



ANNUAL REPORT NUMBER 3

UNDER THE NATIONAL MARINE FISHERIES SERVICE
15 AUGUST 2014 LETTERS OF AUTHORIZATION AND
2012 FINAL RULE—TAKING MARINE MAMMALS INCIDENTAL
TO U.S. SURVEILLANCE TOWED ARRAY SENSOR SYSTEM
LOW FREQUENCY ACTIVE (SURTASS LFA) SONAR ONBOARD
USNS VICTORIOUS (T-AGOS 19), USNS ABLE (T-AGOS 20),
USNS EFFECTIVE (T-AGOS 21), AND USNS IMPECCABLE (T-
AGOS 23)



DEPARTMENT OF THE NAVY
CHIEF OF NAVAL OPERATIONS

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LIST OF ACRONYMS AND ABBREVIATIONS

μ	micro
%	percent or percentage
BO	Biological Opinion
CFR	Code of Federal Regulations
CLFA	Compact Low Frequency Active
CNO	Chief of Naval Operations
CNP	Central North Pacific
dB	decibel(s)
dB re 1 μPa @ 1 m	decibel(s) relative to one microPascal at one meter from center of acoustic source
DoN	Department of the Navy
EIS	Environmental Impact Statement
EO	Executive Order
EOG	Executive Oversight Group
ESA	Endangered Species Act
ft	foot/feet
HF	high frequency
HF/M3	High Frequency Marine Mammal Monitoring (sonar)
hr	hour(s)
Hz	Hertz
IA	Inshore Archipelago
ITS	Incidental take statement
km	kilometer(s)
LF	low frequency
LFA	Low Frequency Active
LOA	Letter of Authorization
m	meter(s)
M3	Marine Mammal Monitoring (program)
MAI	Marine Acoustics, Inc.
MILCREW	Military Crew
min	minute(s)
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Policy Act
nmi	nautical mile(s)
NMFS	National Marine Fisheries Service
NMS	National Marine Sanctuary
NOAA	National Oceanic and Atmospheric Administration

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NP	North Pacific
OBIA	Offshore Biologically Important Area
OEIS	Overseas Environmental Impact Statement
OIC	Officer in Charge
Pa	Pascal
RL	received level
rms	root mean square
SAG	Scientific Advisory Group
sec	second(s)
SEIS/SOEIS	Supplemental Environmental Impact Statement/Supplemental Overseas Environmental Impact Statement
SEL	sound exposure level
SL	source level
SPE	single ping equivalent
SPL	sound pressure level
SURTASS	Surveillance Towed Array Sensor System
T-AGOS	Tactical Auxiliary General Ocean Surveillance (vessel)
U.S.	United States of America
U.S.C.	United States Code
USNS	United States Naval Ship
WNP	Western North Pacific

1 PURPOSE

As a requirement of the Marine Mammal Protection Act (MMPA) Final Rule (50 CFR 218 Subpart X) and the annual Letters of Authorization (NOAA, 2014) for Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar that specify the regulations governing the taking of marine mammals incidental to Navy operation of SURTASS LFA sonar systems¹, this annual report provides an unclassified summary of SURTASS LFA sonar operations onboard the United States Naval Ship (USNS) VICTORIOUS (Tactical Auxiliary General Ocean Surveillance [T-AGOS] 19) (Figure 1), USNS ABLE (T-AGOS 20), USNS EFFECTIVE (T-AGOS 21), and USNS IMPECCABLE (T-AGOS 23) for the annual effective period 15 August 2014 through 14 August 2015. This annual report has been prepared in accordance with the requirements of the MMPA Final Rule 50 CFR § 218.236(b) (NOAA, 2012) and Condition 13(f) of the annual Letters of Authorization (LOAs) for SURTASS LFA sonar issued by the National Marine Fisheries Service (NMFS) (Appendix A) (NOAA, 2014).



Figure 1. SURTASS LFA sonar vessel, USNS VICTORIOUS (T-AGOS 19).

The primary purpose of this annual report is to provide NMFS with an unclassified summary of the SURTASS LFA sonar operations over the annual effective period and synopsise the quarterly mission reports. This annual report also includes estimates of the marine mammal stocks affected by SURTASS LFA sonar operations from all vessels, an analysis of the effectiveness of mitigation measures, an assessment of any long-term effects on marine mammals, and any discernible or estimated cumulative effects on marine mammals. This report also provides NMFS with information necessary to demonstrate conformance to the Terms and Conditions (Paragraph 8.3) of the Biological Opinion under the Endangered Species Act (ESA) on the issuance of the LOAs (NMFS, 2014).

A detailed description of the passive (SURTASS) and active (LFA) components and operating characteristics of the SURTASS LFA sonar system may be found in the 2012 to 2013 Annual Report No.

1 In this annual report, "SURTASS LFA sonar systems" refers to both the LFA and compact LFA (CLFA) systems, each having similar acoustic transmission characteristics.

1 (DoN, 2013) or the 2012 Supplemental Environmental Impact Statement/Overseas Supplemental Environmental Impact Statement (SEIS/SOEIS) for SURTASS LFA sonar (DoN, 2012).

2 REGULATORY COMPLIANCE FOR 2012 THROUGH 2017

In 2011, NMFS received an application from the Navy requesting five-year regulations and annual LOAs to take marine mammals by harassment incidental to conducting SURTASS LFA sonar operations in the world's oceans, with certain exceptions, from August 2012 through August 2017. These operations, which constitute a military readiness activity, have the potential to cause behavioral disturbance and injury (if not mitigated) to marine mammals. Section 101(a)(5)(A) of the MMPA, and implementing regulations at 50 CFR part 216, subpart I, provide the legal basis for NMFS issuing the five-year regulations and annual LOAs for the employment of SURTASS LFA sonar.

On 8 June 2012, the Navy released a Final SEIS/SOEIS for employment of SURTASS LFA sonar (DoN, 2012). NMFS was a cooperating agency on the FSEIS/SOEIS under the Council on Environmental Quality's regulations implementing the National Environmental Policy Act (NEPA) of 1972. The Record of Decision for the Navy's FSEIS/SOEIS was signed 15 August 2012. Shortly thereafter on 20 August 2012, NMFS issued the third set of regulations under the MMPA to govern the unintentional taking of marine mammals incidental to employment of SURTASS LFA sonar during routine training, testing, and military operations on a maximum of four ocean surveillance ships in areas of the Pacific, Atlantic, and Indian Oceans and the Mediterranean Sea, from the period of 15 August 2012 through 14 August 2017 (NOAA, 2012). These regulations authorized NMFS to issue annual LOAs for the incidental take of marine mammals associated with the employment of SURTASS LFA sonar; set forth the permissible methods of taking; set forth other means of effecting the least practicable adverse impact on marine mammal species and their habitat; and set forth requirements pertaining to the monitoring and reporting.

In January 2015, pursuant to an order issued by the United States (U.S.) District Court for the Northern District of California on May 22, 2014, the Navy with NMFS as a cooperating agency, prepared an additional Final SEIS/SOEIS (DoN, 2015) for the limited purpose of remedying a deficiency under the NEPA in the 2012 Final SEIS/SOEIS (DoN, 2012). The Court found the NEPA analysis in the Navy's 2012 FSEIS/SOEIS deficient because the Navy failed to use the best available data when it determined potential impacts from employment of SURTASS LFA sonar systems on one stock of common bottlenose dolphins in Hawaiian waters rather than the more updated information indicating five stocks of common bottlenose dolphins occur in Hawaiian waters². A supplemental Record of Decision for the Navy's limited purpose FSEIS/SOEIS was published on April 2, 2015 (DoD, 2015).

2.1 CURRENT REGULATIONS

Under the NMFS 2012 MMPA Final Rule (50 CFR Part 218, Subpart X), the Navy is authorized to conduct routine SURTASS LFA sonar training, testing, and military operations in the oceanic areas of the Pacific, Atlantic, and Indian Oceans, and the Mediterranean Sea with the exception of certain geographic areas, such as polar waters. Additionally, employment of SURTASS LFA sonar is limited in additional geographic areas including the coastal standoff range, offshore biologically important areas (OBIA), and known human diver locations, wherein the sound field generated by LFA sonar cannot exceed specific received levels. SURTASS LFA sonar transmissions will not exceed 180 decibels relative to 1 microPascal (root mean square) (dB re 1 μ Pa [rms]) within 22 kilometers (km) (12 nautical miles [nmi]) of all land masses with a coastline (regardless of size and including islands) (i.e., coastal standoff range) or within 1 km of the outer perimeter of any OBIA (LOA Condition 8h(i and ii)). The received sound field at human dive sites cannot exceed 145 dB re 1 μ Pa (rms).

2 The Navy failed to use the stock delineations and stock abundances for the common bottlenose dolphin in Hawaiian waters from the 2010 Stock Assessment Report (Carretta et al., 2011).

References to Underwater Sound Levels

- References to underwater sound pressure level (SPL) in this document are values given in decibels (dBs) and are assumed to be standardized at 1 microPascal at 1 m (dB re 1 μ Pa @ 1 m [rms]) for source level (SL) and dB re 1 μ Pa (rms) for received level (RL), unless otherwise stated (Urick, 1983; ANSI, 2006).
- Single ping equivalent (SPE) is an intermediate calculation for input to the risk continuum based impact analyses in this document. SPE accounts for the energy of all the LFA acoustic transmissions that a modeled animal receives during an entire LFA mission (7 days for pre-mission analyses and the actual duration of LFA sonar transmissions for post-mission analyses). SPE is a function of SPL, not SEL. SPE levels will be expressed as “dB SPE” in this document. Calculating the potential risk from SURTASS LFA sonar is a complex process; see Appendix C of the 2012 SEIS/SOEIS (DoN, 2012) for details.

Twenty-two marine mammal OBIAs for SURTASS LFA sonar have been designated globally (Table 1) (NOAA, 2012). The only OBIA for SURTASS LFA sonar that is within a mission area requested for 2014 through 2015 employment of SURTASS LFA sonar is the Hawaiian Islands Humpback Whale National Marine Sanctuary (NMS) and Penguin Bank OBIA (OBIA 16), wherein the SURTASS LFA sound field cannot exceed 180 dB re 1 μ Pa (rms) from November through April, annually (Table 1). During military operations, however, SURTASS LFA sonar transmissions may exceed 180 dB re 1 μ Pa (rms) within the boundaries of SURTASS LFA sonar OBIAs when: 1) operationally necessary to continue tracking an existing underwater contact; or 2) operationally necessary to detect a new underwater contact within the OBIA (50 CFR 218.234(g)(1) and LOA Condition 8[i]). This exception does not apply to routine training and testing with SURTASS LFA sonar systems.

Under the 2012 MMPA Final Rule, NMFS issued the Navy four LOAs (Appendix A) valid from the annual period 15 August 2014 to 15 August 2015 for the employment of SURTASS LFA sonar aboard the USNS VICTORIOUS, USNS ABLE, USNS EFFECTIVE, and USNS IMPECCABLE. The LOAs authorized a total of 432 hours of LFA sonar transmissions per vessel over the annual LOA period for employment in 11 mission areas located in the northwest and north-central Pacific Ocean: east of Japan, North Philippine Sea, west Philippine Sea, offshore Guam, Sea of Japan, East China Sea, South China Sea, offshore Japan (10° to 25°N and 25° to 40°N), Hawaii North, and Hawaii South. An estimated 20 nominal active sonar missions (16 missions in the northwestern Pacific Ocean and four missions in the Hawaii mission areas) (or equivalent shorter missions) are authorized for all four SURTASS LFA sonar vessels over the annual period. SURTASS LFA sonar vessels can only transmit LFA sonar signals that are between 100 and 500 Hertz (Hz), with a source level (SL) for each of the 18 projectors of no more than 215 dB re 1 μ Pa at 1 meter (rms) (dB re 1 μ Pa @ 1 m [rms]), and a maximum duty cycle of 20 percent (%) (LOA Condition 3). Additionally, takes by MMPA Level B harassment will not exceed 12% of any marine mammal stock for all vessels combined during the annual period.

3 MITIGATION MEASURES AND MITIGATION MONITORING REQUIREMENTS

Mitigation protocols, operational restrictions, and mitigation monitoring requirements under which the Navy may operate SURTASS LFA sonar were set forth in the 2012 Record of Decision (DoD, 2012), MMPA Final Rule (NOAA, 2012), and in the annual LOAs (Appendix A). The Chief of Naval Operations, Intelligence, Surveillance, and Reconnaissance Capabilities Division (N2/N6F24) promulgated these protocols, restrictions, and requirements to the Navy Fleet commands via Executive Direction messages on 15 August 2014.

Table 1. SURTASS LFA OBIAs for marine mammals and their period of effectiveness.

OBIA NUMBER	OBIA	PERIOD OF EFFECTIVENESS
1	Georges Bank	Year-round
2	Roseway Basin Right Whale Conservation Area	June through December, annually
3	Great South Channel, U.S. Gulf of Maine, and Stellwagen Bank NMS	January 1 to November 14, annually
4	Southeastern U.S. Right Whale Seasonal Habitat	November 15 to April 15, annually
5	North Pacific Right Whale Critical Habitat	March through August, annually
6	Silver Bank and Navidad Bank	December through April, annually
7	Coastal waters of Gabon, Congo and Equatorial Guinea	June through October, annually
8	Patagonian Shelf Break	Year-round
9	Southern Right Whale Seasonal Habitat	May through December, annually
10	Central California National Marine Sanctuaries	June through November, annually
11	Antarctic Convergence	October through March, annually
12	Piltun and Chayvo Offshore Feeding Grounds in the Sea of Okhotsk	June through November, annually
13	Coastal waters off Madagascar	July through September, annually for humpback whale breeding and November through December, annually for migrating blue whales
14	Madagascar Plateau, Madagascar Ridge, and Walters Shoal	November through December, annually
15	Ligurian-Corsican-Provencal Basin and Western Pelagos Sanctuary in the Mediterranean Sea	July to August, annually
16	Hawaiian Islands Humpback Whale NMS and Penguin Bank	November through April, annually
17	Costa Rica Dome	Year-round
18	Great Barrier Reef between 16° S and 21° S	May through September, annually
19	Bonney Upwelling off the southern coast of Australia	December through May, annually
20	Northern Bay of Bengal and Head of Swatch-of-No-Ground	Year-round
21	Olympic Coast NMS, The Prairie, Barkley Canyon, and Nitnat Canyon	Olympic NMS: December, January, March, and May, annually The Prairie, Barkley Canyon, and Nitnat Canyon: June through September, annually
22	Abrolhos Bank	August through November, annually

The goal of the mitigation measures and mitigation monitoring required for the employment of SURTASS LFA sonar are to minimize, to the greatest extent practicable, adverse impacts on marine mammal species or stocks and their habitat. These objectives are met through geographical restrictions on LFA sonar employment, maintenance of a mitigation and buffer zone around the transmitting LFA sonar source, ramp-up procedures for the high frequency/marine mammal monitoring (HF/M3) sonar system, suspension or delay of LFA sonar transmissions when marine mammals are detected in the mitigation or buffer zones, and mission planning. Mitigation measures and mitigation monitoring include visual (daylight hours only), passive acoustic, and active acoustic monitoring whenever LFA sonar is transmitting.

3.1 GEOGRAPHIC RESTRICTIONS

As previously noted, geographic restrictions for the use of SURTASS LFA sonar require that the RL of the sound field transmitted by LFA sonar remain below 180 dB re 1 μ Pa (rms) at distances of 22 km (12 nmi) of any coastline, including islands, and 1 km (0.54 nmi) from the outer perimeter of the 22 designated OBIAs for SURTASS LFA sonar (Table 1). OBIAs are areas of the world's oceans outside of 22 km (12 nmi) of a coastline where marine mammals aggregate in high densities; carry out biologically important activities (e.g., breeding/calving, foraging, or migrating); or occur in small, distinct populations with a limited distribution. In the 2012 SEIS/SOEIS and the 2012 MMPA Final Rule, Navy and NMFS, respectively, designated 22 OBIAs for SURTASS LFA sonar as marine areas of critical biological importance to marine mammals (Table 1). Only one of the 22 OBIAs for SURTASS LFA sonar is in or even near the mission areas the Navy proposed to operate SURTASS LFA sonar during the period encompassed in this annual report. That OBIA is the Hawaiian Islands Humpback Whale NMS and Penguin Bank (OBIA 16), with the effective period from November through April, annually. However, no SURTASS LFA sonar missions occurred in Hawaiian waters during the 2014 to 2015 LOA effective period. Additionally, SURTASS LFA sonar is not operated in polar waters of either hemisphere.

3.2 MITIGATION AND BUFFER ZONE

The mitigation zone for SURTASS LFA sonar encompasses an ocean volume ensonified to a RL >180 dB re 1 μ Pa (rms) by LFA sonar transmissions. Based on spherical spreading, this zone will vary between the nominal horizontal ranges of 0.75 to 1.0 km (0.40 to 0.54 nmi) over a depth of approximately 87 to 157 meters (m) (285 to 515 feet [ft]) from the LFA sonar source array, with the center of the LFA sonar source array located at an approximate depth of 122 m (400 ft) below the sea surface. Under rare environmental conditions (e.g., strong acoustic duct), this range could be somewhat greater than 1 km (0.54 nmi). Knowledge of local environmental conditions (such as sound speed profiles [depth versus temperature] and sea state) that affect sound propagation is critical to maintaining the appropriate mitigation zone distance.

