings.

Table 1-8 shows the explosive source bin use that could occur over seven years under the Proposed Action for training and testing activities. Under the Proposed Action, explosive bin use would vary annually as was previously described in the original LOA application. Similar to the 5-year totals in the original LOA application, the 7-year totals for the Proposed Action take into account that annual variability.

Table 1-8: Explosive Source Bins Analyzed and Numbers Used During Training and Testing Activities

Bin	Net Explosive Weight (lb.)	Example Explosive Source	Modeled Underwater Detonation Depths (ft.)[1]	Training 7-year Total	Testing 7-year Total
E1	0.1–0.25	Medium-caliber projectiles	0.3, 60	20,580	87,012
E2	> 0.25–0.5	Medium-caliber projectiles	0.3, 50	12,222	0
E3	> 0.5–2.5	Large-caliber projectiles	0.3, 60	19,579	20,848
E4	> 2.5–5	Mine neutralization charge	10, 16, 33, 50, 61, 65, 650	266	4,372
E5	> 5–10	5 in. projectiles	0.3, 10, 50	33,310	9,800
E6	> 10–20	Hellfire missile	0.3, 10, 50, 60	4,056	230
E7	> 20–60	Demo block/ shaped charge	10, 50, 60	91	0
E8	> 60–100	Lightweight torpedo	0.3, 150	241	399
E9	> 100–250	500 lb. bomb	0.3	2,950	28
E10	> 250–500	Harpoon missile	0.3	1,543	210
E11	> 500–650	650 lb. mine	61, 150	69	84
E12	> 650–1,000	2,000 lb. bomb	0.3	114	0
E13	> 1,000–1,740	Multiple Mat Weave charges	NA[3]	63	0

[1] Net Explosive Weight refers to the amount of explosives; the actual weight of a munition may be larger due to other components.

[2] HBX refers to the high blast explosive family of binary explosives composed of royal demolition explosive (explosive nitroamine), trinitrotoluene (TNT), powdered aluminum, and D-2 wax with calcium chloride.

[3] Not modeled because charge is detonated in surf zone; not a single E13 charge, but multiple smaller charges detonated in quick succession

Notes: in. = inch(es), lb. = pound(s), ft. = feet

1.2.4 STANDARD OPERATING PROCEDURES

For training and testing to be effective, units must be able to safely use their sensors and weapon systems as they are intended to be used in a real-world situation and to their optimum capabilities. A list of Standard Operating Procedures was presented in the original LOA application, and for this LOA extension request, there would be no change to the Standard Operating Procedures.

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1.2.5 MITIGATION MEASURES

The Navy implements mitigation to avoid or reduce potential impacts on marine mammals during numerous activities involving anti-submarine warfare, mine warfare, expeditionary warfare, surface warfare, and other warfare areas. Procedural mitigation and geographic mitigation is already being implemented and would continue to be implemented during an additional two years of permitted activity. The mitigation measures presented in this LOA extension request are the same mitigation measures as those presented in the NMFS Final Rule (83 Federal Register 66846).

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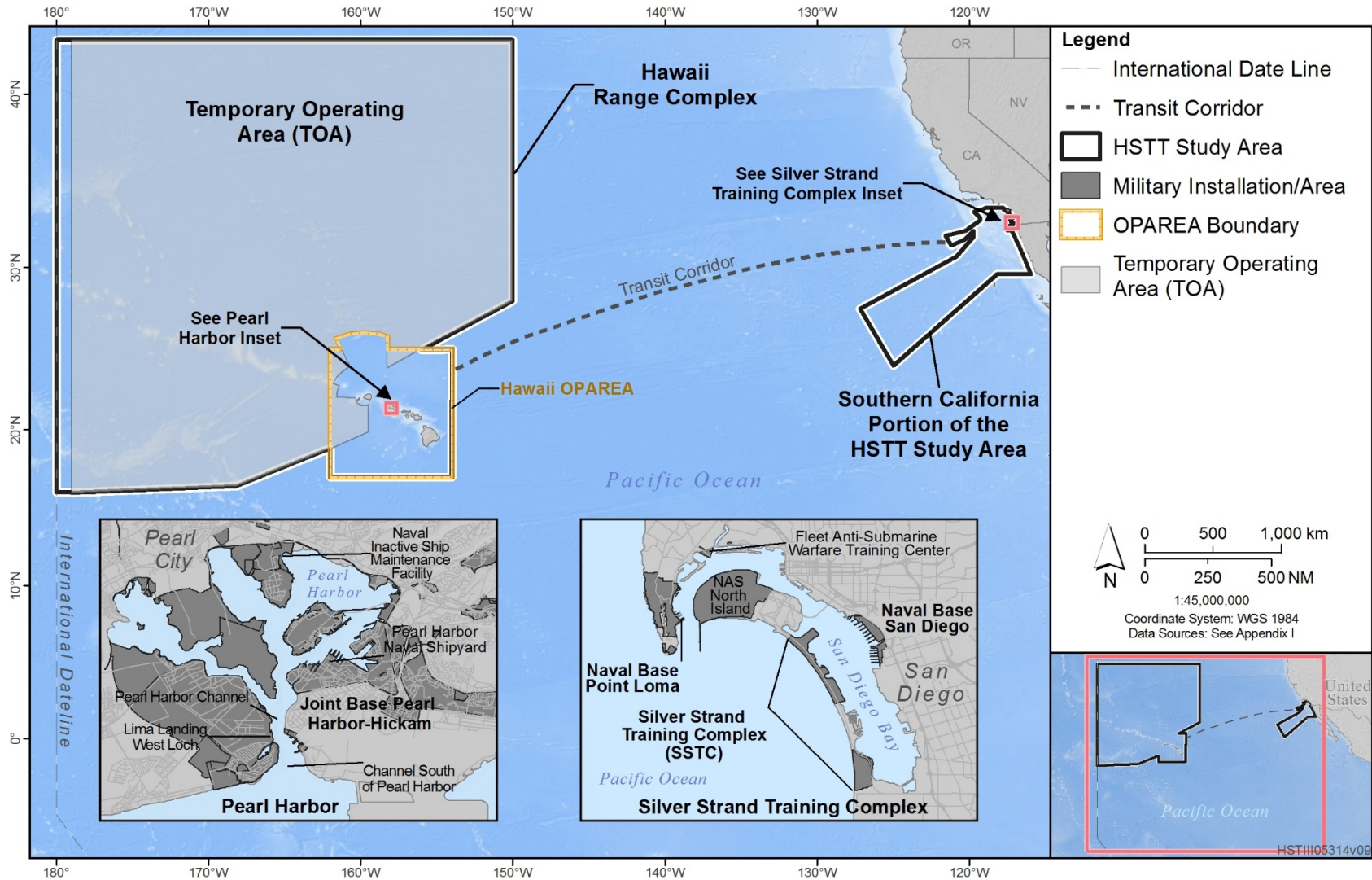# 2 DATES, DURATION, AND SPECIFIED GEOGRAPHIC REGION

National Marine Fisheries Service (NMFS) rule-making established regulations and issued LOAs for training and testing activities in the HSTT Study Area throughout the year from 2018 through 2023, as requested in the original LOA application.

This LOA extension seeks regulations and LOAs for a 7-year period, the full duration allowed by law, making the full timeframe of the amended LOAs from December 21, 2018, to December 20, 2025. There is no change in this request to the geographic extent of the HSTT Study Area, which includes established operating and warning areas across the northcentral Pacific Ocean, from the mean high tide line in Southern California west to Hawaii and the International Date Line. The Study Area includes the at-sea areas of three existing range complexes (the Hawaii Range Complex, the Southern California Range Complex, and the Silver Strand Training Complex), and overlaps a portion of the Point Mugu Sea Range. Also included in the Study Area are Navy pierside locations in Hawaii and Southern California, Pearl Harbor, San Diego Bay, and the transit corridor[1] on the high seas where sonar training and testing may occur. The Study Area and typical transit corridor are depicted in Figure 2-1.

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[1] Vessel transit corridors are the routes typically used by Navy assets to traverse from one area to another. The route depicted in Figure 2-1 is the shortest route between Hawaii and Southern California, making it the quickest and most fuel efficient. Depicted vessel transit corridor is notional and may not represent the actual routes used by ships and submarines transiting from Southern California to Hawaii and back. Actual routes navigated are based on a number of factors including, but not limited to, weather and training, testing, and operational requirements.

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Figure 2-1: Hawaii-Southern California Training and Testing Study Area

Notes: HSTT = Hawaii-Southern California Training and Testing, NAS = Naval Air Station

2.0 Dates, Duration, and Specified Geographic Region

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3 SPECIES AND NUMBERS OF MARINE MAMMALS

Thirty-eight marine mammal species are known to occur in the HSTT Study Area, including 7 mysticetes (baleen whales), 24 odontocete species (dolphins and toothed whales), 1 odontocete species group (Mesoplodont beaked whales), and 6 pinnipeds (seals and sea lions). Among these species there are multiple stocks managed by NMFS in the U.S. Exclusive Economic Zone. These species and stocks are presented in Table 3-1 along with an abundance estimate, an associated coefficient of variation value, and minimum abundance, each based upon the most recent applicable 2017 final Stock Assessment Reports from NMFS (Carretta et al., 2018a; Muto et al., 2018a). For completeness, the Navy also updated as indicated in Table 3-1, those stocks that are pending revisions from NMFS' 2018 draft stock assessment reports (Carretta et al., 2018b; Muto et al., 2018b).

For each species and stock, relevant information on their status, distribution, population trends, and ecology was presented in Chapter 4 (Affected Species Status and Distribution) of the original LOA application, incorporating the best available science at the time (as shown in Table 3-1).

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Table 3-1: Marine Mammals Occurrence Within the HSTT Study Area

Common Name	Scientific Name	Stock	Status		Occurrence	Seasonal Absence	Stock Abundance (CV)/Minimum Population *
			MMPA	ESA			
Blue whale	*Balaenoptera musculus*	Eastern North Pacific	Depleted	Endangered	Southern California	–	1,647 (0.07)/1,551
		Central North Pacific	Depleted	Endangered	Hawaii	Summer	133 (1.09)/63
Bryde's whale	*Balaenoptera brydei/edeni*	Eastern Tropical Pacific	–	–	Southern California	–	unk
		Hawaiian	Depleted	–	Hawaii	–	1,751 (0.29)/1,378
Fin whale	*Balaenoptera physalus*	California, Oregon, and Washington	Depleted	Endangered	Southern California	–	9,029 (0.12)/8,127
		Hawaiian	Depleted	Endangered	Hawaii	Summer	154 (1.05)/75
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	–	–	Southern California	–	26,960* (0.05)/25,849
		Western North Pacific	Depleted	Endangered	Southern California	–	175* (0.05)/167
Humpback whale	*Megaptera novaeangliae*	California, Oregon, Washington	Depleted	Threatened/ Endangered[1]	Southern California	–	2,900* (0.048)/2,784
		Central North Pacific	–	–	Hawaii	Summer	10,103 (0.30)/7,891

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Table 3-1: Marine Mammals Occurrence within the HSTT Study Area (continued)

Common Name	Scientific Name	Stock	Status		Occurrence	Seasonal Absence	Stock Abundance (CV)/Minimum Population
			MMPA	ESA			
Minke whale	*Balaenoptera acutorostrata*	California, Oregon, and Washington	–	–	Southern California	–	636 (0.72)/369
		Hawaiian	–	–	Hawaii	Summer	unk
Sei whale	*Balaenoptera borealis*	Eastern North Pacific	Depleted	Endangered	Southern California	–	519 (0.4)/374
		Hawaii	Depleted	Endangered	Hawaii	Summer	391 (0.90)/204
Sperm whale	*Physeter macrocephalus*	California, Oregon, and Washington	Depleted	Endangered	Southern California	–	1,997 (0.57)/1,270
		Hawaiian	Depleted	Endangered	Hawaii	–	4,559 (0.33)/3,478
Pygmy sperm whale	*Kogia breviceps*	California, Oregon, and Washington	–	–	Southern California	Winter & Fall	4,111 (1.12)/1,924
		Hawaiian	–	–	Hawaii	–	unk
Dwarf sperm whale	*Kogia sima*	California, Oregon, and Washington	–	–	Southern California	–	unk
		Hawaiian	–	–	Hawaii	–	unk
Baird's beaked whale	*Berardius bairdii*	California, Oregon, and Washington	–	–	Southern California	–	2,697 (0.60)/1,633
Blainville's beaked whale	*Mesoplodon densirostris*	Hawaiian	–	–	Hawaii	–	2,105 (1.13)/980