To determine the distance to the 180-dB rms isopleth from the LFA sonar source, local environmental data and underwater acoustic prediction models are used to determine the propagation of the LFA sonar signal in real-time. These sound field estimates are to be completed prior to and during LFA sonar transmissions. The propagation of the LFA sound field is to be updated at least every 12 hours, if not more frequently as meteorological or oceanographic (environmental) conditions vary (LOA Condition 8[c]). If the sound field analysis indicates that the distance to the 180-dB re 1 μ Pa isopleth (i.e., mitigation zone radius) has changed, the Officer in Charge (OIC) of the Military Crew (MILCREW) aboard the SURTASS LFA sonar vessels notifies the crew members and sonar operators conducting visual and acoustic mitigation monitoring so that their monitoring procedures incorporate the correct mitigation zone distance.

To further minimize the potential for injury to marine mammals, per the 2012 MMPA Final Rule and annual LOAs, NMFS requires an additional 1-km (0.54-nmi) buffer zone beyond the LFA mitigation zone. While the implementation of this additional buffer zone has proven to be practicable under current operations, the Navy's analysis indicates that adverse impacts below 180-dB re 1 μ Pa (rms) RL were not minimized appreciably (DoN, 2007).

3.3 RAMP-UP PROCEDURES FOR HF/M3 SONAR

Prior to transmission, calibration, or testing of SURTASS LFA sonar, the power level of the HF/M3 sonar system is to be ramped up over a period of no less 5 minutes from the maximum SL of 180 dB re 1 μ Pa @ 1 m (rms) (SPL) in 10-dB increments until the operating level is attained to ensure that there are no inadvertent exposures of local animals to RLs \geq 180 dB re 1 μ Pa (rms) from the HF/M3 sonar. This ramp-up procedure is to be conducted at least 30 minutes prior to any SURTASS LFA sonar transmission, prior to LFA sonar calibrations or testing that are not part of regular LFA sonar transmissions, and any time the HF/M3 sonar has been powered down for more than two minutes.

If a marine mammal is detected during the ramp-up procedure, the SPL of the HF/M3 sonar is not to be increased. Once marine mammals are no longer detected by visual or passive acoustic monitoring, the HF/M3 ramp-up process may resume.

3.4 SUSPENSION OR DELAY OF SURTASS LFA SONAR SIGNALS

If a marine mammal is detected within the mitigation or buffer zone, SURTASS LFA sonar transmissions are to be immediately suspended or delayed. LFA transmissions may commence/resume when there have been no further detections of a marine mammal for 15 minutes within the LFA mitigation and buffer zones.

3.5 MISSION PLANNING

The Navy ensures that no more 12% of any marine mammal stock is taken by MMPA Level B harassment during the annual LOA period. To accomplish this requirement, the Navy coordinates the mission planning for the SURTASS LFA sonar vessels and maintains a running total of the percentage of each marine mammal species or stock taken by MMPA Level B harassment by all four SURTASS LFA sonar vessels.

3.6 MITIGATION MONITORING MEASURES TO PREVENT INJURY TO MARINE ANIMALS

The purpose of mitigation monitoring measures is to ensure, to the greatest extent practicable, that no marine mammal is subjected to a sound pressure level of 180 dB re 1 μ Pa (rms) or greater. In accordance with the Navy's 2012 Record of Decision (DoD, 2012), 2012 MMPA Final Rule (50 CFR §218.235) (NOAA, 2012), and LOA conditions 9 and 10, three types of mitigation monitoring (Table 2) are conducted onboard LFA sonar vessels when SURTASS LFA sonar is transmitting:

- **Visual monitoring** from the bridge of the SURTASS LFA sonar vessel during daylight hours by personnel trained to detect and identify marine mammals using standard (7x) binoculars and the naked eye;
- **Passive acoustic monitoring** using the passive low-frequency (LF) SURTASS array to listen for sounds generated by marine mammals as an indicator of their presence when SURTASS LFA sonar is deployed and transmitting; and
- **Active acoustic monitoring** using the HF/M3 sonar, which is a Navy-developed, enhanced high frequency (HF) commercial sonar used to detect, locate, and track marine mammals that may pass close enough to the SURTASS LFA sonar array to enter the LFA mitigation and buffer zones.

Monitoring must commence at least 30 minutes before the first SURTASS LFA sonar transmissions; continue between sonar transmissions (pings); and persist until 15 minutes after the completion of SURTASS LFA sonar transmissions (or 30 minutes after sunset for visual monitoring) or until such time as marine mammals showing abnormal behavioral patterns return to normal or conditions prevent continued observations.

Table 2. Summary of mitigation measures and mitigation monitoring to prevent injury to marine mammals required for the operation of SURTASS LFA sonar.

MITIGATION MEASURE	CRITERIA	ACTIONS
Visual Monitoring	Potentially affected species near the vessel but outside the LFA mitigation zone plus 1-km (0.54-nmi) buffer zone	MILCREW OIC notified and animals tracked for possible intersection with mitigation/buffer zone
	Potentially affected species sighted inside the LFA mitigation zone plus 1-km (0.54-nmi) buffer zone	SURTASS LFA sonar transmissions delayed/suspended
Passive Acoustic Monitoring	Marine mammal species detected in the LFA mitigation zone plus 1-km (0.54-nmi) buffer zone	MILCREW OIC notified; SURTASS LFA sonar transmissions delayed/suspended
Active Acoustic (HF/M3) Monitoring	Contact detected and determined to have a track that would pass within the LFA mitigation zone plus 1-km (0.54-nmi) buffer zone	MILCREW OIC notified and animals tracked for possible intersection with mitigation/buffer zone
	Potentially affected species detected inside the LFA mitigation zone plus 1-km (0.54-nmi) buffer zone	SURTASS LFA sonar transmissions delayed/suspended

Additionally, marine mammal biologists qualified in conducting visual at-sea monitoring for marine mammals are to train the personnel of each SURTASS LFA sonar vessel designated to conduct visual monitoring. These lookouts are to be trained in conducting at-sea visual monitoring and in effectively communicating information about their visual detections within their command structure.

4 MONITORING AND REPORTING REQUIREMENTS

4.1 MONITORING

In addition to designating qualified personnel to conduct the mitigation, monitoring, and reporting required by the MMPA rulemaking and annual LOAs for SURTASS LFA sonar employment, the Navy also cooperates with NMFS and other Federal agencies in monitoring the impacts potentially associated with SURTASS LFA sonar activities. Further, the Navy is tasked with conducting four types of monitoring actions designed to increase the knowledge of affected marine mammal species or their environment.

4.1.1 POTENTIAL RESEARCH ON THE EFFECTS OF SURTASS LFA SONAR ON BEAKED WHALES AND/ OR HARBOR PORPOISES

To increase understanding of how harbor porpoises and beaked whale species respond behaviorally and physiologically when exposed to SURTASS LFA sonar, the 2012 MMPA rulemaking for SURTASS LFA sonar employment (NOAA, 2012) charged the Navy with assessing different types of monitoring and research that might address this goal. The Navy was to convene a Scientific Advisory Group (SAG) of recognized scientific subject matter experts to identify feasible monitoring and/or research options the Navy could implement to assess the potential for effects from SURTASS LFA sonar on beaked whales or harbor porpoises. The SAG recommendations are considered independent scientific findings that are fully accessible to the public. Following the Navy's receipt of the SAG research or monitoring

recommendations, per the MMPA Final Rule, the Navy is to prepare a plan of action outlining their strategy for implementing the SAG's recommendations or describe, in writing, why none of the SAG's recommendations are feasible and meet with NMFS to discuss any other potential options (NOAA, 2012). Per condition 12(a) of the 2014 to 2015 LOAs for SURTASS LFA sonar, the Navy is to complete their consideration of the SAG report.

4.1.2 MARINE MAMMAL MONITORING (M3) PROGRAM

Condition 12b of the LOAs for SURTASS LFA sonar require the Navy to continue to assess data acquired by its Marine Mammal Monitoring (M3) program and work toward making some portion of that data, after appropriate security reviews, available to scientists with appropriate clearances, and ultimately after further security reviews, make the data publicly available. The Navy's M3 program entails the use of Navy static and mobile passive acoustic systems to detect and identify marine mammal species, track movements of individual or groups of cetaceans, often over long periods. From this information, seasonal occurrence patterns over ocean basins can be established. M3 acousticians can also determine short-term and long-term effects on cetacean behavior associated with underwater anthropogenic sound (e.g., oil and gas seismic surveys using airgun arrays; military sonars) during specific activities.

4.1.3 PASSIVE ACOUSTIC MONITORING

Since the SURTASS component is such an effective passive acoustic monitoring system, NMFS has requested as a condition of the annual LOAs (Condition 12[c]) that the Navy continue to explore the potential to use the SURTASS towed horizontal line array with other Navy assets or range monitoring programs to augment the collection of data on marine mammal vocalizations prior to, during, or after Navy exercises.

4.1.4 AMBIENT NOISE MONITORING

Ambient noise is the typical or persistent background noise that is present in the marine environment. Ambient noise is broadband in all frequencies and directional both horizontally and vertically. Under LOA condition 12(d), the Navy is to continue collecting data on ambient underwater noise with the goal of potentially declassifying and archiving the data for future incorporation into oceanic underwater noise budgets and databases.

4.2 REPORTING REQUIREMENTS

NMFS-directed reporting under the MMPA Final Rule and annual LOAs provide information for assessments of whether incidental harassment of marine mammals occurred within the SURTASS LFA mitigation/buffer zones during routine training, testing, and military operations based on data from the mitigation monitoring (visual, passive acoustic, active acoustic) data records. Data analysis of post-operational information is utilized to estimate the percent of marine mammal stocks potentially exposed to SURTASS LFA signals at ≥ 180 dB (RL) and < 180 dB re 1 μ Pa (rms) RLs.

During routine training, testing, and military operations of SURTASS LFA sonar, technical and environmental data are collected and recorded, including data on visual and acoustic monitoring, ocean environmental measurements, and technical operational inputs. As stipulated in the MMPA Final Rule and LOAs, quarterly, annual, and comprehensive reports are required to be submitted to NMFS:

- Quarterly classified and unclassified mission reports for each SURTASS LFA sonar vessel must be submitted 30 days after the end of each quarter beginning on the date of the LOA's effectiveness. Even if no missions were conducted by a vessel, a report of negative activity must be submitted. Dates, times, and locations of each LFA sonar mission will be included in the quarterly mission reports as well as information on LFA sonar transmissions, including the number of times the sonar transmissions were suspended or delayed due to mitigation protocol procedures. The distance from the LFA sonar array to the 180 dB re 1 μ Pa (rms) isopleth is also to be noted. Additionally, any detection of marine mammals, including their range and bearing to the SURTASS LFA sonar vessel

are to be reported and the takes of marine mammals associated with the LFA sonar transmissions that quarter are to be estimated and documented in the report as well as the running total of affected stock percentages for the annual period.

- Annual reports, which are unclassified summaries of the quarterly reports, are submitted to NMFS 45 days after the expiration of the LOAs and include the Navy's estimates of the marine mammal stock percentages affected by all SURTASS LFA sonar vessel operations for the annual effective LOA period.
- A final comprehensive report, which is an unclassified assessment of any impacts of SURTASS LFA sonar on marine mammal stocks during the 5-year period of the MMPA regulations, is submitted to NMFS and the public at least 240 days prior to expiration of the MMPA Final Rule regulations.

Additionally, the Navy is required under LOAs Condition 12(a) to include the status in its next LOAs application on the progress it has made regarding assessing and making some portion of the data collected by the Navy's passive underwater arrays available to scientists, after appropriate security review. Further, LOAs Condition 12(b) requires that the Navy draft a plan of action describing its strategy for implementing the SAG's research and monitoring recommendations to increase the understanding of the potential effects of LFA sonar transmissions on beaked whales and/or harbor porpoises, or submit a written description to NMFS regarding why such research is not feasible/or is unlikely, which will be followed by a meeting with NMFS to discuss any other potential options. Last, LOA Condition 12(c) requires the Navy to systematically monitor the principal stranding networks and media in SURTASS LFA sonar's mission areas to correlate analysis of any strandings of marine mammals with SURTASS LFA sonar operations.

5 SUMMARY OF SURTASS LFA SONAR OPERATIONS AND MITIGATION MONITORING MEASURES FROM 15 AUGUST 2014 TO 14 AUGUST 2015

Per 50 CFR § 218.236(b) and Condition 13(f) of the LOAs, this annual report is the unclassified summary for the period from 15 August 2014 through 14 August 2015 of the quarterly reports under the third year LOAs of the five-year Final Rule period for the USNS VICTORIOUS, USNS ABLE, USNS EFFECTIVE, and USNS IMPECCABLE. During this reporting period, 10 missions were conducted in four of the Navy's northwestern Pacific Ocean mission areas for SURTASS LFA using four SURTASS LFA sonar systems onboard four SURTASS LFA sonar vessels. This annual report details the one mission conducted by the USNS VICTORIOUS (T-AGOS 19), one mission conducted by the USNS ABLE (T-AGOS 20), six missions conducted by the USNS EFFECTIVE (T-AGOS 21), and two missions conducted by the USNS IMPECCABLE (T-AGOS 23) during the 2014 to 2015 annual reporting period (Table 3). In total during this third annual LOA reporting period under the MMPA five-year Rule, the Navy conducted 10 SURTASS LFA sonar missions over 22.9 days that resulted in total LFA sonar transmissions of 51.6 hours (hr). These hours represent 2.98% of the Navy's annual permitted 1,728 hr of LFA sonar transmit time for four SURTASS LFA sonar vessels. During the 51.6 hr of LFA sonar transmissions, and in accordance with the mitigation monitoring protocol for SURTASS LFA sonar, LFA sonar was suspended or delayed 11 times during the 2014 through 2015 annual LOA reporting period due to six visual and seven active acoustic (HF/M3) detections of possible marine animals in the LFA mitigation plus buffer zones (Table 3). During all missions of the annual period, 60 additional suspensions or delays of LFA sonar transmissions resulted from equipment failures or the need to reset the sonar waveforms or other non-mitigation related factors. No passive acoustic detections were reported from within the mitigation and buffer zones. Although no passive acoustic detections of marine mammals were made within the LFA mitigation or buffer zones during any SURTASS LFA sonar missions, 29 passive acoustic detections were identified as three marine mammal species (Bryde's, fin, and humpback whales) and were evaluated to be located beyond the mitigation and buffer zones by the MILCREW sonar operators and engineers.

ANNUAL REPORT NO. 3: NAVY OPERATION OF SURTASS LFA SONAR 2014 TO 2015

Table 3. Summary of SURTASS LFA sonar operations for the LOA annual reporting period 15 August 2014 through 14 August 2015 for all vessels.

LFA VESSEL	NUMBER TOTAL ANNUAL MISSIONS	TOTAL MISSION DURATION (DAYS)	TOTAL LFA SONAR TRANSMISSIONS (HOURS)	NUMBER VISUAL DETECTIONS	NUMBER PASSIVE ACOUSTIC DETECTIONS	NUMBER PASSIVE ACOUSTIC DETECTIONS OUTSIDE MITIGATION/ BUFFER ZONES	NUMBER ACTIVE ACOUSTIC (HF/M3) DETECTIONS	NUMBER LFA SONAR SUSPENSIONS/ DELAYS PER MITIGATION PROTOCOL	NUMBER LFA SONAR SUSPENSIONS/ DELAYS DUE TO NON- MITIGATION FACTORS
USNS VICTORIOUS (T-AGOS 19)	1	0.6	1.3	0	0	0	0	0	5
USNS ABLE (T-AGOS 20)	1	1.6	2.6	0	0	0	1	1	2
USNS EFFECTIVE (T-AGOS 21)	6	14.4	36.6	5	0	11	5	9	30
USNS IMPECCABLE (T-AGOS 23)	2	6.3	11.1	1	0	18	1	1	23
ANNUAL TOTALS	10	22.9	51.6	6	0	29	7	11	60

5.1 USNS VICTORIOUS MISSIONS

During the second quarter of the 2014 to 2015 LOA reporting period, the USNS VICTORIOUS (T-AGOS 19) completed one mission during which LFA sonar was transmitted for 1.3 hr over 0.6 mission days (Table 3). No active or passive acoustic or visual detections of marine animals were made during the VICTORIOUS' one mission. Thus, LFA sonar transmissions were not suspended/delayed due to mitigation monitoring protocol. However, LFA sonar transmissions were suspended/delayed five times during the mission due to equipment faults. The USNS VICTORIOUS conducted no other LFA sonar missions and reported negative activity during all other quarters of the annual LOA period.

5.2 USNS ABLE MISSIONS

The USNS ABLE (T-AGOS 20) conducted one SURTASS LFA sonar mission during the first quarter of the 2014 to 2015 effective period. The duration of the mission was 1.6 mission days, during which LFA sonar was transmitted for a total of 2.6 hr. No visual or passive acoustic detections of marine animals were made during the mission, but one HF/M3 detection of possible marine animals resulted in one delay/suspension of LFA sonar transmissions. Two other suspensions/delays of LFA sonar transmissions related to equipment or operational issues and not mitigation-related factors also occurred during the ABLE's single mission during the annual period. The ABLE reported negative activity for the remaining three quarters of the 2014 to 2015 LOA period.