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Table 3-1: Marine Mammals Occurrence within the HSTT Study Area (continued)

Common Name	Scientific Name	Stock	Status		Occurrence	Seasonal Absence	Stock Abundance (CV)/Minimum Population
			MMPA	ESA			
Cuvier's beaked whale	*Ziphius cavirostris*	California, Oregon, and Washington	–	–	Southern California	–	3,247 (0.67)/2,059
		Hawaii Pelagic	–	–	Hawaii	–	723 (0.69)/428
Longman's beaked whale	*Indopacetus pacificus*	Hawaiian	–	–	Hawaii	–	7,619 (0.66)/4,592
Mesoplodont beaked whales	*Mesoplodon spp.*	California, Oregon, and Washington	–	–	Southern California	–	3,044 (0.54)/1,967
Common Bottlenose dolphin	*Tursiops truncatus*	California Coastal	–	–	Southern California	–	453 (0.06)/346
		California, Oregon, and Washington Offshore	–	–	Southern California	–	1,924 (0.54)/1,255
		Hawaiian Pelagic	–	–	Hawaii	–	21,815 (0.57)/13,957
		Kauai and Niihau	–	–	Hawaii	–	unk
		Oahu	–	–	Hawaii	–	unk
		4-Islands	–	–	Hawaii	–	unk
		Hawaii Island	–	–	Hawaii	–	unk

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Table 3-1: Marine Mammals Occurrence within the HSTT Study Area (continued)

Common Name	Scientific Name	Stock	Status		Occurrence	Seasonal Absence	Stock Abundance (CV)/Minimum Population
			MMPA	ESA			
False killer whale	*Pseudorca crassidens*	Main Hawaiian Islands Insular	Depleted	Endangered	Hawaii	–	167 (0.14)/149
		Hawaii Pelagic	–	–	Hawaii	–	1,540 (0.66)/928
		Northwestern Hawaiian Islands	–	–	Hawaii	–	617 (1.11)/290
Fraser's dolphin	*Lagenodelphis hosei*	Hawaiian	–	–	Hawaii	–	51,491 (0.66)/31,034
Killer whale	*Orcinus orca*	Eastern North Pacific Offshore	–	–	Southern California	–	300* (0.10)/276
		Eastern North Pacific Transient/West Coast Transient[2]	–	–	Southern California	–	243 unk/243
		Hawaiian	–	–	Hawaii	–	146 (0.96)/74
Long-beaked common dolphin	*Delphinus capensis*	California	–	–	Southern California	–	101,305 (0.49)/68,432
Melon-headed whale	*Peponocephala electra*	Hawaiian Islands	–	–	Hawaii	–	8,666 (1.00)/4,299
		Kohala Resident	–	–	Hawaii	–	447 (0.12)/404
Northern right whale dolphin	*Lissodelphis borealis*	California, Oregon, & Washington	–	–	Southern California	–	26,556 (0.44)/18,608

3.0 Species and Numbers of Marine Mammals

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Table 3-1: Marine Mammals Occurrence within the HSTT Study Area (continued)

Common Name	Scientific Name	Stock	Status		Occurrence	Seasonal Absence	Stock Abundance (CV)/Minimum Population
			MMPA	ESA			
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	California, Oregon, & Washington	–	–	Southern California	–	26,814 (0.28)/21,195
Pantropical spotted dolphin	*Stenella attenuata*	Oahu	–	–	Hawaii	–	unk
		4-Islands	–	–	Hawaii	–	unk
		Hawaii Island	–	–	Hawaii	–	unk
		Hawaii Pelagic	–	–	Hawaii	–	55,795 (0.40)/40,338
Pygmy killer whale	*Feresa attenuata*	Tropical	–	–	Southern California	Winter & Spring	unk
		Hawaiian	–	–	Hawaii	–	10,640 (0.53)/6,998
Risso's dolphins	*Grampus griseus*	California, Oregon, & Washington	–	–	Southern California	–	6,336 (0.32)/4,817
		Hawaiian	–	–	Hawaii	–	11,613 (0.43)/8,210
Rough-toothed dolphin	*Steno bredanensis*	not applicable[3]	–	–	Southern California	–	unk
		Hawaiian	–	–	Hawaii	–	72,528 (0.39)/52,833
Short-beaked common dolphin	*Delphinus delphis*	California, Oregon, and Washington	–	–	Southern California	–	969,861 (0.17)/839,325

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Table 3-1: Marine Mammals Occurrence within the HSTT Study Area (continued)

Common Name	Scientific Name	Stock	Status		Occurrence	Seasonal Absence	Stock Abundance (CV)/Minimum Population
			MMPA	ESA			
Short-finned pilot whale	*Globicephala macrorhynchus*	California, Oregon, & Washington	–	–	Southern California	–	836 (0.79)/466
		Hawaiian	–	–	Hawaii	–	19,503 (0.49)/13,197
Spinner dolphin	*Stenella longirostris*	Hawaii Pelagic	–	–	Hawaii	–	unk
		Hawaii Island	–	–	Hawaii	–	665* (0.09)/617
		Oahu and 4-Islands	–	–	Hawaii	–	unk
		Kauai and Niihau	–	–	Hawaii	–	unk
		Kure and Midway	–	–	Hawaii	–	unk
		Pearl and Hermes	–	–	Hawaii	–	unk
Striped dolphin	*Stenella coeruleoalba*	California, Oregon, and Washington	–	–	Southern California	–	29,211 (0.20)/24,782
		Hawaii Pelagic	–	–	Hawaii	–	61,021 (0.38)/44,922
Dall's porpoise	*Phocoenoides dalli*	California, Oregon, and Washington	–	–	Southern California	–	25,750 (0.45)/17,954
Harbor seal	*Phoca vitulina*	California	–	–	Southern California	–	30,968 na/27,348

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Table 3-1: Marine Mammals Occurrence within the HSTT Study Area (continued)

Common Name	Scientific Name	Stock	Status		Occurrence	Seasonal Absence	Stock Abundance (CV)/Minimum Population
			MMPA	ESA			
Hawaiian monk seal	*Neomonachus schauinslandi*	Hawaiian	Depleted	Endangered	Hawaii	–	1,415* (0.03)/1,384
Northern elephant seal	*Mirounga angustirostris*	California	–	–	Southern California	–	179,000 na/81,368
California sea lion	*Zalophus californianus*	U.S. Stock	–	–	Southern California	–	257,606* na/233,515
Guadalupe fur seal	*Arctocephalus townsendi*	Mexico to California	Depleted	Threatened	Southern California	–	20,000 na/15,830
Northern fur seal	*Callorhinus ursinus*	California	–	–	Southern California	–	14,050 na/7,524

* NMFS 2017 final stock assessment reports (Carretta et al., 2018a; Muto et al., 2018a) used for all stock abundances with exception for those abundances updated from NMFS' 2018 draft stock assessment reports shown with an * (Carretta et al., 2018b; Muto et al., 2018b)

[1]The two humpback whale Distinct Population Segments making up the California, Oregon, and Washington stock present in Southern California are the Mexico Distinct Population Segment, listed under ESA as Threatened, and the Central America Distinct Population Segment, which is listed under ESA as Endangered.

[2]This stock is mentioned briefly in the 2016 Pacific Stock Assessment Report (Carretta et al., 2017) and referred to as the "Eastern North Pacific Transient" stock, however, the Alaska Stock Assessment Report contains assessments of all transient killer whale stocks found in the Pacific Ocean, and the Alaska Stock Assessment Report refers to this same stock as the "West Coast Transient" stock (Muto et al., 2017).

[3]Rough-toothed dolphin has a range known to include the waters off Southern California, but there is no recognized stock or data available for the U.S West Coast.

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4 AFFECTED SPECIES STATUS AND DISTRIBUTION

NMFS annually publishes stock assessment reports for marine mammals in U.S. Exclusive Economic Zone waters, including stocks that occur within the HSTT Study Area. Information on the general biology and ecology of marine mammals species for which general regulations governing potential incidental takes are sought is included in the HSTT Final EIS/OEIS (U.S. Department of the Navy, 2018). Relevant information on their status, distribution, and seasonal distribution (when applicable), as well as additional information about the numbers of marine mammals likely to be found within the activity areas, has not changed beyond what was presented in the HSTT Final EIS/OEIS (U.S. Department of the Navy, 2018) and the U.S. Navy Marine Species Density Database Phase III for the Hawaii-Southern California Training and Testing Study Area (U.S. Department of the Navy, 2017), and is not discussed here.

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4.0 Affected Species Status and Distribution

5   TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED

As stated in the original LOA application, the Navy requested regulations and two LOAs for the taking of marine mammals incidental to proposed activities in the HSTT Study Area. Specifically, the Navy requested one LOA for training activities and one LOA for testing activities. The term "take," as defined in Section 3 (16 U.S.C. section 1362 (13)) of the MMPA, means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." "Harassment" was further defined in the 1994 amendments to the MMPA, which provided two levels of harassment: Level A (potential injury) and Level B (potential behavioral disturbance). For military readiness activities, the relevant definition of harassment is any act that

- injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild ("Level A harassment"); or
- disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behavioral patterns are abandoned or significantly altered ("Level B harassment") [16 U.S.C. section 1362(18) (B)(i) and (ii)].

Although the statutory definition of Level B harassment for military readiness activities requires that the natural behavior patterns of a marine mammal be significantly altered or abandoned, the current state of science for determining those thresholds is somewhat unsettled. Therefore, in its analysis of impacts associated with acoustic sources, the Navy has adopted a conservative approach that overestimates the number of takes by Level B harassment. Many of the responses estimated using the Navy's quantitative analysis are most likely to be of moderate severity. Moderate severity responses would be considered significant if they were sustained for a duration long enough that it caused an animal to be outside of normal daily variations in feeding, reproduction, resting, migration/movement, or social cohesion. As discussed in Section 6.4.1.6.1.1 (Criteria and Thresholds Used to Estimate Impacts from Sonar and Other Transducers – Behavioral Responses from Sonar and Other Transducers) of the original LOA application, the behavioral response functions used within the Navy's quantitative analysis were primarily derived from experiments using short-duration sound exposures lasting, in many cases, for less than 30 minutes. If animals exhibited moderate severity reactions for the duration of the exposure or longer, then it was conservatively assumed that the animal experienced a significant behavioral reaction. However, the experiments did not include measurements of costs to animals beyond the immediately observed reactions, and no direct correlations exist between an observed behavioral response and a cost that may result in long-term consequences. Within the Navy's quantitative analysis, many behavioral reactions are estimated from exposure to sound that may exceed an animal's behavioral threshold for only a single exposure to several minutes. It is likely that many of the estimated behavioral reactions within the Navy's quantitative analysis would not constitute significant behavioral reactions; however, the numbers of significant versus non-significant behavioral reactions are currently impossible to predict. Consequently, there is a high likelihood that a substantial number of marine mammals exposed to acoustic sources are not significantly altering or abandoning their natural behavior patterns. The overall impact of acoustic sources from military readiness activities on marine mammal species and stocks is

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negligible, i.e., cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stocks through effects on annual rates of recruitment or survival.

As noted previously in the original LOA application, the HSTT Final EIS/OEIS considered all training and testing activities proposed to occur in the HSTT Study Area that have the potential to result in the MMPA-defined take of marine mammals. The Navy determined that the following three stressors could result in the incidental taking of marine mammals:

Acoustic stressors (sonar and other transducers, air guns, pile driving/extraction)

Explosive stressors (in-water explosives)

Physical Disturbance and Strike stressors (vessel strike)

Acoustic sources have the potential to result in incidental takes of marine mammals by harassment or injury. Explosive sources have the potential to result in incidental takes of marine mammals by harassment, injury, or mortality. Vessel strikes have the potential to result in incidental take from direct injury and/or mortality.