5.3 USNS EFFECTIVE MISSIONS

The USNS EFFECTIVE (T-AGOS 21) completed six total missions during the 2014 to 2015 LOA reporting period totaling 36.6 hr of LFA sonar transmissions over 14.4 mission days (Table 3). Five total visual detections of marine mammals were made during these missions, although the visual detection made during the EFFECTIVE's sixth mission, originally identified as a pod of dolphins, upon reassessment was determined to have been a school of tuna. During the EFFECTIVE's second mission, two separate visual detections of a group of dolphins and whales were made, while during the EFFECTIVE's fifth mission, two additional visual detections, one of a sea turtle and unidentified whale, and another of a group of dolphins, were reported. No passive acoustic detections were made within the mitigation/buffer zones, but 11 detections of marine mammal vocalizations were identified beyond the mitigation/buffer zones during the EFFECTIVE's six missions. These passive acoustic detections were identified to species as Bryde's and humpback whales. Five active acoustic (HF/M3) detections were made during the EFFECTIVE's missions. In total, LFA sonar transmissions were delayed/suspended nine times during the EFFECTIVE's six missions due to HF/M3 or visual detections of marine animals. The EFFECTIVE did not conduct any missions, reporting negative activity, during the second quarter of the 2014 to 2015 LOA period.

5.4 USNS IMPECCABLE MISSIONS

The USNS IMPECCABLE (T-AGOS 23) had three quarters of negative activity but conducted two missions during the last quarter of the 2014 to 2015 effective LOA period. These two missions were conducted over 6.3 mission days for a total of 11.1 hr of LFA sonar transmit time. During one of the IMPECCABLE's missions, one concurrent visual and active acoustic (HF/M3 sonar) detection of marine animals were reported within the LFA mitigation and buffer zones. Thus, one delay/suspension of LFA sonar transmissions occurred during this mission of the USNS IMPECCABLE due to detections of possible marine animals. The visual observers reported a pod of dolphins at a range of 50 to 200 yards, but following a reassessment of the sighting by the visual observers, the detection was determined to be a school of tuna. Twenty-three additional delays or suspensions of LFA sonar transmissions resulted from equipment faults or wavetrain reconfiguration. No passive acoustic detections of marine mammal vocalizations were detected within the LFA mitigation/buffer zones but 18 total passive acoustic detections beyond the mitigation/buffer zones identified as Bryde's and/or fin whales were made during the IMPECCABLE's missions. Additionally, 23 total delays/suspensions of LFA sonar transmissions due

to equipment, waveform reconfigurations, or other operational adjustments occurred during the IMPECCABLE's two missions during the 2014 to 2015 period.

5.5 VISUAL OBSERVER TRAINING

In compliance with the regulations of the MMPA Final Rule (50 CFR 216 Subpart Q) and annual LOAs for SURTASS LFA sonar employment, a senior marine biologist from Marine Acoustics, Inc. (MAI) qualified in conducting at-sea visual monitoring of marine mammals from surface vessels conducted training sessions for the civilian crew members designated as lookouts aboard two of the SURTASS LFA sonar vessels during the effective 2014 to 2015 effective LOA period. Trainings were conducted for lookouts and civilian officers from the USNS ABLE (August 2014) and USNS VICTORIOUS (July 2015) during vessel port visits.

The visual monitoring training consists of three training modules: 1) monitoring component that covers the requirements and fundamentals of at-sea visual monitoring for marine species specified under permits for LFA sonar; 2) a marine mammal identification component that describes basic information about the potentially occurring species and characteristics to identify them at sea; and 3) a short game-type quiz of the materials covered during the training to determine the retention level of the trainees.

The observation-training component includes an overview of the reasons why visual monitoring of marine species is conducted during LFA sonar operations as well as the monitoring requirements and procedures per the LOA and Incidental Take Statement (ITS) permits and the importance of conducting the visual mitigation procedures. The other types of monitoring required during active LFA sonar operations, passive and active acoustic monitoring with the SURTASS array and HF/M3 sonar, respectively, are also reviewed so a complete understanding of the mitigation conducted aboard the SURTASS LFA sonar vessels is clear to the civilian deck crew. Communication between the civilian crew's command structure and the MILCREW conducting the other types of monitoring is stressed. Visual monitoring and reporting procedures are reviewed as are the cues the lookouts may spot on the water's surface that indicate the presence of marine mammals and possibly sea turtles. Additionally, factors that may affect the ability to detect marine mammals on the ocean surface are discussed and an overview of marine mammal behavior and video examples of some of those behaviors are presented. Last, in the observation-training component, information on stranded, struck, injured, or dead animals is reviewed, including the reporting procedures should animals in these conditions be observed. Emphasis is placed on the importance of vigilantly monitoring for marine mammals and consistently completing data forms to document their effort, since the information the lookouts collect is reported ultimately to NMFS.

The marine mammal and sea turtle identification training-component includes basic information about the types of marine mammals; species that may be encountered in the mission areas in which SURTASS LFA may operate; features of each marine mammal species that are apparent at the sea surface; and photographs, video clips, audio clips, and surface profiles of the potentially occurring marine mammal species. In an effort to ascertain whether the training material was presented in an understandable manner and whether the trainees were retaining the information, following completion of the training components, the trainees participate in a game-style quiz. Feedback is also sought from the trainees to gauge whether the trainings were successful and what aspects may need to be adjusted.

A set of marine mammal species guides and a training manual to be retained aboard each vessel are provided for future reference and training as new lookouts come aboard. The training manual includes electronic and hard copies of the visual monitoring training, a DVD copy of the Navy's Marine Species Awareness Training video, a list of all the marine mammal species likely to be encountered during SURTASS LFA sonar missions, and copies of the annual LOA and ITS for the respective vessels.

5.6 PASSIVE ACOUSTIC TRAINING

The 2014 to 2015 LOAs and ITS under which the Navy is authorized to conduct LFA sonar operations aboard USNS VICTORIOUS, USNS ABLE, USNS EFFECTIVE, and USNS IMPECCABLE stipulate the

conditions governing the sonar's operation. One of the mitigation monitoring conditions requires the Navy to use the passive SURTASS to listen for vocalizing marine mammals. To meet this requirement, by direction of CNO Undersea Capabilities Branch (N2/N6F24), two senior marine acousticians from MAI conducted a passive acoustic training for the MILCREW of the USNS VICTORIOUS, USNS ABLE, USNS EFFECTIVE, and USNS IMPECCABLE who conduct passive acoustic monitoring as part of their duties as sonar operators during SURTASS LFA sonar missions. Additionally, the MILCREW of the USNS LOYAL, an USNS T-AGOS vessel that is not outfitted with SURTASS LFA sonar, was also trained to increase their ability as sonar operators to distinguish biological sounds from those of mission-directed sounds.

The passive acoustic training consisted of a classified presentation that included: 1) an introductory component that covered the requirements of passive acoustic monitoring for marine species specified under permits for LFA sonar employment; 2) a marine mammal identification component that described basic information about the primary marine mammal species they may detect on SURTASS and species-specific characteristics for visual identification on spectrograms during passive acoustic monitoring; and 3) recommended sonar display parameters to facilitate the detection and identification of marine mammal species.

The introductory component included an overview of the reasons why mitigation monitoring of marine species is conducted during SURTASS LFA sonar transmissions, the monitoring requirements and procedures per the LOAs and ITS permits, and the importance of this task to the Navy's continued ability to operate SURTASS LFA sonar. The other types of mitigation monitoring required during SURTASS LFA sonar operations, visual monitoring and active acoustic monitoring with the HF/M3 sonar, were also discussed. Passive acoustic reporting procedures were reviewed, including an explanation of how the information the MILCREW collects is reported to other Navy organizations and ultimately to NMFS.

The marine mammal identification component of the training included basic information about the species of marine mammals they could be detected by the SURTASS passive array. The migratory and vocalization behavior of each of those marine mammal species was described, as well as key features of exemplar spectrograms used to identify each species. The parameters of the sonar displays were discussed, with recommended settings to aid with classifying detected biological signals to a specific marine mammal species. Many of the settings used by M3 sonar operators when reviewing data from Navy fixed arrays and SURTASS for marine mammal vocalizations are different from those typically used for mission-directed sonar operations.

Work is ongoing by MAI marine acousticians to develop a tactical identification guide to aid in acoustic recognition and identification of marine species for use onboard SURTASS vessels. The identification guide will include multiple spectrograms for known and unknown marine animal sources shown with different parameter settings designed in the format of an identification key, similar to a botanical or bird field guide. Recommended parameter settings for each species will be provided, with spectrograms demonstrating how different settings affect not only the displayed spectrogram but also the ability to detect and classify species.

Passive acoustic monitoring crews from the VICTORIOUS, ABLE, EFFECTIVE, and IMPECCABLE have been made aware of their mitigation monitoring and reporting duties and responsibilities when SURTASS LFA sonar is transmitting and the importance of their role in the Navy's continuing authorization to operate SURTASS LFA sonar. In addition, they, as well as the LOYAL MILCREW, have expanded their awareness of the methods for detecting and identifying biological sounds from those of mission-directed importance.

6 ESTIMATES OF AFFECTED MARINE MAMMAL STOCKS

In its annual LOAs applications, the Navy provided estimates of the percentage of marine mammal stocks potentially affected during a proposed nominal number of missions in specific mission areas requested for

SURTASS LFA sonar employment, including the four mission areas in which sonar operations occurred during the August 2014 to 2015 LOA period; the pre-mission estimates for the four mission areas in which missions were conducted during 2014 to 2015 are combined and provided herein (Table 4) for comparison with the post-mission take estimates based on actual LFA sonar transmit hours.

In this annual report, the Navy provides the post-mission summaries detailing quarterly and annually estimated percentages of the marine mammal stocks and number of marine mammals in each stock incidentally harassed using predictive modeling based on seasons, location of the missions, LFA sonar characteristics, length of sonar exposure (i.e., actual LFA sonar transmit hours), oceanographic/environmental conditions, and animal demographics (abundances and density estimates) for each of the four SURTASS LFA sonar vessels that transmitted LFA sonar during the August 2014 to 2015 LOA effective period. Per LOAs Condition 13(e), this information has been submitted to NMFS as quarterly reports following the end of each quarter of the August 2014 to 2015 reporting period. An overview of the methodology, criteria, and thresholds used for the predictive modeling of the acoustic impact and sonar risk assessment and resulting computation of the incidental harassment estimates detailed herein may be found in the SURTASS LFA sonar Final SEIS/SOEIS (DoN, 2012).

6.1 PRE-MISSION ESTIMATES OF POTENTIALLY AFFECTED MARINE MAMMAL STOCKS

Pre-mission estimates were derived using a number of nominal seven-day missions for each potential mission area, which provided a conservative estimate of the potential effects on marine mammal stocks in those areas where employment of LFA sonar was proposed in the Navy's 2014 LOAs application (DoN, 2014). During the August 2014 to August 2015 period detailed in this annual report, the Navy conducted SURTASS LFA sonar missions in four mission areas within the northwestern Pacific Ocean for which pre-operational risk estimates of marine mammal stocks had been estimated; those original estimates have been combined herein (Table 4).

The pre-mission estimates of MMPA harassment (i.e., 120 to 180 dB and ≥ 180 dB, Level B and A, respectively) for marine mammal stocks in these LFA mission areas were well below the 12% Level B per stock maximum criteria delineated by NMFS in LOA Condition 6 (Appendix A) and the Final Rule (77 FR 50290) (NOAA, 2012). The highest combined total percentage of any affected stock was estimated as 8.53% or 98 whales of the Western North Pacific (WNP) stock of humpback whales, with the next highest affected stock estimated as 7.32% of the WNP stock of Longman's beaked whales (Table 4). The highest number of affected animals were 4,081 striped dolphins in the WNP stock.

6.2 POST-MISSION ESTIMATES OF POTENTIALLY AFFECTED MARINE MAMMAL STOCKS

Overall mission planning during the annual period of the LOAs was fundamentally based on national security and operational anti-submarine warfare requirements. Mission planning for each quarter of the annual LOA period additionally considered the running total percentage of affected marine mammal stocks so that no more than 12% of any marine mammal stock would be taken by MMPA Level B harassment annually by all SURTASS LFA sonar vessels combined (LOA Condition 6). The same analysis methodology and population data (densities and abundances) were utilized to compute both pre- and post-mission take estimates (Appendix B) (DoN, 2014).

During the August 2014 through August 2015 LOA period, the highest post-mission percentage of any marine mammal stock estimated to be taken by MMPA Level B harassment (RLs 120 to 180 dB) for all SURTASS LFA sonar vessels combined during their 10 LFA sonar missions and 51.6 hr of LFA sonar transmissions was estimated as 4.38% or 53 humpback whales in the WNP stock (Table 5), which was well below the 12% cap per stock on Level B harassment. As with the pre-mission take estimates, the WNP stock of Longman's beaked whales was the second highest percentage of takes based on actual LFA sonar transmit hours, with 2.796% or 32 beaked whales taken during the 10 LFA sonar missions

Table 4. Combined pre-mission estimates of the percentage and number of marine mammals potentially affected at RLs of 120 to 180 dB SPE by LFA sonar transmissions in the four northwestern Pacific Ocean mission areas where LFA sonar was employed from August 2014 to August 2015; 0.00 percent/0 animals affected at RLs \geq 180 dB (with mitigation); estimates based on 10 7-day SURTASS LFA sonar missions across seasons (DoN, 2014); ESA-listed species highlighted.

Marine Mammal Species	Stock ³	Winter		Fall		Spring		Summer		Total	
		Percent Affected 120-180 dB ⁴	Number Animals Affected 120-180 dB ⁵	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB
Blue whale	CNP	~0.01	3	0.00	1	~0.01	2	— ⁶	—	0.02	6
Bryde's whale	WNP	0.30	63	0.04	8	0.13	29	0.21	47	0.68	147
Common minke whale	WNP "O"	1.24	313	0.20	51	0.61	154	0.81	204	2.86	722
Common minke whale	WNP "J"	7	7	7	7	2.62	24	7	7	2.62	24
Fin whale	WNP	0.27	18	7	7	0.13	14	—	—	0.40	32
Humpback whale	WNP	4.08	47	0.92	11	3.53	40	—	—	8.53	98
North Pacific right whale	WNP	0.05	1	—	—	0.05	2	—	—	0.10	3
Omura's whale	WNP	0.52	8	0.04	1	0.21	4	0.21	6	0.94	19
Sei whale	NP	0.10	9	7	7	0.10	9	—	—	0.20	18
Western Pacific gray whale	WNP	7	7	7	7	0.31	1	—	—	0.31	1

3 CNP= Central North Pacific; WNP=Western North Pacific; NP=North Pacific; IA=Inshore Archipelago; NMI=Northern Mariana Islands

4 The total percent affected has been rounded up to two decimal places.

5 Fractional animals potentially affected have been rounded up to the next whole number.

6 "—" indicates that an animal is not expected to occur in the LFA mission area during that season.

7 Even though this species could potentially occur in multiple seasons (typically fall through spring) in some of the western North Pacific mission areas, all season's of estimated takes were not presented in the 2014 to 2015 LOAs application for SURTASS LFA sonar—only specific seasons were modeled and presented for each mission area; for this reason, take estimates are only presented herein as they were presented in the LOAs application. This does not indicate that this species does not occur in all seasons. In the post-mission take estimation, takes were estimated for potentially occurring species in the season in which the missions occurred.

Table 4. Combined pre-mission estimates of the percentage and number of marine mammals potentially affected at RLs of 120 to 180 dB SPE by LFA sonar transmissions in the four northwestern Pacific Ocean mission areas where LFA sonar was employed from August 2014 to August 2015; 0.00 percent/0 animals affected at RLs ≥ 180 dB (with mitigation); estimates based on 10 7-day SURTASS LFA sonar missions across seasons (DoN, 2014); ESA-listed species highlighted.

Marine Mammal Species	Stock ³	Winter		Fall		Spring		Summer		Total	
		Percent Affected 120-180 dB ⁴	Number Animals Affected 120-180 dB ⁵	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB
Blainville's beaked whale	WNP	0.86	71	0.08	7	0.58	48	0.47	39	1.99	165
Common bottlenose dolphin	WNP	0.69	1,158	0.10	170	0.07	135	0.52	879	1.38	2,342
Common bottlenose dolphin	IA	7	7	7	7	0.01	5	7	7	0.01	5
Cuvier's beaked whale	WNP	0.40	364	0.01	4	0.27	241	0.20	179	0.88	788
Dwarf sperm whale	WNP	0.06	223	7	7	0.06	223	0.02	85	0.14	531
False killer whale	WNP Pelagic	1.57	264	0.20	33	0.40	69	1.05	175	3.22	541
False killer whale	IA	7	7	7	7	0.19	19	7	7	0.19	19
Fraser's dolphin	WNP	1.41	450	0.03	57	1.34	285	0.54	286	3.32	1,078
Ginkgo-toothed beaked whale	NP	0.27	64	0.03	7	0.17	41	0.16	36	0.63	148
Killer whale	WNP	0.09	13	0.01	2	0.07	11	0.05	8	0.22	34
<i>Kogia</i> spp.	WNP	0.05	191	0.01	30	0.04	124	0.04	136	0.14	481
Longman's beaked whale	WNP	2.90	31	0.37	4	2.40	26	1.65	18	7.32	79
Melon-headed whale	WNP	0.92	341	0.13	49	0.33	124	0.65	241	2.03	755

Table 4. Combined pre-mission estimates of the percentage and number of marine mammals potentially affected at RLs of 120 to 180 dB SPE by LFA sonar transmissions in the four northwestern Pacific Ocean mission areas where LFA sonar was employed from August 2014 to August 2015; 0.00 percent/0 animals affected at RLs ≥ 180 dB (with mitigation); estimates based on 10 7-day SURTASS LFA sonar missions across seasons (DoN, 2014); ESA-listed species highlighted.