The quantitative analysis process used for the HSTT Final EIS/OEIS, the original LOA application, and this LOA extension request to estimate potential exposures to marine mammals resulting from acoustic and explosive stressors is detailed in the technical report titled *Quantitative Analysis for Estimating Acoustic and Explosive Impacts to Marine Mammals and Sea Turtles* (U.S. Department of the Navy, 2017). For additional information on the quantitative analysis process and mitigation measures, refer to Chapter 6 (Take Estimates for Marine Mammals) and Chapter 11 (Mitigation Measures) in the original LOA application.

5.1 INCIDENTAL TAKE REQUEST FROM ACOUSTIC AND EXPLOSIVE SOURCES

A detailed analysis of effects to marine mammal due to exposures to acoustic and explosive sources in the HSTT Study Area from Navy training and testing activities is presented in Chapter 6 (Take Estimates for Marine Mammals) of the original LOA application. The annual and 5-year take request that was presented in the original LOA application will remain the same. The only difference in this take request is that two additional years have been added to the analysis; therefore, only the 7-year take request numbers are presented here. Based on the quantitative analysis described in Chapter 6 of the original LOA application, Table 5-1 summarizes the Navy's take request from acoustic and explosive sources for training and testing activities over a 7-year period. Table 5-2 and Table 5-3 in the following sections display the takes by species and stocks associated with all training and testing activities.

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Table 5-1: Summary of 7-Year Take Request from Acoustic and Explosive Sources for HSTT Training and Testing Activities

MMPA Category	Source	7-Year Authorization Sought	
		Training Activities[1]	Testing Activities[2]
Mortality	Explosive	9	4
Level A	Acoustic & Explosive	3,162	1,614
Level B	Acoustic & Explosive	10,779,332	7,189,051

[1] Take estimates for acoustic and explosive sources for training activities are based on the maximum number of activities in a 12-month period. Species-specific information shown in Table 5-2.
[2] Take estimates for acoustic and explosive sources for testing activities are based on the maximum number of activities in a 12-month period. Species-specific information shown in Table 5-3.

5.1.1 INCIDENTAL TAKE REQUEST FROM ACOUSTIC AND EXPLOSIVE SOURCES FOR TRAINING ACTIVITIES

Table 5-2 summarizes the Navy's take request (exposures that may lead to Level A and Level B harassment) for training activities by species and stock over a 7-year period based on acoustic and explosive effects modeling.

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**Table 5-2: 7-Year Total Species-Specific Take Requests from Modeling Estimates of Acoustic
and Explosive Sound Source Effects for All Training Activities**

Species	Stock	7-Year Total**	
		Level B	Level A
Blue whale*	Central North Pacific	205	0
	Eastern North Pacific	7,116	6
Bryde's whale[†]	Eastern Tropical Pacific	167	0
	Hawaiian[†]	631	0
Fin whale*	California, Oregon, & Washington	7,731	0
	Hawaiian	197	0
Humpback whale[†]	California, Oregon, & Washington[†]	7,962	7
	Central North Pacific	34,437	12
Minke whale	California, Oregon, & Washington	4,119	7
	Hawaiian	20,237	6
Sei whale*	Eastern North Pacific	333	0
	Hawaiian	677	0
Gray whale[†]	Eastern North Pacific	16,703	27
	Western North Pacific[†]	19	0
Sperm whale*	California, Oregon, & Washington	8,834	0
	Hawaiian	10,341	0
Dwarf sperm whale	Hawaiian	84,232	215
Pygmy sperm whale	Hawaiian	33,431	94
Kogia whales	California, Oregon, & Washington	38,609	149
Baird's beaked whale	California, Oregon, & Washington	8,524	0
Blainville's beaked whale	Hawaiian	23,491	0
Cuvier's beaked whale	California, Oregon, & Washington	47,178	0
	Hawaiian	7,898	0
Longman's beaked whale	Hawaiian	82,293	0
Mesoplodon spp (beaked whale guild)	California, Oregon, & Washington	25,404	0

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Table 5-2: 7-Year Total Species-Specific Take Requests from Modeling Estimates of Acoustic and Explosive Sound Source Effects for All Training Activities (continued)

Species	Stock	7-Year Total	
		Level B	Level A
Bottlenose dolphin	California Coastal	1,295	0
	California, Oregon, & Washington Offshore	201,619	13
	Hawaiian Pelagic	13,080	0
	Kauai & Niihau	500	0
	Oahu	57,288	10
	4-Island	1,052	0
	Hawaii	291	0
False killer whale[†]	Hawaii Pelagic	4,353	0
	Main Hawaiian Islands Insular[†]	2,710	0
	Northwestern Hawaiian Islands	1,585	0
Fraser's dolphin	Hawaiian	177,198	4
Killer whale	Eastern North Pacific Offshore	460	0
	Eastern North Pacific Transient/West Coast Transient	855	0
	Hawaiian	513	0
Long-beaked common dolphin	California	784,965	99
Melon-headed whale	Hawaiian Islands	14,137	0
	Kohala Resident	1,278	0
Northern right whale dolphin	California, Oregon, & Washington	357,001	57
Pacific white-sided dolphin	California, Oregon, & Washington	274,892	19
Pantropical spotted dolphin	Hawaii Island	17,739	0
	Hawaii Pelagic	42,318	0
	Oahu	28,860	0
	4-Island	1,816	0
Pygmy killer whale	Hawaiian	35,531	0
	Tropical	2,977	0
Risso's dolphin	California, Oregon, & Washington	477,389	45
	Hawaiian	40,800	0

Table 5-2: 7-Year Total Species-Specific Take Requests from Modeling Estimates of Acoustic and Explosive Sound Source Effects for All Training Activities (continued)