Marine Mammal Species	Stock ³	Winter		Fall		Spring		Summer		Total	
		Percent Affected 120-180 dB ⁴	Number Animals Affected 120-180 dB ⁵	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB	Percent Affected 120-180 dB	Number Animals Affected 120-180 dB
Melon-headed whale	NMI	1.79	45	7	7	1.79	45	1.79	45	5.37	135
Pacific white-sided dolphin	WNP	0.05	478	—	—	0.02	165	—	—	0.07	643
Pantropical spotted dolphin	WNP	0.42	1,816	0.03	146	0.21	919	0.22	959	0.88	3,840
Pantropical spotted dolphin	IA	7	7	7	7	0.06	142	7	7	0.06	142
Pygmy killer whale	WNP	0.56	172	0.08	24	0.10	34	0.40	120	1.14	350
Pygmy sperm whale	WNP	0.03	91	7	7	0.03	91	0.01	35	0.07	217
Risso's dolphin	WNP	1.05	875	0.19	159	0.37	309	0.79	670	2.40	2,013
Risso's dolphin	IA	7	7	7	7	0.21	173	7	7	0.21	173
Rough-toothed dolphin	WNP	0.40	578	0.08	111	0.22	325	0.29	433	0.99	1,447
Short-beaked common dolphin	WNP	0.07	2,189	7	7	0.02	553	0.03	958	0.12	3,700
Short-finned pilot whale	WNP	1.81	971	0.23	124	0.79	426	1.10	593	3.93	2,114
Sperm whale	NP	0.14	138	0.01	15	0.07	74	0.07	82	0.29	309
Spinner dolphin	WNP	0.01	93	0.00	9	0.01	48	0.01	55	0.03	205
Striped dolphin	WNP	0.38	2,170	0.03	175	0.11	651	0.22	1,245	0.74	4,081
Striped dolphin	IA	7	7	7	7	0.01	61	7	7	0.01	61

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Table 5. Total annual and quarterly summary of post-mission percentages of affected marine mammal stocks and number of marine mammals resulting from 10 LFA sonar missions and 51.6 hr of LFA sonar transmissions conducted by four SURTASS LFA sonar vessels for the LOA reporting period 15 August 2014 through 14 August 2015 (ESA-listed marine mammal species highlighted).

All Affected Marine Mammal Species/Species Groups	Number Marine Mammals in Stock	Stock Name ³	120 to 180 dB										≥180 dB (with Mitigation)	
			Quarter 1 (August to November)—All Vessels		Quarter 2 (November to February)—All Vessels		Quarter 3 (February to May)—All Vessels		Quarter 4 (May to August)—All Vessels		Annual Total— All Vessels		Annual Total— All Vessels	
			Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected
Mysticetes														
Blue whale	9,250	CNP	0.0053%	3	0.0005%	1	0.0050%	2			0.0107%	6	0.0000%	0
Bryde's whale	20,501	WNP	0.1012%	23	0.0267%	5	0.0511%	12	0.1764%	40	0.3554%	80	0.0000%	0
Common minke whale	25,049	WNP "O"	0.0981%	26	0.0695%	18	0.4402%	111	0.3346%	84	0.9424%	239	0.0000%	0
Common minke whale	893	WNP "J"							0.9712%	9	0.9712%	9	0.0000%	0
Fin whale	9,250	WNP	0.0047%	1	0.0092%	1	0.1014%	11	0.0131%	14	0.1283%	27	0.0000%	0
Humpback whale	1,107	WNP	0.3311%	6	0.3416%	4	3.6879%	42	0.0148%	1	4.3754%	53	0.0000%	0
North Pacific right whale	922	WNP			0.0046%	1	0.0058%	1	0.0148%	1	0.0252%	3	0.0000%	0
Sei whale	86	NP	0.1401%	13							0.1401%	13	0.0000%	0
Western North Pacific gray whale	121	WNP							0.1143%	1	0.1143%	1	0.0000%	0
Odontocetes														
Blainville's beaked whale	8,032	WNP	0.6195%	52	0.0186%	2	0.0653%	6	0.1293%	12	0.8327%	72	0.0000%	0
Common bottlenose dolphin	168,791	WNP offshore	0.0572%	98	0.0333%	57	0.0650%	110	0.1531%	259	0.3086%	524	0.0000%	0
Common bottlenose dolphin	105,138	IA							0.0016%	2	0.0016%	2	0.0000%	0
Cuvier's beaked whale	90,725	WNP	0.2833%	259	0.0178%	17	0.0569%	53	0.0975%	90	0.4555%	419	0.0000%	0
Dwarf sperm whale	350,553	WNP	0.0867%	304							0.0867%	304	0.0000%	0
False killer whale	16,668	WNP	0.3090%	52	0.0672%	12	0.2446%	42	0.2622%	44	0.8830%	150	0.0000%	0
False killer whale	9,777	IA							0.0694%	7	0.0694%	7	0.0000%	0
Fraser's dolphin	220,789	WNP	0.0059%	14	0.0073%	17	0.0476%	106	0.0394%	88	0.1002%	225	0.0000%	0
Fraser's dolphin	10,226	CNP	1.7309%	177							1.7309%	177	0.0000%	0
Ginkgo-toothed beaked whale	22,799	NP	0.1747%	42	0.0050%	2	0.0230%	6	0.0456%	12	0.2482%	62	0.0000%	0
Killer whale	12,256	WNP	0.0501%	8	0.0009%	1	0.0112%	3	0.0221%	4	0.0843%	16	0.0000%	0
Kogia spp.	350,553	WNP	0.0017%	6	0.0308%	108	0.0288%	102	0.0203%	72	0.0815%	288	0.0000%	0
Longman's beaked whale	1,007	WNP	1.7691%	18	0.0025%	1	0.2846%	4	0.7394%	9	2.7956%	32	0.0000%	0
Melon-headed whale	36,770	WNP	0.0304%	12	0.0425%	16	0.1636%	61	0.2466%	92	0.4832%	181	0.0000%	0
Melon-headed whale	2,450	NMI	0.4605%	170							0.4605%	170	0.0000%	0
Pacific white-sided dolphin	931,000	WNP			0.1181%	1,100	0.0187%	174			0.1367%	1,274	0.0000%	0
Pantropical spotted dolphin	438,064	WNP	0.2348%	1,030	0.0126%	56	0.0472%	208	0.0477%	210	0.3424%	1,504	0.0000%	0
Pantropical spotted dolphin	219,032	IA							0.0239%	53	0.0239%	53	0.0000%	0
Pygmy killer whale	30,214	WNP	0.0365%	12	0.0269%	9	0.0977%	31	0.1076%	33	0.2687%	85	0.0000%	0
Pygmy sperm whale	350,553	WNP	0.0353%	124							0.0353%	124	0.0000%	0
Risso's dolphin	83,289	WNP	0.0941%	80	0.0495%	42	0.3707%	310	0.2510%	210	0.7653%	642	0.0000%	0
Risso's dolphin	83,289	IA							0.0769%	65	0.0769%	65	0.0000%	0
Rough-toothed dolphin	145,729	WNP	0.1126%	166	0.0156%	23	0.1233%	181	0.1060%	156	0.3575%	526	0.0000%	0
Short-beaked common dolphin	3,286,163	WNP			0.0066%	218	0.0178%	585	0.0257%	846	0.0501%	1,649	0.0000%	0
Short-finned pilot whale	53,608	WNP	0.3745%	202	0.1016%	55	0.5542%	298	0.4316%	233	1.4619%	788	0.0000%	0
Sperm whale	102,112	NP	0.0575%	61	0.0046%	5	0.0214%	23	0.0230%	24	0.1065%	113	0.0000%	0
Spinner dolphin	1,015,059	WNP	0.0038%	40	0.0003%	4	0.0012%	14	0.0016%	17	0.0069%	75	0.0000%	0
Striped dolphin	570,038	IA							0.0039%	23	0.0039%	23	0.0000%	0
Striped dolphin	570,038	WNP	0.0547%	314	0.0233%	134	0.0855%	488	0.0881%	502	0.2515%	1,438	0.0000%	0

of 2014 to 2015 (Table 5). The highest number of any marine mammal stock estimated to be affected by SURTASS LFA sonar transmissions (RLs 120 to 180 dB) from all vessels during the annual LOA period was 1,649 short-beaked common dolphins of the WNP stock (Table 5). The percentage and number of animals in any marine mammal stocks affected by LFA sonar transmissions at RLs ≥ 180 dB (with mitigation) from all vessels during the annual reporting period were 0% and 0 marine mammals, respectively.

6.2.1 USNS VICTORIOUS (T-AGOS 19) POST-MISSION ESTIMATES OF POTENTIALLY AFFECTED MARINE MAMMAL STOCKS

The 1.3 hr of LFA sonar transmissions during the one mission the USNS VICTORIOUS conducted from 15 August 2014 through 14 August 2015 affected a maximum 0.34% of the WNP stock of humpback whales, representing 4 whales, at RLs of 120 to 180 dB (Table 6). The largest number of marine mammals estimated to be affected at RLs of 120 to 180 dB by the VICTORIOUS' mission was 1,100 Pacific white-sided dolphins in the WNP stock.

6.2.2 USNS ABLE (T-AGOS 20) POST-MISSION ESTIMATES OF POTENTIALLY AFFECTED MARINE MAMMAL STOCKS

The highest percentage of any marine mammal stock affected at RLs of 120 to 180 dB by the ABLE's one LFA sonar mission, during which 1.6 hr of LFA sonar was transmitted, during 2014 to 2015 was 0.19% of the WNP stock of humpback whales, or 3 humpbacks (Table 7). The largest number of marine mammals affected by the ABLE's LFA transmissions at RLs of 120 to 180 dB was 36 striped dolphins in the WNP stock.

6.2.3 USNS EFFECTIVE (T-AGOS 21) POST-MISSION ESTIMATES OF POTENTIALLY AFFECTED MARINE MAMMAL STOCKS

The USNS EFFECTIVE's six missions over the 2014 to 2015 annual LOA period entailed 36.6 hr of LFA sonar transmissions, which affected the highest estimated percentage of marine mammals of any of the vessels, 3.8% of humpback whales in the WNP stock (or 45 whales) at RLs of 120 to 180 dB (Table 8). The second highest percentage of affected stocks was the WNP stock of Longman's beaked whales, of which 2.3%, or 25 whales, were affected. An estimated 1,208 pantropical spotted dolphins in the WNP stock with the highest number of affected animals at RLs of 120 to 180 dB out of a stock estimated to include more than 438,064 animals.

6.2.4 USNS IMPECCABLE (T-AGOS 23) POST-MISSION ESTIMATES OF POTENTIALLY AFFECTED MARINE MAMMAL STOCKS

Completing two missions during the 2014 to 2015 LOA period, the USNS IMPECCABLE was responsible for transmitting 11.1 hr of LFA sonar transmissions, which affected a maximum of 0.42% of short-finned pilot whales in the WNP stock at RLs of 120 to 180 dB (Table 9). The highest number of marine mammals affected at RLs of 120 to 180 dB during the IMPECCABLE's two missions were 502 striped dolphins in the WNP stock.

6.3 SUMMARY OF AFFECTED MARINE MAMMAL SPECIES AND STOCKS

The post-operational incidental harassment estimates (Tables 5 through 9) for SURTASS LFA sonar transmissions during the 2014 to 2015 annual LOA period indicate that no marine mammals from any stocks in the northwestern Pacific Ocean were exposed to received levels at or above 180 dB (with mitigation applied). The highest overall percentage of any marine mammal stock exposed at RLs of 120 to 180 dB from all SURTASS LFA vessel transmissions during the 10 total missions conducted over the annual LOA reporting period was estimated as 4.4% for the WNP stock of humpback whales, which represented a 53 total affected animals (Table 5). The post-operational estimates are, therefore, significantly below the 12% allowed for any marine mammal stock under LOA Condition 6 and the Final

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Table 6. Post-mission quarterly and total annual estimates of the percentages of marine mammal stocks and the associated number of marine mammals in that stock affected by the one LFA sonar mission conducted by the USNS VICTORIOUS (T-AGOS 19) in the northwestern Pacific Ocean during the LOA reporting period from August 2014 to August 2015. ESA-listed marine mammals highlighted.

Marine Mammal Species/Species Groups	Number Animals in Stock	Stock Name	120 to 180 dB										≥180 dB (with Mitigation)	
			Quarter 1 (August to November)		Quarter 2 (November to February)		Quarter 3 (February to May)		Quarter 4 (May to August)		Total Annual		Total for Quarter and Annual	
			Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected
Mysticetes														
Blue whale	9,250	CNP			0.0005%	1					0.0005%	1	0.0000	0
Bryde's whale*	20,501	WNP			0.0267%	5					0.0267%	5	0.0000	0
Common minke whale	25,049	WNP "O"			0.0695%	18					0.0695%	18	0.0000	0
Fin whale	9,250	WNP			0.0092%	1					0.0092%	1	0.0000	0
Humpback whale	1,107	WNP			0.3416%	4					0.3416%	4	0.0000	0
North Pacific right whale	922	WNP			0.0046%	1					0.0046%	1	0.0000	0
Odontocetes														
Blainville's beaked whale	8,032	WNP			0.0186%	2					0.0186%	2	0.0000	0
Common bottlenose dolphin	168,791	WNP Offshore			0.0333%	57					0.0333%	57	0.0000	0
Cuvier's beaked whale	90,725	WNP			0.0178%	17					0.0178%	17	0.0000	0
False killer whale	16,668	WNP Pelagic			0.0672%	12					0.0672%	12	0.0000	0
Fraser's dolphin	220,789	WNP			0.0073%	17					0.0073%	17	0.0000	0
Ginkgo-toothed beaked whale	22,799	NP			0.0050%	2					0.0050%	2	0.0000	0
Killer whale	12,256	WNP			0.0009%	1					0.0009%	1	0.0000	0
Kogia spp.	350,553	WNP			0.0308%	108					0.0308%	108	0.0000	0
Longman's beaked whale	1,007	WNP			0.0025%	1					0.0025%	1	0.0000	0
Melon-headed whale	36,770	WNP			0.0425%	16					0.0425%	16	0.0000	0
Pacific white-sided dolphin	931,000	WNP			0.1181%	1100					0.1181%	1100	0.0000	0
Pantropical spotted dolphin	438,064	WNP			0.0126%	56					0.0126%	56	0.0000	0
Pygmy killer whale	30,214	WNP			0.0269%	9					0.0269%	9	0.0000	0
Risso's dolphin	83,289	WNP			0.0495%	42					0.0495%	42	0.0000	0
Rough-toothed dolphin	145,729	WNP			0.0156%	23					0.0156%	23	0.0000	
Short-beaked common dolphin	3,286,163	WNP			0.0066%	218					0.0066%	218	0.0000	0
Short-finned pilot whale	53,608	WNP			0.1016%	55					0.1016%	55	0.0000	0
Sperm whale	102,112	NP			0.0046%	5					0.0046%	5	0.0000	0
Spinner dolphin	1,015,059	WNP			0.0003%	4					0.0003%	4	0.0000	0
Striped dolphin	570,038	WNP			0.0233%	134					0.0233%	134	0.0000	0
			No T-AGOS 19 missions—Negative Action Report				No T-AGOS 19 missions—Negative Action Report		No T-AGOS 19 missions—Negative Action Report					

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Table 7. Post-mission quarterly and total annual estimates of the percentages of marine mammal stocks and the associated number of marine mammals in that stock affected by the one LFA sonar mission conducted by the USNS ABLE (T-AGOS 20) in the northwestern Pacific Ocean during the LOA reporting period from August 2014 to August 2015. ESA-listed marine mammals highlighted.

Marine Mammal Species/Species Groups	Number Animals in Stock	Stock Name	120 to 180 dB										≥180 dB (with Mitigation)	
			Quarter 1 (August to November)		Quarter 2 (November to February)		Quarter 3 (February to May)		Quarter 4 (May to August)		Total Annual		Total for Quarter and Annual	
			Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected
Mysticetes														
Blue whale	9,250	CNP	0.0004%	1							0.0004%	1	0.0000%	0
Bryde's whale	20,501	WNP	0.0157%	3							0.0157%	3	0.0000%	0
Common minke whale	25,049	WNP "O"	0.0407%	11							0.0407%	11	0.0000%	0
Humpback whale	1,107	WNP	0.1853%	3							0.1853%	3	0.0000%	0
Odontocetes														
Blainville's beaked whale	8,032	WNP	0.0153%	2							0.0153%	2	0.0000%	0
Common bottlenose dolphin	168,791	WNP Offshore	0.0204%	35							0.0204%	35	0.0000%	0
Cuvier's beaked whale	90,725	WNP	0.0008%	1							0.0008%	1	0.0000%	0
False killer whale	16,668	WNP Pelagic	0.0396%	7							0.0396%	7	0.0000%	0
Fraser's dolphin	220,789	WNP	0.0052%	12							0.0052%	12	0.0000%	0
Ginkgo-toothed beaked whale	22,799	NP	0.0054%	2							0.0054%	2	0.0000%	0
Killer whale	12,256	WNP	0.0026%	1							0.0026%	1	0.0000%	0
Kogia spp.	350,553	WNP	0.0017%	6							0.0017%	6	0.0000%	0
Longman's beaked whale	1,007	WNP	0.0756%	1							0.0756%	1	0.0000%	0
Melon-headed whale	36,770	WNP	0.0265%	10							0.0265%	10	0.0000%	0
Pantropical spotted dolphin	438,064	WNP	0.0067%	30							0.0067%	30	0.0000%	0
Pygmy killer whale	30,214	WNP	0.0158%	5							0.0158%	5	0.0000%	0
Risso's dolphin	83,289	WNP	0.0386%	33							0.0386%	33	0.0000%	0
Rough-toothed dolphin	145,729	WNP	0.0153%	23							0.0153%	23	0.0000%	0
Short-finned pilot whale	53,608	WNP	0.0468%	26							0.0468%	26	0.0000%	0
Sperm whale	102,112	NP	0.0029%	4							0.0029%	4	0.0000%	0
Spinner dolphin	1,015,059	WNP	0.0002%	2							0.0002%	2	0.0000%	0
Striped dolphin	570,038	WNP	0.0062%	36							0.0062%	36	0.0000%	0
					No T-AGOS 20 missions—Negative Action Report		No T-AGOS 20 missions—Negative Action Report		No T-AGOS 20 missions—Negative Action Report					

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Table 8. Post-mission quarterly and total annual estimates of the percentages of marine mammal stocks and the associated number of marine mammals in that stock affected by the six LFA sonar missions conducted by the USNS EFFECTIVE (T-AGOS 21) in the northwestern Pacific Ocean during the LOA reporting period from August 2014 to August 2015. ESA-listed marine mammals highlighted.

Marine Mammal Species/Species Groups	Number Animals in Stock	Stock Name	120 to 180 dB											≥180 dB (with Mitigation)	
			Quarter 1 (August to November)		Quarter 2 (November to February)		Quarter 3 (February to May)		Quarter 4 (May to August)		Total Annual		Total for Quarter and Annual		
			Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	
Mysticetes															
Blue whale	9,250	CNP	0.0048%	2			0.0050%	2			0.0098%	4	0.0000%	0	
Bryde's whale	20,501	WNP	0.0855%	20			0.0511%	12	0.0172%	5	0.1537%	37	0.0000%	0	
Common minke whale	25,049	WNP "O"	0.0574%	15			0.4402%	111	0.0635%	16	0.5611%	142	0.0000%	0	
Common minke whale	893	WNP "J"							0.9712%	9	0.9712%	9	0.0000%	0	
Fin whale	9,250	WNP	0.0047%	1			0.1014%	11	0.0131%	2	0.1191%	14	0.0000%	0	
Humpback whale	1,107	WNP	0.1457%	3			3.6879%	42			3.8337%	45	0.0000%	0	
North Pacific right whale	922	WNP					0.0058%	1	0.0148%	1	0.0206%	2	0.0000%	0	
Sei whale	8,600	NP	0.1401%	13							0.1401%	13	0.0000%	0	
Western North Pacific Gray whale	121	WNP							0.1143%	1	0.1143%	1	0.0000%	0	
Odontocetes															
Blainville's beaked whale	8,032	WNP	0.6041%	50			0.0653%	6	0.0290%	3	0.6984%	59	0.0000%	0	
Common bottlenose dolphin	168,791	WNP Offshore	0.0368%	63			0.0650%	110			0.1018%	173	0.0000%	0	
Common bottlenose dolphin	105,138	IA							0.0016%	2	0.0016%	2	0.0000%	0	
Cuvier's beaked whale	90,725	WNP	0.2825%	258			0.0569%	53	0.0015%	2	0.3409%	313	0.0000%	0	
Dwarf sperm whale	350,553	WNP	0.0867%	304							0.0867%	304	0.0000%	0	
False killer whale	16,668	WNP Pelagic	0.2694%	45			0.2446%	42			0.5140%	87	0.0000%	0	
False killer whale	9,777	IA							0.0694%	7	0.0694%	7	0.0000%	0	
Fraser's dolphin	10,226	CNP	1.7309%	177							1.7309%	177	0.0000%	0	
Fraser's dolphin	220,789	WNP	0.0008%	2			0.0476%	106	0.0099%	22	0.0584%	130	0.0000%	0	
Ginkgo-toothed beaked whale	22,799	NP	0.1693%	40			0.0230%	6	0.0102%	3	0.2025%	49	0.0000%	0	
Killer whale	12,256	WNP	0.0474%	7			0.0112%	3	0.0099%	2	0.0686%	12	0.0000%	0	
Kogia spp.	350,553	WNP					0.0288%	102	0.0032%	12	0.0321%	114	0.0000%	0	
Longman's beaked whale	1,007	WNP	1.6935%	17			0.2846%	4	0.3393%	4	2.3174%	25	0.0000%	0	
Melon-headed whale	36,770	WNP	0.0039%	2			0.1636%	61	0.0712%	27	0.2388%	90	0.0000%	0	
Melon-headed whale	2,450	NMI	0.4605%	170							0.4605%	170	0.0000%	0	
Pacific white-sided dolphin	931,000	WNP					0.0187%	174			0.0187%	174	0.0000%	0	
Pantropical spotted dolphin	438,064	WNP	0.2281%	1,000			0.0472%	208			0.2753%	1,208	0.0000%	0	
Pantropical spotted dolphin	219,032	IA							0.0239%	53	0.0239%	53	0.0000%	0	
Pygmy killer whale	30,214	WNP	0.0207%	7			0.0977%	31	0.0028%	1	0.1212%	39	0.0000%	0	
Pygmy sperm whale	350,553	WNP	0.0353%	124							0.0353%	124	0.0000%	0	
Risso's dolphin	83,289	WNP	0.0555%	47			0.3707%	310			0.4262%	357	0.0000%	0	
Risso's dolphin	83,289	IA							0.0769%	65	0.0769%	65	0.0000%	0	
Rough-toothed dolphin	145,729	WNP	0.0972%	143			0.1233%	181	0.0153%	23	0.2359%	347	0.0000%	0	
Short-beaked common dolphins	3,286,163	WNP					0.0178%	585			0.0178%	585	0.0000%	0	
Short-finned pilot whale	53,608	WNP	0.3278%	176			0.5542%	298	0.0154%	9	0.8973%	483	0.0000%	0	
Sperm whale	102,112	NP	0.0546%	57			0.0214%	23	0.0046%	5	0.0806%	85	0.0000%	0	
Spinner dolphin	1,015,059	WNP	0.0036%	38			0.0012%	14	0.0003%	4	0.0052%	56	0.0000%	0	
Striped dolphin	570,038	IA							0.0039%	23	0.0039%	23	0.0000%	0	
Striped dolphin	570,038	WNP	0.0485%	278			0.0855%	488			0.1339%	766	0.0000%	0	
					No T-AGOS 21 missions—Negative Action Report										

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Table 9. Post-mission quarterly and total annual estimates of the percentages of marine mammal stocks and the associated number of marine mammals in that stock affected by the two LFA sonar missions conducted by the USNS IMPECCABLE (T-AGOS 23) in the northwestern Pacific Ocean during the LOA reporting period from August 2014 to August 2015. ESA-listed marine mammals highlighted.

Marine Mammal Species/Species Groups	Number Animals in Stock	Stock Name	120 to 180 dB										≥180 dB (with Mitigation)	
			Quarter 1 (August to November)		Quarter 2 (November to February)		Quarter 3 (February to May)		Quarter 4 (May to August)		Total Annual		Total for Quarter and Annual	
			Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected	Percent Stock Affected	Number Animals Affected
Mysticetes														
Bryde's whale	20,501	WNP							0.1592%	35	0.1592%	35	0.0000%	0
Common minke whale	25,049	WNP "O"							0.2711%	68	0.2711%	68	0.0000%	0
Odontocetes														
Blainville's beaked whale	8,032	WNP							0.1003%	9	0.1003%	9	0.0000%	0
Common bottlenose dolphin	168,791	WNP Offshore							0.1531%	259	0.1531%	259	0.0000%	0
Cuvier's beaked whale	90,725	WNP							0.0959%	88	0.0959%	88	0.0000%	0
False killer whale	16,668	WNP Pelagic							0.2622%	44	0.2622%	44	0.0000%	0
Fraser's dolphin	220,789	WNP							0.0294%	66	0.0294%	66	0.0000%	0
Ginkgo-toothed beaked whale	22,799	NP							0.0353%	9	0.0353%	9	0.0000%	0
Killer whale	12,256	WNP							0.0122%	2	0.0122%	2	0.0000%	0
Kogia spp.	350,553	WNP							0.0170%	60	0.0170%	60	0.0000%	0
Longman's beaked whale	1,007	WNP							0.4001%	5	0.4001%	5	0.0000%	0
Melon-headed whale	36,770	WNP							0.1754%	65	0.1754%	65	0.0000%	0
Pantropical spotted dolphin	438,064	WNP							0.0477%	210	0.0477%	210	0.0000%	0
Pygmy killer whale	30,214	WNP							0.1047%	32	0.1047%	32	0.0000%	0
Risso's dolphin	83,289	WNP							0.2510%	210	0.2510%	210	0.0000%	0
Rough-toothed dolphin	145,729	WNP							0.0906%	133	0.0906%	133	0.0000%	0
Short-beaked common dolphins	3,286,163	WNP							0.0257%	846	0.0257%	846	0.0000%	0
Short-finned pilot whale	53,608	WNP							0.4162%	224	0.4162%	224	0.0000%	0
Sperm whale	102,112	NP							0.0184%	19	0.0184%	19	0.0000%	0
Spinner dolphin	1,015,059	WNP							0.0012%	13	0.0012%	13	0.0000%	0
Striped dolphin	570,038	WNP							0.0881%	502	0.0881%	502	0.0000%	0
			No T-AGOS 23 missions—Negative Action Report		No T-AGOS 23 missions—Negative Action Report		No T-AGOS 23 missions—Negative Action Report							

Rule (77 FR 50290) (NOAA, 2012). In addition, no marine mammal stranding events associated with the times and locations of SURTASS LFA sonar missions were reported during this annual LOA period. Last, no apparent avoidance reactions or acute effects to threatened or endangered species were observed in response to exposure from SURTASS LFA sonar transmissions.

7 SUMMARY OF MONITORING AND REPORTING FOR LOA PERIOD AUGUST 2014 TO AUGUST 2015

7.1 2014 TO 2015 STATUS ON POTENTIAL RESEARCH ON THE EFFECTS OF SURTASS LFA SONAR ON BEAKED WHALES AND/OR HARBOR PORPOISES

7.1.1 EXECUTIVE OVERSIGHT GROUP (EOG)

Following the submittal of the SAG report, in 2014, the Navy twice convened the EOG, composed of Navy and NMFS personnel and representatives of the Marine Mammal Commission. The purpose of the EOG is to provide the Navy with: 1) independent, objective review of the SAG's findings, 2) research guidance and prioritization, and 3) final recommendations to the Navy and NMFS on research efforts to ascertain effects of exposure to SURTASS LFA sonar specifically targeting beaked whale species and harbor porpoises. The members of the EOG have additionally recommended additional lower-cost research and monitoring studies based on existing occurrence and underwater acoustic vocalization data. The EOG is in the process of ranking the research and monitoring efforts and will assist the Navy in providing NMFS with a report of the recommendations along with a strategic approach to implementing the research/monitoring initiatives given the limited research funding available.

7.2 STRANDING INCIDENT MONITORING

As required by LOA Condition 13(c), the Navy monitors and reviews information on marine mammal strandings from the media as well as federal, state, and international organizations. During the 2014 to 2015 LOA period, several marine mammal strandings occurred near western North Pacific Ocean mission areas for SURTASS LFA sonar. On March 23, 2015, a Cuvier's beaked whale dead stranded in the Merizo area of southern Guam in the Mariana Islands (Toves, 2015). Later, about July 26, 2015, another beaked whale (species not reported) dead-stranded in Guam at Agat Marina (Romanes, 2015). No SURTASS LFA sonar operations occurred either spatially or temporally in association with either Guam beaked whale stranding.

A mass stranding of 150 melon-headed whales occurred during the early morning hours of April 10, 2015 along the Hokkaido, Ibaraki prefecture coast of eastern (Pacific) Japan. Most of the animals were alive when they stranded and were rescued and returned to the ocean, but a number died during the stranding. No SURTASS LFA sonar operations occurred either spatially or temporally in relation to this mass stranding event.

Additionally, several individual strandings of primarily dolphins but also one sperm whale and melon-headed whale occurred in the Hawaiian Islands in the 2014 to 2015 LOA effective period, but no SURTASS LFA sonar operations occurred in Hawaiian waters during this period. Further, no dead, injured, or stranded marine mammals were observed or detected at sea by any of the SURTASS LFA sonar vessels during their annual missions. From the commencement of SURTASS LFA sonar use from 2002 through the present, neither LFA sonar nor operation of T-AGOS vessels has been associated with any mass or individual strandings of marine mammals.

7.3 PASSIVE ACOUSTIC DATA

The Navy continues to discuss internally declassifying and sharing some portion of classified data collected by the M3 program and the Navy's underwater passive acoustic systems with scientists with the appropriate security credentials, per LOA Condition 12(b). Progress has been achieved on addressing security concerns and declassifying the results of a specific dataset pertinent to a current area of scientific

inquiry for which a peer-reviewed scientific paper is being prepared for submission to a scientific journal. Further details will be provided as the internal process develops.

7.4 AUGMENTING MARINE MAMMAL MONITORING WITH SURTASS PASSIVE SONAR

As LOA Condition 12(c) requires, the Navy continues to review the feasibility of using SURTASS passive sonar arrays to augment marine mammal monitoring capabilities during Navy Range activities or other exercises. Presently, there are no near-term opportunities foreseen in which a SURTASS LFA vessel would be available to augment the collection of data on marine mammal vocalizations before, during, or after designated exercises; particularly those occurring within Navy range complexes. Considerable constraints are entailed in using the SURTASS passive sonar array to participate in Navy Range or joint exercises. These constraints include the sizeable lead time required in the operational planning process to involve any of the SURTASS LFA sonar vessels in a joint or Range exercise and the length of time, and associated considerable operational costs, required to transit one of the vessels to a Navy Range Complex or joint exercise area due to the low speeds at which the SURTASS LFA vessels are only capable of traveling. However, planning discussions are ongoing about potential future opportunities to utilize SURTASS as part of Range testing and/or training activities.

7.5 AMBIENT NOISE DATA

Ambient underwater noise data have been collected by Navy passive acoustic assets, are processed, and archived. Due to national security concerns, use of these data is currently for official use only. In accordance with LOA Condition 12(d), the Navy continues to study the feasibility of declassifying portions of these data after all related security concerns have been resolved. The M3 program is working to compile information on the ambient noise data that have been collected from various systems as a starting point for further discussions on data dissemination, either at a classified or unclassified level.

7.6 MITIGATION EFFECTIVENESS

LOA Condition 13(f)(iii) requires an analysis of the effectiveness of the mitigation measures associated with the authorized operation of SURTASS LFA sonar with recommendations for improvement where applicable. During SURTASS LFA sonar transmissions, the radial distance of the LFA mitigation zone, or the distance to the 180-dB isopleth, was predictably about 1 km (0.54 nmi), which in combination with the 1-km (0.54 nmi) buffer zone, resulted in an approximate 2-km (1.08-nmi) monitoring radius around the LFA sonar vessels. This distance did vary through the annual period with the varying oceanographic and environmental conditions of the mission areas in which LFA sonar operations were conducted.

The implementation of the required mitigation measures to minimize to the greatest extent practicable adverse impacts to marine mammals proved to be very effective during the 2014 to 2015 LOA period. Two trainings of visual observers were conducted in accordance with Condition 9(a)(i) of the LOAs, and visual observers were posted as specified in LOA Condition 9(a)(iii) and CNO executive directive during LFA sonar transmissions. During the ten 2014 to 2015 LFA sonar missions, six visual detections of whales, dolphins, a sea turtle, and two schools of tuna resulted from efforts of the civilian lookouts onboard the SURTASS LFA sonar vessels.

The embarked MILCREW and system engineers monitored the SURTASS passive sonar system for marine mammal vocalizations as specified in LOA Condition 9(b) and were additionally trained in the distinction between biological and mission-directed sounds. Although no passive acoustic detections occurred in the LFA mitigation/buffer zones during any of the 10 missions, 29 passive acoustic detections of Bryde's, fin, and humpback whale vocalizations were identified from ranges beyond the mitigation/buffer zone. This large number of passive acoustic detections proves the capability of the SURTASS passive system to detect marine mammal vocalizations when present in the ambient environment and of the Navy's MILCREW to identify the detected signals to marine mammal species,

providing important biological information on the distribution of these species in the northwestern Pacific Ocean.

The HF/M3 sonar systems were operated continuously during LFA sonar transmissions in accordance with MMPA Final Rule requirements and LOA Conditions 8(e) and 9(c) (Appendix A). Seven active acoustic (HF/M3 sonar) detections were reported during the missions of the four SURTASS LFA sonar vessels during the 2014 to 2015 LOA period. Per the mitigation protocol and in conjunction with the six visual sightings, the seven HF/M3 detections resulted in 11 suspensions/delays of LFA sonar transmissions during the 10 LFA sonar missions.

During the LOA reporting period from 15 August 2014 through 14 August 2015, all mitigation measure and monitoring required by the LOAs, MMPA Final Rule, and CNO directives were strictly adhered to and conducted in accordance with the protocols specified in those requirements. In examining the results of the mitigation monitoring procedures during this annual LOA reporting period, in addition to the results of the previous twelve years of SURTASS LFA sonar operations, the Navy has concluded that the mitigation measures/mitigation monitoring have been implemented properly, and accordingly, have successfully minimized the potential effects of SURTASS LFA sonar to marine mammals to greatest extent practicable. This conclusion is supported by documentation that no known mortality or injury to marine mammals stocks have occurred over this period. The Navy will continue its commitment to training the crews of the SURTASS LFA sonar vessels in the proper and effective implementation of the mitigation protocols.