Species	*Stock*	*7-Year Total*	
		Level B	*Level A*
Rough-toothed dolphin	Hawaiian	26,769	0
	NSD[1]	0	0
Short-beaked common dolphin	California, Oregon, & Washington	5,875,431	307
Short-finned pilot whale	California, Oregon, & Washington	6,341	6
	Hawaiian	53,627	0
Spinner dolphin	Hawaii Island	609	0
	Hawaii Pelagic	18,870	0
	Kauai & Niihau	1,961	0
	Oahu & 4-Island	10,424	8
Striped dolphin	California, Oregon, & Washington	777,001	5
	Hawaiian	32,806	0
Dall's porpoise	California, Oregon, & Washington	171,250	894
California sea lion	U.S.	460,145	629
Guadalupe fur seal*	Mexico	3,342	0
Northern fur seal	California	62,138	0
Harbor seal	California	19,214	48
Hawaiian monk seal*	Hawaiian	938	5
Northern elephant seal	California	241,277	490

* ESA-listed species (all stocks) within the HSTT Study Area

**7-year total impacts may be less than sum total of each year. Not all activities occur every year; some activities occur multiple times within a year; and some activities only occur a few times over course of a 7-year period.

†Only designated stocks are ESA-listed

[1]NSD: No stock designation

5.1.2 INCIDENTAL TAKE REQUEST FROM ACOUSTIC AND EXPLOSIVE SOURCES FOR TESTING ACTIVITIES

Table 5-3 summarizes the Navy's take request (exposures that may lead to Level A and Level B harassment) for testing activities by species and stock over a 7-year period based on acoustic and explosive effects modeling.

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**Table 5-3: 7-Year Total Species-Specific Take Requests from Modeling Estimates of Acoustic
and Explosive Sound Source Effects for All Testing Activities**

Species	Stock	7-Year Total**	
		Level B	Level A
Blue whale*	Central North Pacific	93	0
	Eastern North Pacific	5,679	0
Bryde's whale[†]	Eastern Tropical Pacific	97	0
	Hawaiian[†]	278	0
Fin whale*	California, Oregon, & Washington	6,662	7
	Hawaiian	108	0
Humpback whale[†]	California, Oregon, & Washington[†]	4,961	0
	Central North Pacific	23,750	19
Minke whale	California, Oregon, & Washington	1,855	0
	Hawaiian	9,822	7
Sei whale*	Eastern North Pacific	178	0
	Hawaiian	329	0
Gray whale[†]	Eastern North Pacific	13,077	9
	Western North Pacific[†]	15	0
Sperm whale*	California, Oregon, & Washington	7,409	0
	Hawaiian	5,269	0
Dwarf sperm whale	Hawaiian	43,374	197
Pygmy sperm whale	Hawaiian	17,396	83
Kogia whales	California, Oregon, & Washington	20,766	94
Baird's beaked whale	California, Oregon, & Washington	4,841	0
Blainville's beaked whale	Hawaiian	11,455	0
Cuvier's beaked whale	California, Oregon, & Washington	30,180	28
	Hawaiian	3,784	0
Longman's beaked whale	Hawaiian	41,965	0
Mesoplodon spp (beaked whale guild)	California, Oregon, & Washington	16,383	15

Table 5-3: 7-Year Total Species-Specific Take Requests from Modeling Estimates of Acoustic and Explosive Sound Source Effects for All Testing Activities (continued)

Species	Stock	7-Year Total	
		Level B	Level A
Bottlenose dolphin	California Coastal	11,158	0
	California, Oregon, & Washington Offshore	158,700	8
	Hawaiian Pelagic	8,469	0
	Kauai & Niihau	3,091	0
	Oahu	3,230	0
	4-Island	1,129	0
	Hawaii	260	0
False killer whale[†]	Hawaii Pelagic	2,287	0
	Main Hawaiian Islands Insular[†]	1,256	0
	Northwestern Hawaiian Islands	837	0
Fraser's dolphin	Hawaiian	85,193	9
Killer whale	Eastern North Pacific Offshore	236	0
	Eastern North Pacific Transient/West Coast Transient	438	0
	Hawaiian	279	0
Long-beaked common dolphin	California	805,063	34
Melon-headed whale	Hawaiian Islands	7,678	0
	Kohala Resident	1,119	0
Northern right whale dolphin	California, Oregon, & Washington	280,066	22
Pacific white-sided dolphin	California, Oregon, & Washington	213,380	14
Pantropical spotted dolphin	Hawaii Island	9,568	0
	Hawaii Pelagic	24,805	0
	Oahu	1,349	0
	4-Island	2,513	0
Pygmy killer whale	Hawaiian	18,347	0
	Tropical	1,928	0
Risso's dolphin	California, Oregon, & Washington	339,334	24
	Hawaiian	19,027	0

Table 5-3: 7-Year Total Species-Specific Take Requests from Modeling Estimates of Acoustic and Explosive Sound Source Effects for All Testing Activities (continued)

Species	*Stock*	*7-Year Total*	
		Level B	*Level A*
Rough-toothed dolphin	Hawaiian	14,851	0
	NSD[1]	0	0
Short-beaked common dolphin	California, Oregon, & Washington	3,795,732	304
Short-finned pilot whale	California, Oregon, & Washington	6,253	0
	Hawaiian	29,269	0
Spinner dolphin	Hawaii Island	1,394	0
	Hawaii Pelagic	9,534	0
	Kauai & Niihau	9,277	0
	Oahu & 4-Island	1,987	0
Striped dolphin	California, Oregon, & Washington	371,328	20
	Hawaiian	16,270	0
Dall's porpoise	California, Oregon, & Washington	115,353	478
California sea lion	U.S.	334,332	36
Guadalupe fur seal*	Mexico	6,167	0
Northern fur seal	California	36,921	7
Harbor seal	California	15,898	12
Hawaiian monk seal*	Hawaiian	372	0
Northern elephant seal	California	151,754	187

* ESA-listed species (all stocks) within the HSTT Study Area
**7-year total impacts may be less than sum total of each year. Not all activities occur every year; some activities occur multiple times within a year; and some activities only occur a few times over course of a 7-year period.
†Only designated stocks are ESA-listed
[1]NSD: No stock designation

5.2 INCIDENTAL TAKE REQUEST FROM VESSEL STRIKES

Vessel strike to marine mammals is not associated with any specific training or testing activity but rather a limited, sporadic, and incidental potential result of Navy vessel movement within the HSTT Study Area. Based on the probabilities of whale strikes suggested by an analysis of past strike data and anticipated future vessel movements provided in Section 6.6 (Estimated Take of Marine Mammals by Vessel Strike) of the original LOA application, the Navy did not anticipate vessel strikes to marine mammals within the HSTT Study Area during training and testing activities; however, the Navy did request takes from vessel strikes as a cautionary acknowledgment that some probability of ship strike, although low, does exist. An additional two years of training and testing activities would not change any of the comprehensive qualitative assessments Navy did with NMFS as part of the consultation process and, therefore, no changes are requested for ship strike takes.