7.7 ASSESSMENT OF LONG-TERM EFFECTS AND ESTIMATED CUMULATIVE IMPACTS

Since the incidental harassments that occurred during this LOA reporting period are consistent but lower than those predicted in the relevant NEPA documentation on SURTASS LFA Sonar (i.e., the 2012 DoN FSEIS/SOEIS) and supporting documentation, the Navy's assessment of the long-term effects and estimated cumulative impacts from employment of SURTASS LFA sonar over this LOA reporting period has not changed and remains consistent with earlier findings. The four SURTASS LFA sonar systems do not add appreciably to the underwater sounds to which marine mammal stocks are exposed, no evidence exists indicating that SURTASS LFA sonar transmissions have caused mortality or injury to marine mammals, and the cumulative effects from the operation of up to four SURTASS LFA sonar systems are not a reasonably foreseeable significant adverse impact on marine mammals.

7.8 ADAPTIVE MANAGEMENT

Since the understanding of the potential effects of SURTASS LFA sonar on marine mammals is continuing to evolve, the MMPA Final Rule (NOAA, 2012) provided the adaptive management mechanism by which NMFS can modify or augment existing mitigation or monitoring measures, after consultation with the Navy, if doing so will have a reasonable likelihood of more effectively accomplishing the mitigation and monitoring objectives (50 CFR 218.241). The Navy and NMFS held two Adaptive Management meetings for the SURTASS LFA sonar program during the 2014 to 2015 LOA period; the first meeting was held on 4 December 2014 and second was held on 16 April 2015. Representatives from NMFS Office of Protected Resources and General Council (GC); Navy CNO (N2/N6F24 and Environmental Readiness Division); Navy GC and Judge Advocate General; Navy Deputy Assistant Secretary of the Navy, Environment (DASN(E)); support contractors; and the Marine Mammal Commission attended the meetings. The December 2014 meeting included an overview of the Navy's quarterly monitoring reports and incidental harassments associated with the SURTASS LFA sonar missions, status of monitoring and reporting requirements, recent relevant scientific literature, discussion of possible OBIAs, and pertinent marine mammal stranding events. The April 2015 meeting focused primarily on review of potential areas for OBIA consideration. As a result of the April meeting, the Navy conducted a spatial analysis of the newly identified and potential geographic areas for OBIA consideration.

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APPENDIX A:

EXEMPLAR⁸ LETTER OF AUTHORIZATION (LOA) GOVERNING THE
TAKING OF MARINE MAMMALS INCIDENTAL TO THE U.S. NAVY'S
OPERATION OF SURVEILLANCE TOWED ARRAY SENSOR SYSTEM LOW
FREQUENCY ACTIVE (SURTASS LFA) SONAR ONBOARD THE USNS
VICTORIOUS (T-AGOS 19), AUGUST 15, 2014 THROUGH AUGUST 14,
2015

8 Only the LOA for the USNS VICTORIOUS (T-AGOS 19) is included herein. The LOAs for the USNS ABLE, USNS EFFECTIVE, and USNS IMPECCABLE are exactly the same as the LOA for the VICTORIOUS, with only the ship's names changing in the individual LOAs.



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

DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

LETTER OF AUTHORIZATION

The Chief of Naval Operations, Department of the Navy, 2000 Navy Pentagon, Washington, D.C. 20350-2000, and individuals operating under his authority (i.e., Navy), are authorized to take marine mammals incidental to Navy operations of Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar in accordance with 50 CFR Part 218, Subpart X- Taking of Marine Mammals Incidental to Navy Operations of Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) sonar subject to the provisions of the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*; MMPA) and the following conditions:

1. This Authorization is valid for the period August 15, 2014, through August 14, 2015.
2. This Authorization is valid only for the unintentional taking of the species of marine mammals identified in 50 CFR § 218.230(b) and Condition 5 of this Authorization incidental to the activity specified in Condition 3. This Authorization shall be valid only for take consistent with the provisions in 50 CFR § 218.232 and the terms of this Authorization.
3. This Authorization is valid only for activities associated with the routine training, testing, and military operations of the SURTASS LFA sonar onboard the United States Naval Ship (USNS) VICTORIOUS (T-AGOS 19). The sound signals transmitted by the SURTASS LFA sonar source must be between 100 and 500 Hertz (Hz) with a source level for each of the 18 projectors at no more than 215 decibels (dB) re: 1 micro Pascal (μPa) at 1 meter (m) (root mean square (rms)) and a maximum duty cycle of 20 percent.
4. This Authorization, combined with Authorizations for the USNS ABLE (T-AGOS 20), USNS EFFECTIVE (T-AGOS 21), and USNS IMPECCABLE (T-AGOS 23), is valid for an estimated total of 20 nominal active sonar missions among the four SURTASS LFA sonar vessels (or equivalent number of shorter missions but shall not exceed a total of 432 hours of sonar transmit time per vessel during the period of this Authorization's effectiveness) within the following areas:
 - (a) Up to 16 nominal missions in the northwestern Pacific Ocean, which includes the following mission areas: east of Japan; the North Philippine Sea; the west Philippine Sea; offshore Guam; the Sea of Japan; the East China Sea; the South China Sea; and offshore Japan (25° to 40° N and 10° to 25° N).



- (b) Up to 4 nominal missions in the north-central Pacific Ocean that includes the Hawaii North and Hawaii South mission areas.

SPECIES AUTHORIZED AND LEVEL OF TAKE

5. The incidental take of marine mammals under the activity identified in Conditions 3 and 4 of this Authorization is limited to the following species:
 - (a) **Mysticetes:** blue whale (*Balaenoptera musculus*), Bryde's whale (*Balaenoptera edeni*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), common minke whale (*Balaenoptera acutorostrata*), north Pacific right whale (*Eubalena japonica*), sei whale (*Balaenoptera borealis*), and Western North Pacific gray whale (*Eschrichtius robustus*).
 - (b) **Odontocetes:** Baird's beaked whale (*Berardius bairdii*), Blainville's beaked whale (*Mesoplodon densirostris*), common bottlenose dolphin (*Tursiops truncatus*), Cuvier's beaked whale (*Ziphius cavirostris*), Dall's porpoise (*Phocoenoides dalli*), dwarf sperm whale (*Kogia simus*), false killer whale (*Pseudorca crassidens*), Fraser's dolphin (*Lagenodelphis hosei*), ginkgo-toothed beaked whale (*Mesoplodon ginkgodens*), Hubbs' beaked whale (*Mesoplodon carhubbsi*), killer whale (*Orca orcinus*), *Kogia* spp., Longman's beaked whale (*Indopacetus pacificus*), melon-headed whale (*Peponocephala electra*), *Mesoplodon* spp., Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), pantropical spotted dolphin (*Stenella attenuata*), pygmy killer whale (*Feresa attenuata*), pygmy sperm whales (*K. breviceps*), Risso's dolphin (*Grampus griseus*), rough-toothed dolphin (*Steno bredanensis*), short-beaked common dolphin (*Delphinus delphis*), short-finned pilot whale (*Globicephala macrorhynchus*), sperm whale (*Physeter macrocephalus*), spinner dolphin (*Stenella longirostris*), Stejneger's beaked whale (*Mesoplodon stejnegeri*), and striped dolphin (*Stenella coeruleoalba*).
 - (c) **Pinnipeds:** Hawaiian monk seal (*Monachus shauinslandi*)
6. The taking of marine mammals by the Holder of this Authorization is limited to the incidental taking of marine mammal species identified in Condition 5 by Level A and Level B harassment (as defined in the MMPA and 50 CFR § 216.3) within those areas authorized under Condition 4. The take, by Level B harassment, that occurs during the year covered by this Authorization may not exceed 12 percent of any marine mammal stock listed in Condition 5 (see Condition 8j).
7. Taking of marine mammal species not listed under Condition 5 by harassment, injury, or mortality or the taking by mortality of any marine mammal species listed under Condition 5 is prohibited.

MITIGATION

8. The Holder of this Authorization, and any individuals operating under his authority, must conduct the activity identified in 50 CFR § 218.230 and Condition 3 of this Authorization in a manner that minimizes, to the greatest extent practicable, adverse impacts on marine mammals, their habitats, and the availability of marine mammals for subsistence uses. When

conducting operations identified in 50 CFR § 218.230, the following mitigation measures must be implemented:

- (a) The Holder of this Authorization, and any individuals operating under his authority, must not broadcast the SURTASS LFA sonar signal at a frequency greater than 500 Hz.
- (b) Through mitigation described under 50 CFR § 218.234 and Condition 9 (Mitigation Monitoring) of this Authorization, the Holder of this Authorization and any individuals operating under his authority must ensure, to the greatest extent practicable, that no marine mammal is subjected to a sound pressure level of 180 dB re: 1 μ Pa (rms) or greater.
- (c) **LFA Sonar Mitigation Zone:** Prior to commencing and during SURTASS LFA sonar transmissions, the Holder of this Authorization will use near real-time environmental data and underwater acoustic prediction models to determine the propagation of the SURTASS LFA sonar signals in the mission area. The Holder must determine the distance from the SURTASS LFA sonar source to the 180-dB re: 1 μ Pa isopleth (rms) (*i.e.*, the LFA sonar mitigation zone) to comply with Condition 8(b).
 - (i) The Holder will update these sound field estimates every 12 hours or more frequently when meteorological or oceanographic conditions change.
- (d) **Additional 1-Kilometer (km) Buffer Zone:** The Holder of this Authorization will establish a 1-km buffer zone around the LFA sonar mitigation zone.
- (e) **Ramp-Up Procedures for the HF/M3 System:** The Holder of this Letter of Authorization and any individuals operating under his authority, will ramp up the High Frequency / Marine Mammal Monitoring (HF/M3) active sonar referenced in 50 CFR § 218.234 from a power level beginning at a maximum source sound pressure level of 180 dB re: 1 μ Pa (rms) in 10-dB increments to operating levels over a period of no less than five minutes:
 - (i) At least 30 minutes prior to any SURTASS LFA sonar transmission;
 - (ii) Prior to any SURTASS LFA sonar calibrations or testing that are not part of regular SURTASS LFA sonar transmissions described in 50 CFR § 218.230; and
 - (iii) Anytime after individuals have powered down the HF/M3 active sonar source for more than two minutes.
 - (iv) Once HF/M3 operators detect a marine mammal, they will not increase the HF/M3 active sonar system's sound pressure level. Resumption of the ramp-up of HF/M3 sonar system may not occur until marine mammals are no longer detected by the HF/M3 active sonar system, passive acoustic monitoring, or visual monitoring described in Condition 9.
- (f) **Suspension/Delay for SURTASS LFA Sonar Transmissions:** If the Holder of this Authorization, and any individuals operating under his authority, detects a marine mammal through monitoring required under 50 CFR § 218.235 and Condition 9 within either the LFA sonar mitigation zone or the 1-km buffer zone, the Holder will immediately suspend or delay SURTASS LFA sonar transmissions.

(g) **Resumption of SURTASS LFA Sonar Transmissions:** The Holder of this Authorization and any individuals operating under his authority may resume/commence SURTASS LFA sonar transmissions 15 minutes after:

- (i) All marine mammals have left the area of the LFA sonar mitigation zone and the 1-km buffer zone; and/or
- (ii) There is no further detection of any marine mammal within the LFA sonar mitigation zone plus the 1-km buffer zone as determined by the passive or active acoustic or visual monitoring protocols described in 50 CFR § 218.235 and Condition 9.

(h) **Geographic Restrictions:** The Holder of this Authorization and any individuals operating under his authority will not operate SURTASS LFA sonar such that the SURTASS LFA sonar sound field exceeds 180 dB re: 1 μ Pa (rms):

- (i) At a distance of less than or equal to 22 km (14 miles (mi); 12 nautical miles (nmi)) from any coastline, including offshore islands.
- (ii) At a distance of less than or equal to 1 km (0.62 mi; 0.54 nmi) seaward of the outer perimeter of any Offshore Biologically Important Area (OBIA) for marine mammals designated in 50 CFR § 218.234(f)(2) and described in Condition 8(h)(iii) during the period specified.
- (iii) The OBIAs for marine mammals (with specified periods) for SURTASS LFA sonar routine training, testing, and military operations are:

OBIA	Period of Effectiveness
Georges Bank	Year-round
Roseway Basin Right Whale Conservation Area	June through December, annually
Great South Channel, U.S. Gulf of Maine, and Stellwagen Bank National Marine Sanctuary (NMS)	January 1 to November 14, annually
Southeastern U.S. Right Whale Seasonal Habitat	November 15 to April 15, annually
North Pacific Right Whale Critical Habitat	March through August, annually
Silver Bank and Navidad Bank	December through April, annually
Coastal waters of Gabon, Congo and Equatorial Guinea	June through October, annually
Patagonian Shelf Break	Year-round
Southern Right Whale Seasonal Habitat	May through December, annually
Central California NMSs	June through November, annually
Antarctic Convergence Zone	October through March, annually
Piltun and Chayvo offshore feeding grounds in the Sea of Okhotsk	June through November, annually

Coastal waters off Madagascar	July through September, annually for humpback whale breeding and November through December, annually for migrating blue whales.
Madagascar Plateau, Madagascar Ridge, and Walters Shoal	November through December, annually
Ligurian-Corsican-Provencal Basin and Western Pelagos Sanctuary in the Mediterranean Sea	July to August, annually
Hawaiian Islands Humpback Whale NMS and Penguin Bank	November through April, annually
Costa Rica Dome	Year-round
Great Barrier Reef Between 16° S and 21° S	May through September, annually
Bonney Upwelling on the southern coast of Australia	December through May, annually
Northern Bay of Bengal and Head of Swatch-of-No-Ground	Year-round
Olympic Coast NMS and Prairie, Barkley Canyon, and Nitnat Canyon	Olympic NMS: December, January, March, and May, annually The Prairie, Barkley Canyon, and Nitnat Canyon: June through September, annually
Abrolhos Bank	August through November

Note: See § 218.234(f)(2) and Attachment 1 for geographic coordinate information.

- (i) **Operational Exception for SURTASS LFA Sound Field in OBIA's:** During military operations, SURTASS LFA sonar transmissions may exceed 180 dB re: 1 μ Pa (rms) within the boundaries of an OBIA, including operating within an OBIA, when the Holder of this Authorization determines that it is: 1) operationally necessary to continue tracking an existing underwater contact; or 2) operationally necessary to detect a new underwater contact within the OBIA. This exception does not apply to routine training and testing with the SURTASS LFA sonar systems.
- (j) **Mission Planning:** The Holder of this Authorization must maintain a running calculation/estimation of takes of each species and stocks over the effective period of these regulations. The Holder of this Authorization will plan all SURTASS LFA sonar missions to ensure that no more than 12 percent of any marine mammal stock of a species listed in 50 CFR § 218.230(b)(1) through (3) would be taken by Level B harassment annually. This annual per-stock cap of 12 percent applies regardless of the number of LFA sonar vessels operating. The Holder of this Authorization must coordinate with the Holder of the Letters of Authorization issued to the USNS ABLE, USNS EFFECTIVE, and the USNS IMPECCABLE, to ensure that this condition is met for all vessels combined.

MITIGATION MONITORING

9. The Holder of this Authorization, and any individuals operating under his authority, must:

(a) Perform the following for visual mitigation monitoring:

- (i) Marine mammal biologists qualified in conducting at-sea marine mammal visual monitoring from surface vessels will train and qualify designated ship personnel as lookouts to conduct at-sea visual monitoring.
- (ii) Marine mammal biologists will train the lookouts in the most effective means to ensure quick and effective communication within the command structure to facilitate implementation of protective measures if they observe marine mammals.
- (iii) Conduct visual monitoring from the ship's bridge during daylight hours (30 minutes before sunrise until 30 minutes after sunset) during operations that employ SURTASS LFA sonar in the active mode. Maintain a topside watch with standard binoculars (7x) and with the naked eye.

(b) Perform the following for passive acoustic monitoring:

- (i) Use the low frequency, passive SURTASS sonar system to listen for vocalizing marine mammals.

(c) Perform the following for active acoustic monitoring:

- (i) Use the HF/M3 active sonar to locate and track marine mammals in relation to the SURTASS LFA sonar vessel and the sound field produced by the SURTASS LFA sonar source array, subject to the ramp-up requirements in § 218.234(e) and Condition 8(e).

10. Mitigation monitoring under Conditions 9(a), (b), and (c) must:

- (a) Commence at least 30 minutes before the first SURTASS LFA sonar transmission (30 minutes before sunrise for visual monitoring);
- (b) Continue between sonar transmissions (pings); and
- (c) Continue either at least 15 minutes after completion of the SURTASS LFA sonar transmission exercise (30 minutes after sunset for visual monitoring) or if marine mammals are showing abnormal behavioral patterns, for a period of time until behavior patterns return to normal or conditions prevent continued observations.

MONITORING

11. The Holder of this Authorization and any individuals operating under his authority for activities described in 50 CFR § 218.230 must:

- (a) Cooperate with NMFS and any other federal agency for monitoring the impacts of the activity on marine mammals; and
- (b) Designate qualified on-site individuals to conduct the mitigation, monitoring, and

reporting activities specified in this Letter of Authorization.