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6 TAKE ESTIMATES FOR MARINE MAMMALS

6.1 ESTIMATED TAKE OF MARINE MAMMALS BY ACOUSTIC AND EXPLOSIVE SOURCES

A detailed analysis of effects due to marine mammal exposures to acoustic and explosive stressors in the HSTT Study Area from Navy training and testing activities was presented in Chapter 6 (Take Estimates for Marine Mammals) of the original LOA application. The annual and 5-year take request that was presented in the original LOA application remain the same. The only difference in this take request is that two additional years have been requested for the activity, making the full LOA extension request valid for seven years. Annual rates of take are the same and, as concluded in the original LOA application, population consequences are not anticipated for any marine mammal species due to an additional two years of the Navy's training and testing activities.

6.1.1 NEW PERTINENT MARINE MAMMAL SCIENCE SINCE OCTOBER 2017

The scientific community continues to conduct research to generate new data in an effort to expand and improve our understanding of the marine environment. The Navy is a strong advocate for and sponsor of marine research and is vigilant in its review of new information that may inform the analyses or affect the conclusions. The Navy has identified additional references, many of them published within the last year, that are relevant to the analysis in the original LOA application. The majority of these references are peer-reviewed journal articles and present the results of ongoing and new research on the effects of vessel noise, impulsive noise, construction noise, and sonar on marine mammals; disturbance models for marine mammals; auditory impacts to marine mammals; and behavioral responses of fish species, as well as other topics. Overall, these new references do not change the impacts analysis or conclusions discussed in the original LOA application. The Navy will continue to monitor and review the results of new research and evaluate how those results apply to the Navy's assessment of marine resources. Due to their relevance to the analysis of the activity, however, several of these studies are described below.

Nachtigall et al. (2018) and Finneran (2018) describe the measurements of hearing sensitivity of multiple odontocete species (bottlenose dolphin, harbor porpoise, beluga, and false killer whale) when a relatively loud sound was preceded by a warning sound. These captive animals were shown to reduce hearing sensitivity when warned of an impending intense sound. Based on these experimental observations of captive animals, the authors suggest that wild animals may dampen their hearing during prolonged exposures or if conditioned to anticipate intense sounds. Finneran recommends further investigation of the mechanisms of hearing sensitivity reduction in order to understand the implications for interpretation of some existing TTS data obtained from captive animals, notably for considering TTS due to short duration, unpredictable exposures. No modification of analysis of auditory impacts is currently suggested, as the current auditory impact thresholds are based on best available data for both impulsive and non-impulsive exposures to marine mammals.

Several publications described models developed to examine the long-term effects of environmental or anthropogenic disturbance of foraging on various life stages of selected species (sperm whale – Farmer et al. (2018), California sea lions – McHuron et al. (2018), and blue whale – Pirotta, et al. (2018)). These models, taken into consideration with similar models described in the HSTT Final EIS/OEIS, will continue to add to refinement of approaches to the population consequences of disturbance framework. Such models also help identify what data inputs require further investigation. The Navy will continue to

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support long-term monitoring efforts and data gathering on Navy ranges and subsequently continue to assess the applicability of population consequences models to its analysis.

Bernaldo de Quirós et al. (2019) summarized discussions from a 2017 workshop on potential sonar impacts to beaked whales. However, the effects described in the paper have been discussed previously in the 2018 HSTT EIS/OEIS. Furthermore, many of the focus areas for beaked whale research recommended in the paper are already ongoing and planned for continuation through 2025 under Navy funding within the HSTT Study Area. Additionally, Kastelein et al. (2018) exposed two captive harbor porpoises to mid-frequency sonar (which was a scaled version that was meant to mimic the U.S. Navy's most powerful and common sonar source) to investigate reactions at varying duty cycles. Harbor porpoises did not respond to the low-duty cycle mid-frequency tones at any received level, but one did respond to the high-duty cycle signal with more jumping and increased respiration rates (Kastelein et al., 2018). The analysis also indicated that there was no habituation or sensitization across the exposure periods. These received levels are similar to previous levels at which harbor porpoises have responded to sonar; however, the analysis suggest that further research is required to determine the effect of duty cycle on the context of behavioral responses and whether behavioral response to duty cycles associated with Navy sonar use are less likely to occur than was previously thought. This information does not change the current analysis and conclusions.

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7 ANTICIPATED IMPACT OF THE ACTIVITY

As stated in the original LOA application, consideration of "negligible impact" to the species or stock is required for NMFS to authorize incidental take of marine mammals. By definition, an activity has a "negligible impact" on a species or stock when the activity cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

In the original LOA application, the Navy concluded that the proposed training and testing activities in the HSTT study area would result in Level A, Level B, or mortality takes, as summarized in Section 5.1 (Incidental Take Request from Acoustic and Explosive Sources) and Section 5.2 (Incidental Take Request from Vessel Strikes). Also, as discussed in the original LOA application, all conclusions were based on annual metrics such as rates of recruitment and survival. Therefore, the addition of two years to the permit, resulting in a 7-year permit, does not change the annual analysis that was previously conducted and, therefore, the annual activity and take numbers remain consistent. Based on best available science, the Navy concluded that exposures of marine mammal species and stocks to the proposed training and testing activities would result in only short-term effects on most individuals exposed and would not affect annual rates of recruitment or survival for species and stocks for the following reasons:

- Most acoustic exposures were within the non-injurious TTS or behavioral effects zones (Level B harassment).