12. The Holder of this Authorization and any individuals operating under his authority will conduct all monitoring required under the Letter of Authorization to increase knowledge of the affected marine mammal species. The Holder of this Authorization must:
- (a) Complete consideration of the Scientific Advisory Group's (SAG) final report on the different types of monitoring/research that could increase the understanding of the potential effects of SURTASS LFA sonar transmissions on beaked whales and/or harbor porpoises.
 - (b) Continue to assess data from the Marine Mammal Monitoring Program and work toward making some portion of that data, after appropriate security reviews, available to scientists with appropriate clearances. Any portions of the analyses conducted by these scientists based on these data that are determined to be unclassified after appropriate security reviews should be made publicly available.
 - (c) Continue to explore the feasibility of coordinating with other Navy fleet assets and/or range monitoring programs to include the use of SURTASS passive sonar (towed horizontal line arrays) to augment the collection of marine mammal vocalizations before, during, and after designated exercises.
 - (d) Continue to collect ambient noise data and explore the feasibility of declassifying and archiving the ambient noise data for incorporation into appropriate ocean noise budget efforts.

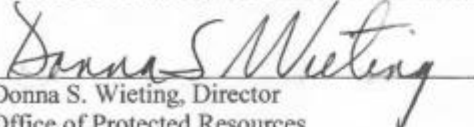
REPORTING

13. The Holder of this Authorization and any individuals operating under his authority must:
- (a) Provide a status update to NMFS when the Holder submits the next annual application on efforts to assess the data collected by from the Marine Mammal Monitoring Program and progress toward making some portion of that data, after appropriate security reviews, available to scientists with appropriate clearances.
 - (b) Draft a plan of action outlining a strategy for implementing the SAG's recommendations for going forward with beaked whales and/or harbor porpoise research; or describe in writing why such research is not feasible/or is unlikely to increase the understanding of the potential effects of LFA sonar transmissions on beaked whales and/or harbor porpoises, to be followed by a meeting with NMFS to discuss any other potential options.
 - (c) Systematically observe SURTASS LFA sonar operations for injured or disabled marine mammals and monitor the principal marine mammal stranding networks and other media to correlate analysis of any whale strandings that could potentially be associated with SURTASS LFA sonar operations. The Holder and any individuals operating under his authority shall:
 - (i) Ensure that NMFS is notified immediately or as soon as clearance procedures allow if an injured, stranded, or dead marine mammal is found during or shortly after, and in the vicinity of, any SURTASS LFA operations. The Holder will report the incident to the Incidental Take Program Supervisor, Permits and

Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by email to Jolie.Harrison@noaa.gov and Jeannine.Cody@noaa.gov.

- (ii) Provide NMFS with species or description of the animal(s), the condition of the animal(s) (including carcass condition if the animal is dead), location, time of first discovery, observed behaviors (if alive), and photo or video (if available).
 - (iii) In the event that an injured, stranded, or dead marine mammal is found by the Holder and any individuals operating under his authority, that is not in the vicinity of, or found during or shortly after SURTASS LFA sonar operations, the Holder and any individuals operating under his authority, will report the same information to NMFS as listed above as soon as operationally feasible and clearance procedures allow.
- (d) In the event of a ship strike by the SURTASS LFA sonar vessel, at any time or place, the Holder and any individuals operating under his authority, must:
- (i) Immediately, or as soon as clearance procedures allow, report to the NMFS the species identification (if known), location (lat/long) of the animal (or the strike if the animal has disappeared), and whether the animal is alive or dead (or unknown).
 - (ii) Report the incident to the Incidental Take Program Supervisor, Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by email to Jolie.Harrison@noaa.gov and Jeannine.Cody@noaa.gov.
 - (iii) Report to the NMFS as soon as operationally feasible the size and length of the animal, an estimate of the injury status (e.g., dead, injured but alive, injured and moving, unknown, etc.).
 - (iv) Report to the NMFS the vessel class/type and operational status, vessel length, speed, and vessel heading as soon as feasible.
 - (v) Provide the NMFS a photo or video of the struck animal, if equipment is available.
- (e) Submit classified and unclassified quarterly mission reports to the Director, Office of Protected Resources, NMFS no later than 30 days after the end of each quarter beginning on the date of effectiveness of a Letter of Authorization or as specified in the appropriate Letter of Authorization. Each quarterly mission report will include all active-mode missions completed during that quarter. At a minimum, each classified mission report must contain the following information:
- (i) Dates, times, and location of each vessel during each mission;
 - (ii) Information on sonar transmissions during each mission and records of any delays or suspensions;
 - (iii) Location of the SURTASS LFA sonar mitigation and buffer zones in relation to the LFA sonar array;

- (iv) Marine mammal observations including animal type and/or species, number of animals sighted, date and time of observations, type of detection (visual, passive acoustic, HF/M3 sonar), bearing and range from vessel, abnormal behavior (if any), and remarks/narrative (as necessary).
 - (v) The report will include the Navy's estimates of the percentages of marine mammal stocks affected (both for the quarter and cumulatively for the year covered by the Authorization) by SURTASS LFA sonar operations (both within and outside the LFA sonar mitigation zone), using predictive modeling based on operating locations, dates/times of operations, system characteristics, oceanographic environmental conditions, and animal demographics.
 - (vi) If no SURTASS LFA sonar missions are completed during a quarter, a report of negative activity will be provided.
- (f) Submit an annual, unclassified report to the Director, Office of Protected Resources, NMFS, no later than 45 days after expiration of this Authorization. At a minimum, the annual report will contain the following:
- (i) An unclassified summary of the year's quarterly reports;
 - (ii) The Navy's estimates of the percentages of marine mammal stocks affected by SURTASS LFA sonar operations (both within and outside the LFA sonar mitigation zone), using predictive modeling based on operating locations, dates/times of operations, system characteristics, oceanographic environmental conditions, and animal demographics.
 - (iii) An analysis of the effectiveness of the mitigation measures with recommendations for improvements, where applicable;
 - (iv) An assessment of any long-term effects from SURTASS LFA sonar operations; and
 - (v) Any discernible or estimated cumulative impacts from SURTASS LFA sonar operations.
14. The Holder of this Authorization must comply with the Terms and Conditions of the Incidental Take Statement corresponding to the Endangered Species Act Biological Opinion issued to the Navy and the National Marine Fisheries Service's Office of Protected Resources, Permits and Conservation Division.
15. A copy of this Authorization must be in the possession of the Officer in Charge of the Military Detachment (MILDET) onboard the USNS VICTORIOUS to conduct the activity under the authority of this Letter of Authorization and Incidental Take Statement.


 Donna S. Wieting, Director
 Office of Protected Resources
 National Marine Fisheries Service

AUG 13 2014

Date

Attachment 1 – Table 1 OBIA Coordinates

Name of Area	Location of Area	Months of Importance
Georges Bank	40°00'N, 72°30'W 39°37'N, 72°09'W 39°54'N, 71°43'W 40°02'N, 71°20'W 40°08'N, 71°01'W 40°04'N, 70°44'W 40°00'N, 69°24'W 40°16'N, 68°27'W 40°34'N, 67°13'W 41°00'N, 66°24'W 41°52'N, 65°47'W 42°20'N, 66°06'W 42°18'N, 67°23'W	Year-round
Roseway Basin Right Whale Conservation Area	43°05'N, 65°40'W 43°05'N, 65°03'W 42°45'N, 65°40'W 42°45'N, 65°03'W	June through December, annually
Great South Channel, U.S. Gulf of Maine, and Stellwagen Bank National Marine Sanctuary (NMS)	41°00.000'N, 69°05.000'W 42°09.000'N, 67°08.400'W 42°53.436'N, 67°43.873'W 44°12.541'N, 67°16.847'W 44°14.911'N, 67°08.936'W 44°21.538'N, 67°03.663'W 44°26.736'N, 67°09.596'W 44°16.805'N, 67°27.394'W 44°11.118'N, 67°56.398'W 43°59.240'N, 68°08.263'W 43°36.800'N, 68°46.496'W 43°33.925'N, 69°19.455'W 43°32.008'N, 69°44.504'W 43°21.922'N, 70°06.257'W 43°04.084'N, 70°21.418'W 42°51.982'N, 70°31.965'W 42°45.187'N, 70°23.396'W 42°39.068'N, 70°30.188'W 42°32.892'N, 70°35.873'W 42°07.748'N, 70°28.257'W 42°05.592'N, 70°02.136'W 42°03.664'N, 69°44.000'W 41°40.000'N, 69°45.000'W	January 1 to November 14, annually
Southeastern U.S. Right Whale Seasonal Habitat	Critical Habitat Boundaries are coastal waters between 31°15' N and 30°15'N from the coast out 15 nautical miles (nmi); and the coastal waters between 30°15' N and 28°00'N from the coast out 5 nmi (50 CFR §226.13(c)). OBIA Boundaries are coastal waters between 31°15'N and 30°15'N from 12 to 15 nmi.	November 15 to April 15, annually
North Pacific Right Whale Critical Habitat	57°03'N, 153°00'W 57°18'N, 151°30'W 57°00'N, 151°30'W 56°45'N, 153°00'W (50 CFR §226.215)	March through August, annually

Name of Area	Location of Area	Months of Importance
Silver Bank and Navidad Bank	<p>Silver Bank: 20° 38.899'N, 69° 23.640'W 20° 55.706'N, 69° 57.984'W 20° 25.221'N, 70° 00.387'W 20° 12.833'N, 69° 40.604'W 20° 13.918'N, 69° 31.518'W 20° 28.680'N, 69° 31.900'W</p> <p>Navidad Bank: 20° 15.596'N, 68° 47.967'W 20° 11.971'N, 68° 54.810'W 19° 52.514'N, 69° 00.443'W 19° 54.957'N, 68° 51.430'W 19° 51.513'N, 68° 41.399'W</p>	December through April, annually
Coastal waters of Gabon, Congo and Equatorial Guinea	An exclusion zone following the 500-m isobath extending from 3°31.055'N, 9°12.226'E in the north offshore of Malabo southward to 8°57.470'S, 12°55.873'E offshore of Luanda.	June through October, annually
Patagonian Shelf Break	Between 200- and 2,000-m isobaths and the following latitudes: 35°00'S, 39°00'S, 40°40'S, 42°30'S, 46°00'S, 48°50'S.	Year-round
Southern Right Whale Seasonal Habitat	Coastal waters between 42°00'S and 43°00'S from 12 to 15 nmi including the enclosed bays of Golfo Nuevo, Golfo San Jose, and San Matias. Golfos San Jose and San Nuevo are within 22 km (14 mi; 12 nmi) coastal exclusion zone.	May through December, annually
Central California National Marine Sanctuaries	Single stratum boundary created from the Cordell Bank (15 CFR 922.10), Gulf of the Farallones (15 CFR 922.80), and Monterey Bay (15 CFR 922.30) NMS legal boundaries. Monterey Bay NMS includes the Davidson Seamount Management Zone.	June through November, annually
Antarctic Convergence Zone	30°E to 80°E, 45°S 80°E to 150°E, 55°S 150°E to 50°W, 60°S 50°W to 30°E, 50°S	October through March, annually

Name of Area	Location of Area	Months of Importance
Piltun and Chayvo offshore feeding grounds in the Sea of Okhotsk	54°09.436'N, 143°47.408'E 54°09.436'N, 143°17.354'E 54°01.161'N, 143°17.354'E 53°53.580'N, 143°13.398'E 53°26.963'N, 143°28.230'E 53°07.013'N, 143°35.481'E 52°48.705'N, 143°38.447'E 52°32.077'N, 143°37.788'E 52°21.605'N, 143°34.163'E 52°09.470'N, 143°26.582'E 51°57.686'N, 143°30.208'E 51°36.033'N, 143°42.794'E 51°08.082'N, 143°51.301'E 51°08.082'N, 144°16.742'E 51°24.514'N, 144°11.139'E 51°48.116'N, 144°10.809'E 52°03.194'N, 144°20.363'E 52°23.235'N, 144°10.150'E 52°28.674'N, 144°12.787'E 52°42.523'N, 144°10.150'E 53°12.972'N, 143°55.648'E 53°18.505'N, 143°56.637'E 53°23.041'N, 143°53.011'E 53°28.250'N, 143°53.341'E 53°44.039'N, 143°49.056'E 53°53.207'N, 143°50.045'E 53°59.819'N, 143°48.067'E	June through November, annually
Coastal waters off Madagascar	16°03'55.04"S, 50°27'12.59"E 16°12'23.03"S, 51°03'37.38"E 24°30'45.06"S, 48°26'00.94"E 24°15'28.07"S, 47°46'51.16"E 22°18'00.74"S, 48°14'13.52"E 20°52'24.12"S, 48°43'13.49"E 19°22'33.24"S, 49°15'45.47"E 18°29'46.08"S, 49°37'32.25"E 17°38'27.89"S, 49°44'27.17"E 17°24'39.12"S, 49°39'17.03"E 17°19'35.34"S, 49°54'23.82"E 16°45'41.71"S, 50°15'56.35"E	July through September, annually for humpback whale breeding and November through December, annually for migrating blue whales.
Madagascar Plateau, Madagascar Ridge, and Walters Shoul	25°55'20.00"S, 44°05'15.45"E 25°46'31.36"S, 47°22'35.90"E 27°02'37.71"S, 48°03'31.08"E 35°13'51.37"S, 46°26'19.98"E 35°14'28.59"S, 42°35'49.20"E 31°36'57.96"S, 42°37'49.35"E 27°41'11.21"S, 44°30'11.01"E	November through December, annually

Name of Area	Location of Area	Months of Importance
Ligurian-Corsican-Provençal Basin and Western Pelagos Sanctuary in the Mediterranean Sea	42°50.271'N, 06°31.883'E 42°55.603'N, 06°43.418'E 43°04.374'N, 06°52.165'E 43°12.600'N, 07°10.440'E 43°21.720'N, 07°19.380'E 43°30.600'N, 07°32.220'E 43°33.900'N, 07°49.920'E 43°36.420'N, 08°05.580'E 43°42.600'N, 08°22.140'E 43°50.880'N, 08°34.500'E 43°58.560'N, 08°47.700'E 43°59.040'N, 08°56.040'E 43°57.047'N, 09°03.540'E 43°52.260'N, 09°08.520'E 43°47.580'N, 09°13.500'E 43°36.060'N, 09°16.620'E 43°28.440'N, 09°05.820'E 43°21.360'N, 09°02.100'E 43°16.020'N, 08°57.240'E 43°04.440'N, 08°47.580'E 42°54.900'N, 08°35.400'E 42°45.900'N, 08°27.540'E 42°36.060'N, 08°22.020'E 42°22.620'N, 08°15.849'E 42°07.202'N, 08°17.174'E 41°52.800'N, 08°15.720'E 41°39.780'N, 08°05.280'E 41°28.200'N, 08°51.600'E 42°57.060'N, 06°19.860'E	July to August, annually
Hawaiian Islands Humpback Whale NMS and Penguin Bank	21°10'02.179"N, 157°30'58.217"W 21°09'46.815"N, 157°30'22.367"W 21°06'39.882"N, 157°31'00.778"W 21°02'51.976"N, 157°30'30.049"W 20°59'52.725"N, 157°29'28.591"W 20°58'05.174"N, 157°27'35.919"W 20°55'49.456"N, 157°30'58.217"W 20°50'44.729"N, 157°42'42.418"W 20°51'02.654"N, 157°44'45.333"W 20°53'56.784"N, 157°46'04.716"W 20°56'32.988"N, 157°45'33.987"W 21°01'27.472"N, 157°43'10.586"W 21°05'20.499"N, 157°39'27.802"W 21°10'02.179"N, 157°30'58.217"W	November through April, annually
Costa Rica Dome	Centered at 9°N and 88°W	Year-round

Name of Area	Location of Area	Months of Importance
Great Barrier Reef Between 16° S and 21° S	16°01.829'S, 145°38.783'E 15°52.215'S, 146°20.936'E 17°28.354'S, 146°59.392'E 20°16.228'S, 151°39.674'E 20°58.381'S, 150°30.897'E 20°17.007'S, 149°38.247'E 20°10.941'S, 149°18.247'E 20°02.403'S, 149°12.623'E 19°53.287'S, 149°03.986'E 19°49.866'S, 148°52.135'E 19°53.287'S, 148°44.302'E 19°47.965'S, 148°36.870'E 19°47.205'S, 148°26.024'E 19°19.978'S, 147°39.626'E 19°14.065'S, 147°37.014'E 19°08.913'S, 147°31.993'E 19°05.667'S, 147°24.160'E 19°07.576'S, 147°18.134'E 18°51.718'S, 146°51.219'E 18°44.258'S, 146°54.031'E 18°37.175'S, 146°51.420'E 18°31.620'S, 146°43.385'E 18°27.595'S, 146°40.573'E 17°36.676'S, 146°20.488'E 17°20.484'S, 146°16.671'E 17°07.745'S, 146°13.056'E 16°49.769'S, 146°11.047'E 16°41.835'S, 146°03.817'E 16°39.706'S, 145°54.979'E	May through September, annually
Bonney Upwelling on the west coast of Australia	37°12'20.036"S, 139°31'17.703"E 37°37'33.815"S, 139°42'42.508"E 38°10'36.144"S, 140°22'57.345"E 38°44'50.558"S, 141°33'50.342"E 39°07'04.125"S, 141°11'00.733"E 37°28'33.179"S, 139°10'52.263"E	December through May, annually
Northern Bay of Bengal and Head of Swatch-of-No-Ground	20°59.735'N, 89°07.675'E 20°55.494'N, 89°09.484'E 20°52.883'N, 89°12.704'E 20°55.275'N, 89°18.133'E 21°04.558'N, 89°25.294'E 21°12.655'N, 89°25.354'E 21°13.279'N, 89°16.833'E 21°06.347'N, 89°15.011'E	Year-round
Olympic Coast NMS and Prairie, Barkley Canyon, and Nitnat Canyon	Boundaries within 23 nmi (26.5 m; 42.6 km) of the coast from 47°07' N to 48°30' N latitude 48°30'01.995"N, 125°58'38.786"W 48°16'55.605"N, 125°38'52.052"W 48°23'07.353"N, 125°17'10.935"W 48°12'38.241"N, 125°16'42.339"W 47°58'20.361"N, 125°31'14.517"W 47°58'20.361"N, 126°06'16.322"W 48°09'46.665"N, 126°25'48.758"W	Olympic NMS: December, January, March, and May, annually The Prairie, Barkley Canyon, and Nitnat Canyon: June through September, annually

Name of Area	Location of Area	Months of Importance
Abrolhos Bank	16°35'34.909"S, 38°52'30.455"W 16°35'31.619"S, 38°43'41.069"W 16°40'00.131"S, 37°23'52.492"W 19°30'59.069"S, 37°23'52.446"W 19°30'59.974"S, 39°33'38.351"W 19°20'24.752"S, 39°30'33.03"W 18°52'16.884"S, 39°32'31.789"W 18°45'09.937"S, 39°32'27.709"W 18°30'59.345"S, 39°30'59.669"W 18°27'28.985"S, 39°30'13.453"W 18°17'30.429"S, 39°26'21.073"W 18°07'43.518"S, 39°19'52.924"W 18°09'24.931"S, 39°16'24.913"W 18°10'04.585"S, 39°12'30.425"W 18°10'20.682"S, 38°39'06.185"W 18°08'50.404"S, 38°35'00.059"W 18°06'05.466"S, 38°31'41.385"W 18°02'09.399"S, 38°29'26.179"W 17°58'01.372"S, 38°28'45.409"W 17°53'58.883"S, 38°29'34.612"W 16°48'58.768"S, 38°55'23.768"W 16°43'15.682"S, 38°53'40.007"W	August through November, annually

Attachment 2 – Authorized Take Estimates by Mission Areas

The Holder of this Authorization must maintain a running calculation/estimation of takes of each species over the effective period of these regulations. The take, by Level B harassment, that occurs during the year covered by this Authorization may not exceed 12 percent of any marine mammal stock listed in the following tables.