- Although the numbers presented in Section 6.6 (Estimated Take of Marine Mammals by Vessel Strike) of the original LOA application represented estimated harassment takes under the MMPA, they were conservative (i.e., over-predictions) estimates of harassment, primarily by behavioral disturbance.

- The mitigation measures described in Chapter 11 (Mitigation Measures) of this LOA extension request are designed to avoid or reduce the potential for injury from acoustic, explosive, and physical disturbance stressors to the maximum extent practicable. The quantitative analysis process estimates harassment, taking into consideration mitigation measures.

- Range complexes and testing ranges where intensive training and testing have been occurring for decades have populations of multiple species with strong site fidelity (including resident beaked whales at some locations) and increases in the number of some species.

The original LOA application assumed that short-term non-injurious sound exposure levels predicted to cause onset-TTS or temporary behavioral disruptions (non-TTS) qualify as Level B harassment. This assumption overestimated reactions qualifying as harassment under MMPA because there is no established scientific correlation between short-term use of sonar and other transducers, explosives, and pile driving/extraction, and air guns, and long-term abandonment or significant alteration of behavioral patterns in marine mammals.

An analysis of the potential impacts of the proposed activities on recruitment or survival was presented in Chapter 6 (Take Estimates for Marine Mammals) of the original LOA application for each individual species, species group, or stock based on life history information, estimated take levels, an analysis of estimated take levels in comparison to the overall population, and identified geographic areas that may be particularly important for activities such as feeding and breeding. The species-specific analyses, in

combination with the mitigation measures provided in Chapter 11 (Mitigation Measures) support the conclusion that proposed training and testing activities would have a negligible impact on marine mammal species or stocks within the Study Area. The analysis of impacts presented in the original LOA application were analyzed based on the annual levels of training and testing activities. This request only adds two years to the current LOAs (making them applicable for a total of seven years as opposed to the original five years), and no changes would occur in the annual levels of training and testing. As discussed above, there has been no change to the information, analysis, and conclusions presented in the original LOA application. Therefore, impacts are not discussed further here.

8   ANTICIPATED IMPACTS ON SUBSISTENCE USES

Potential marine mammal impacts resulting from training and testing activities in the Hawaii-Southern California Training and Testing Study Area will be limited to individuals located in the Study Area and where no subsistence requirements exist. Therefore, no impacts on the availability of species or stocks for subsistence use are considered in this LOA extension request.

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9 ANTICIPATED IMPACTS ON HABITAT

As stated in the original LOA application, impacts on marine mammal habitat as a result of the training and testing activities could include (1) changes in water quality, (2) the introduction of sound into the water column, and (3) temporary changes to prey distribution and abundance. Each of these issues was considered in the HSTT EIS/OEIS and training and testing activities were determined to have no impact on marine mammal habitat. An additional two years of permitted activity would not change the basis for these conclusions and, therefore, impacts to habitat are not discussed further here.

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10 ANTICIPATED EFFECTS OF HABITAT IMPACTS ON MARINE MAMMALS

As stated in the original LOA application, the activity is not expected to have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations. There will be no impacts on marine mammals resulting from loss or modification of marine mammal habitat. Therefore, it is expected there will continue to be no impacts on marine mammals resulting from loss or modification of marine mammal habitat from the additional two years of the training and testing activities associated with this LOA extension.

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11 MITIGATION MEASURES

As stated in the original LOA application, the Navy implements mitigation measures to avoid or reduce potential impacts from acoustic, explosive, and physical disturbance and strike stressors. The Navy's mitigation measures are organized into two categories: procedural mitigation and geographic mitigation. A complete discussion of the evaluation process used to develop, assess, and select mitigation measures can be found in Chapter 5 (Mitigation) of the HSTT Final EIS/OEIS, and the final suite of mitigation, monitoring, and reporting requirements is described in the Final Rule (83 FR 66846). In requesting an additional two years of authorized activity, no changes are being proposed to the suite of mitigation measures that was developed in consultation with NMFS and is currently being implemented. The same mitigation measures would continue to be implemented.

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12 ARCTIC PLAN OF COOPERATION

Subsistence use is the traditional exploitation of marine mammals by native peoples (i.e., for their own consumption). None of the proposed training or testing activities in the Study Area occurs in or near the Arctic. Given the additional two years of activity requested, there continue to be no anticipated impacts on any species or stocks migrating through the Study Area that might be available for subsistence use.

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13 MONITORING AND REPORTING

As stated in the original LOA application, the Navy is committed to demonstrating environmental stewardship while executing its national defense mission and complying with the suite of federal environmental laws and regulations. As a complement to the Navy's commitment to avoiding and reducing impacts of training and testing activities through mitigation (Chapter 11, Mitigation Measures), the Navy will undertake reporting efforts to track compliance with take authorizations and help investigate the effectiveness of implemented mitigation measures. Taken together, mitigation and monitoring comprise the Navy's integrated approach for reducing and understanding environmental impacts from the activity. The Navy's overall monitoring approach will seek to leverage and build on existing research efforts whenever possible.

As outlined in the original LOA application, the Navy's monitoring and reporting will consist of (1) adaptive management, (2) an Integrated Comprehensive Monitoring Program, (3) a strategic planning process, and (4) annual monitoring and exercise and testing reports. The monitoring and reporting requirements annotated in the December 27, 2018 Final Rule (83 FR 66846) will remain the same for this LOA extension request.

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13.0 Monitoring and Reporting

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14 SUGGESTED MEANS OF COORDINATION

As stated in the original LOA application, the Navy provides a significant amount of funding and support to marine research. Over the past five years. the U.S. Navy has provided over $100 million to universities, research institutions, federal laboratories, private companies, and independent researchers around the world to study marine mammals, including approximately 70 percent of all U.S. research concerning the effects of human-generated sound on marine mammals and 50 percent of such research conducted worldwide. This research is directly applicable to the HSTT activities analysis, particularly with respect to the investigations of the potential impacts of underwater noise sources on marine mammals and other protected marine resources.

Overall, the U.S. Navy will continue to support and fund ongoing marine mammal research and long-term monitoring programs throughout the HSTT Study Area as discussed in the December 27, 2018 Final Rule (83 FR 66846).

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14.0 Suggested Means of Coordination

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