The Holder of this Authorization must also coordinate with the Holder of the Letter of Authorization issued to the USNS EFFECTIVE, the USNS ABLE, and the USNS IMPECCABLE, to ensure that these conditions are met for all vessels combined.

Category	Requested Take Authorization Level A harassment
Mysticetes	No more than 6 over the course of the regulations.
Odontocetes	No more than 25 over the course of the regulations.
Pinnipeds	No more than 25 over the course of the regulations.

Mission Area 1 - East of Japan	
Animal	Authorized Take Level B harassment
Bryde's whale	7
Common minke whale	26
Fin whale	5
North Pacific right whale	0
Sei whale	7
Baird's beaked whale	64
Common bottlenose dolphin	189
Cuvier's beaked whale	69
False killer whale	84
Ginkgo-toothed beaked whale	12
Hubbs' beaked whale	12
Killer whale	2
<i>Kogia</i> spp.	65
Pacific white-sided dolphin	41
Pantropical spotted dolphin	90
Pygmy killer whale	49
Risso's dolphin	192
Rough-toothed dolphin	149
Short-beaked common dolphin	1,367
Short-finned pilot whale	151
Sperm whale	24
Spinner dolphin	3
Striped dolphin	39

Mission Area 2 - North Philippine Sea	
Animal	Authorized Take Level B harassment
Blue whale	2
Bryde's whale	57
Common minke whale	354
Fin whale	18
Humpback whale	78
North Pacific right whale	2
Blainville's beaked whale	31
Common bottlenose dolphin	952
Cuvier's beaked whale	312
False killer whale	199
Fraser's dolphin	331
Ginkgo-toothed beaked whale	31
Killer whale	8
<i>Kogia</i> spp.	284
Longman's beaked whale	16
Melon-headed whale	294
Pacific white-sided dolphin	643
Pantropical spotted dolphin	984
Pygmy killer whale	144
Risso's dolphin	931
Rough-toothed dolphin	542
Short-beaked common dolphin	3,700
Short-finned pilot whale	1,078
Sperm whale	90
Spinner dolphin	61
Striped dolphin	2,362

Mission Area 3 - West Philippine Sea	
Animal	Authorized Take Level B harassment
Blue whale	2
Bryde's whale	63
Common minke whale	305
Fin whale	8
Humpback whale	18
Blainville's beaked whale	41
Common bottlenose dolphin	1,292
Cuvier's beaked whale	25
False killer whale	264
Fraser's dolphin	383
Ginkgo-toothed beaked whale	41
Killer whale	10
<i>Kogia</i> spp.	166
Longman's beaked whale	22
Melon-headed whale	390
Pantropical spotted dolphin	1,190
Pygmy killer whale	191
Risso's dolphin	1,007
Rough-toothed dolphin	590
Short-finned pilot whale	720
Sperm whale	108
Spinner dolphin	73
Striped dolphin	1,425

Mission Area 4 - Offshore Guam	
Animal	Authorized Take Level B harassment
Blue whale	2
Bryde's whale	36
Common minke whale	20
Fin whale	2
Humpback whale	2
Sei whale	18
Blainville's beaked whale	86
Common bottlenose dolphin	98
Cuvier's beaked whale	447
Dwarf sperm whale	531
False killer whale	78
Fraser's dolphin	304
Ginkgo-toothed beaked whale	69
Killer whale	12
Longman's beaked whale	31
Melon-headed whale	135
Pantropical spotted dolphin	1,666
Pygmy killer whale	12
Pygmy sperm whale	217
Risso's dolphin	75
Rough-toothed dolphin	254
Short-finned pilot whale	293
Sperm whale	98
Spinner dolphin	62
Striped dolphin	454

Mission Area 5 - Sea of Japan	
Animal	Authorized Take Level B harassment
Bryde's whale	10
Common minke whale	25
Common minke whale	11
Fin whale	73
North Pacific right whale	1
Western North Pacific gray whale	2
Baird's beaked whale	30
Common bottlenose dolphin	50
Cuvier's beaked whale	290
Dall's porpoise	2,637
False killer whale	111
Killer whale	8
<i>Kogia</i> spp.	137
Pacific white-sided dolphin	119
Risso's dolphin	558
Rough-toothed dolphin	303
Short-beaked common dolphin	6,035
Short-finned pilot whale	90
Sperm whale	120
Spinner dolphin	9
Stejneger's beaked whale	48
Striped dolphin	289

Mission Area 6 - East China Sea	
Animal	Authorized Take Level B harassment
Bryde's whale	24
Common minke whale (O)	154
Common minke whale (J)	24
Fin whale	8
North Pacific right whale	0
Western North Pacific gray whale	0
Blainville's beaked whale	13
Common bottlenose dolphin	26
Cuvier's beaked whale	8
False killer whale	32
Fraser's dolphin	139
Ginkgo-toothed beaked whale	13
Killer whale	4
<i>Kogia</i> spp.	61
Longman's beaked whale	7
Melon-headed whale	122
Pacific white-sided dolphin	0
Pantropical spotted dolphin	400
Pygmy killer whale	4
Risso's dolphin	356
Rough-toothed dolphin	117
Short-beaked common dolphin	1,503
Short-finned pilot whale	53
Sperm whale	30
Spinner dolphin	25
Striped dolphin	170

Mission Area 7 - South China Sea	
Animal	Authorized Take Level B harassment
Bryde's whale	10
Common minke whale (O)	43
Common minke whale (J)	24
Fin whale	4
North Pacific right whale	1
Western North Pacific gray whale	1
Blainville's beaked whale	7
Common bottlenose dolphin	5
Cuvier's beaked whale	4
False killer whale	19
Fraser's dolphin	60
Ginkgo-toothed beaked whale	7
Killer whale	4
<i>Kogia</i> spp.	31
Longman's beaked whale	10
Melon-headed whale	71
Pantropical spotted dolphin	142
Pygmy killer whale	3
Risso's dolphin	173
Rough-toothed dolphin	61
Short-finned pilot whale	23
Sperm whale	13
Spinner dolphin	9
Striped dolphin	61

Mission Area 8 - Offshore Japan (25-40° N)	
Animal	Authorized Take Level B harassment
Bryde's whale	9
Common minke whale (O)	10
Fin whale	6
Sei whale	6
Baird's beaked whale	3
Blainville's beaked whale	16
Common bottlenose dolphin	18
Cuvier's beaked whale	86
Dwarf sperm whale	192
False killer whale	34
Hubbs' beaked whale	12
Killer whale	5
Longman's beaked whale	6
Melon-headed whale	26
<i>Mesoplodon</i> spp.	12
Pacific white-sided dolphin	91
Pantropical spotted dolphin	175
Pygmy killer whale	1
Pygmy sperm whale	79
Risso's dolphin	19
Rough-toothed dolphin	88
Short-beaked common dolphin	3,365
Short-finned pilot whale	75
Sperm whale	49
Spinner dolphin	29
Striped dolphin	90
Hawaiian monk seal	1

Mission Area 9 - Offshore Japan (10-25° N)	
Animal	Authorized Take Level B harassment
Blue whale	1
Bryde's whale	12
Fin whale	1
Sei whale	5
Blainville's beaked whale	14
Common bottlenose dolphin	24
Cuvier's beaked whale	72
Dwarf sperm whale	119
False killer whale	18
Fraser's dolphin	66
Killer whale	3
Longman's beaked whale	5
Melon-headed whale	84
Pantropical spotted dolphin	346
Pygmy killer whale	2
Pygmy sperm whale	49
Risso's dolphin	12
Rough-toothed dolphin	44
Short-finned pilot whale	63
Sperm whale	42
Spinner dolphin	58
Striped dolphin	179

Mission Area 10 - Hawaii North	
Animal	Authorized Take Level B harassment
Blue whale	14
Bryde's whale	18
Common minke whale	13
Fin whale	7
Humpback whale	10
Sei whale	1
Blainville's beaked whale	107
Common bottlenose dolphin (Hawaii Pelagic)	31
Common bottlenose dolphin (Kauai/Niihau)	5
Cuvier's beaked whale	566
Dwarf sperm whale (Hawaiian)	628
False killer whale (Hawaii Pelagic)	53
False killer whale (Main Hawaiian Islands Insular)	2
False killer whale (Northwestern Hawaiian Islands)	2
Fraser's dolphin	353
Killer whale	10
Longman's beaked whale	38
Melon-headed whale	105
Pantropical spotted dolphin	312
Pygmy killer whale	35
Pygmy sperm whale	257
Risso's dolphin	90
Rough-toothed dolphin	321
Short-finned pilot whale	326
Sperm whale	224
Spinner dolphin (Hawaii Pelagic)	30
Spinner dolphin (Kauai/Niihau)	2
Spinner dolphin (Kure/Midway)	2
Spinner dolphin (Pearl and Hermes Reef)	2
Striped dolphin	457
Hawaiian monk seal	10

Mission Area 11 - Hawaii South	
Animal	Authorized Take Level B harassment
Blue whale	9
Bryde's whale	7
Common minke whale	7
Fin whale	5
Humpback whale	12
Sei whale	2
Blainville's beaked whale	35
Common bottlenose dolphin (Hawaii Pelagic)	32
Common bottlenose dolphin (Oahu)	2
Common bottlenose dolphin (4-Islands)	2
Common bottlenose dolphin (Hawaii Island)	2
Cuvier's beaked whale	181
Dwarf sperm whale	283
False killer whale (Hawaii Pelagic)	16
False killer whale (Main Hawaiian Islands Insular)	2
Fraser's dolphin	128
Killer whale	5
Longman's beaked whale	12
Melon-headed whale	31
Pantropical spotted dolphin	74
Pygmy killer whale	11
Pygmy sperm whale	116
Risso's dolphin	35
Rough-toothed dolphin	137
Short-finned pilot whale	100
Sperm whale	74
Spinner dolphin (Hawaii Pelagic)	22
Spinner dolphin (Oahu/4-Islands)	2
Spinner dolphin (Hawaii Island)	2
Striped dolphin	108
Hawaiian monk seal	5

APPENDIX B:
MARINE MAMMAL DENSITIES AND ABUNDANCES

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Appendix Table B. Density and abundance estimates for the marine mammal stocks occurring in the four mission areas of the northwestern Pacific Ocean in which SURTASS LFA sonar was operated during the August 2014 through August 2015 effective period. These same density and abundance estimates were used to estimate the pre-mission (DoN, 2014) and post-mission harassment of marine mammals (ESA-listed species highlighted). Abundance and density references are provided after the table.

MARINE MAMMAL SPECIES NAME	STOCK NAME ⁹	STOCK / ABUNDANCE (ANIMALS)	STOCK / ABUNDANCE REFERENCE(S)	DENSITY (ANIMALS PER KM ²) ¹⁰				DENSITY REFERENCE(S)
				WINTER	SPRING	SUMMER	FALL	
Blue whale	CNP	9,250	1, 2, 3	0.0001	0.0001		0.0001	1, 4, 5, 6
Bryde's whale	WNP	20,501	7	0.0006	0.0006	0.0006	0.0006	8
Common minke whale	WNP "O"	25,049	9	0.0044	0.0044	0.0044	0.0044	9
Common minke whale	WNP "J"	893	10	0.0018	0.0018	0.0018	0.0018	9
Fin whale	WNP	9,250	1, 11	0.0002	0.0002	0.0002	0.0002	1
Humpback whale	WNP	1,107	12	0.0009	0.0009		0.0009	6, 13
North Pacific right whale	WNP	922	14	0.0001	0.0001		0.0001	
Sei whale	NP	86	1	0.0003	0.0003		0.0003	15
Western North Pacific gray whale	WNP	121	7	0.0001	0.0001		0.0001	
Blainville's beaked whale	WNP	8,032	4, 5	0.0005	0.0005	0.0005	0.0005	4, 5
Common bottlenose dolphin	WNP Offshore	168,791	16	0.0146	0.0146	0.0146	0.0146	16
	IA	105,138	17	0.0008	0.0008	0.0008	0.0008	17
Cuvier's beaked whale	WNP	90,725	4, 5	0.0054	0.0054	0.0054	0.0054	4, 5
Dwarf sperm whale	WNP	350,553	4, 5	0.0071	0.0071	0.0071	0.0071	18
False killer whale	WNP Pelagic	16,668	16	0.0029	0.0029	0.0029	0.0029	16
	IA	9,777	17	0.0011	0.0011	0.0011	0.0011	15
Fraser's dolphin	WNP	220,789	4, 5	0.0042	0.0042	0.0042	0.0042	18
	CNP	10,226	18	0.0042	0.0042	0.0042	0.0042	18
Ginkgo-toothed beaked whale	NP	22,799	4, 5	0.0005	0.0005	0.0005	0.0005	4, 5
Killer whale	WNP	12,256	4, 5	0.0001	0.0001	0.0001	0.0001	19
<i>Kogia</i> spp.	WNP	350,553	4, 5	0.0031	0.0031	0.0031	0.0031	4, 5
Longman's beaked whale	WNP	1,007	18	0.0003	0.0003	0.0003	0.0003	19

9 NP=North Pacific; WNP=Western North Pacific; CNP=Central North Pacific; IA=Inshore Archipelago

10 No density in a season means that the marine mammal species/stock does not occur in that mission area during that season.

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Appendix Table B. Density and abundance estimates for the marine mammal stocks occurring in the four mission areas of the northwestern Pacific Ocean in which SURTASS LFA sonar was operated during the August 2014 through August 2015 effective period. These same density and abundance estimates were used to estimate the pre-mission (DoN, 2014) and post-mission harassment of marine mammals (ESA-listed species highlighted). Abundance and density references are provided after the table.

MARINE MAMMAL SPECIES NAME	STOCK NAME ⁹	STOCK / ABUNDANCE (ANIMALS)	STOCK / ABUNDANCE REFERENCE(S)	DENSITY (ANIMALS PER KM ²) ¹⁰				DENSITY REFERENCE(S)
				WINTER	SPRING	SUMMER	FALL	
Melon-headed whale	WNP	36,770	18	0.0043	0.0043	0.0043	0.0043	15
Pacific white-sided dolphin	WNP	931,000	20	0.0119	0.0119			4, 5
Pantropical spotted dolphin	WNP	438,064	16	0.0137	0.0137	0.0137	0.0137	16
Pygmy killer whale	WNP	30,214	4, 5	0.0021	0.0021	0.0021	0.0021	4, 5
Pygmy sperm whale	WNP	350,553	4, 5	0.0029	0.0029	0.0029	0.0029	18
Risso's dolphin	WNP	83,289	16	0.0106	0.0106	0.0106	0.0106	16
	IA	83,289	16	0.0106	0.0106	0.0106	0.0106	16
Rough-toothed dolphin	WNP	145,729	4, 5	0.0059	0.0059	0.0059	0.0059	4, 5
Short-beaked common dolphin	WNP	3,286,163	4, 5	0.0562	0.0562	0.0562	0.0562	4, 5
Short-finned pilot whale	WNP	53,608	16	0.0153	0.0153	0.0153	0.0153	16
Sperm whale	NP	102,112	21	0.0012	0.0012	0.0012	0.0012	15
Spinner dolphin	WNP	1,015,059	4, 5	0.0008	0.0008	0.0008	0.0008	18
Striped dolphin	WNP	570,038	16	0.0329	0.0329	0.0329	0.0329	16
	IA	570,038	16	0.0058	0.0058	0.0058	0.0058	19

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