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Prepared by:

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UNCLASSIFIED

2017 Annual Atlantic Fleet Training and Testing (AFTT) Exercise and Testing Report

14 November 2016 to 13 November 2017

13 FEBRUARY 2018

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ANNUAL AFTT EXERCISE AND TESTING REPORT

ATLANTIC FLEET TRAINING AND TESTING ANNUAL EXERCISE AND TESTING REPORT

INTRODUCTION

The U.S. Navy prepared this Annual Exercise and Testing Report covering the period from 14 November 2016 to 13 November 2017 in compliance with the National Marine Fisheries Service (NMFS) Final Rule, Letters of Authorization (LOA), and Incidental Take Statements under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) authorizations for the U.S. Navy's Atlantic Fleet Training and Testing (AFTT) Study Area.

This report is submitted as a combined report to present an overview of all U.S. Navy training and testing activities within the AFTT Study Area from 14 November 2016 through 13 November 2017. Responsibility for the management of the two AFTT LOAs remains as identified in the permits.

In the AFTT Final Rule and Letters of Authorization,[1] the following report subsections were specified and are presented within this report:

(1) Major Training Exercises (MTE)/Sinking Exercises (SINKEX)
- (i) Exercise Information (for each exercise)
- (ii) Individual Marine Mammal Sighting Information for each sighting when mitigation occurred during each MTE
- (iii) Evaluation (based on data gathered during all MTEs) of the effectiveness of mitigation measures designed to minimize the received level to which marine mammals may be exposed. This evaluation shall identify the specific observations that support any conclusions the Navy reaches about the effectiveness of the mitigation.
- (iv) Exercise information for each SINKEX

(2) Summary of Training Sources Used
- (i) Total annual usage of each type of sound source

(3) Sonar Exercise Notification

(4) Geographic Training Information Representation

(5) Ship Shock Trial Report

(6) Joint Logistics Over-the-Shore (JLOTS) Training Activities

(7) Summary of Testing Sources Used
- (i) Total annual usage of each type of sound source

(8) Geographic Testing Information Representation

The information in this report represents the best practical data collection for this period. To provide accounting for the entire five-year period of the authorization, Navy will also submit a 5-yr Close-out Exercise and Testing Report with final totals of authorized usage.

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[1] AFTT Requirements for Monitoring and Reporting, 50 CFR 218.85(f) (1) through (f) (4). The reporting requirements are also delineated in section 7(d) of the Training Letter of Authorization and section 7(d) of the Testing Letter of Authorization

(1) AFTT – MTE/SINKEX

This section summarizes authorized sonar use and marine mammal observations from MTEs conducted within the AFTT Study Area during the reporting period. The AFTT MTEs include ***Sustainment Exercises*** (SUSTEX), ***Integrated ASW Course*** (IAC), ***Joint Task Force Exercises*** (JTFEX), and ***Composite Training Unit Exercises*** (C2X).

(i) Exercise information

Table 1-i-1. MTEs conducted in the AFTT Study Area

(A) Exercise designator	(B) Date	(C) Locations	(D) Number of items or hours of each sound source bin used						(E) Number and types of of vessels and aircraft participating							
			MF1 (hours)	MF2 (hours)	MF3 (hours)	MF4 (hours)	MF5 (buoys)	ASW3 (hours)	CG	DDG	FFG	MH-60R/SH-60F dipping helo	SH-60B non-dipping helo	Submarines	MPRA	Non-ASW surface ship
C2X w/ IAC	21 Nov – 21 Dec 2016	VCOA/CPOA/JAXOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C2X	9 Jan – 1 Feb 2017	VCOA/CPOA/JAXOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IAC[1]	9 Feb – 12 Feb 2017	VCOA/CPOA/JAXOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SUSTEX	30 Mar – 13 Apr 2017	VCOA/CPOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SUSTEX	16 Oct – 1 Nov 2017	VCOA/CPOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C2X[2]	6 Nov – 12 Dec 2017	VCOA/CPOA/JAXOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*

VCOA=Virginia Capes Operating Area; CPOA=Cherry Point Operating Area; JAXOA=Jacksonville Operating Area

[1]Task Force Exercise (TFEX) 17-2 was a Group Sail, which included an IAC event

[2]This exercise concluded after the end of the reporting period. Data for the entire exercise is included in this report.

* Information is presented in the classified version of this report.

(ii) Individual marine mammal sighting information for each sighting when mitigation occurred during each MTE

Table 1-ii-1. AFTT MTE – Individual Marine Mammal and Sea Turtle Mitigation Sighting Information: C2X W/ IAC 21 Nov – 21 Dec 2016

(A) Date/time/location of sighting			(B) Species	(C) Number of individuals	(D) Initial detection sensor	(E) Indication of specific type of platform the observation was made from	(F) Length of time observers maintained visual contact with marine mammal(s) (min)	(G) Sea state (Beaufort scale)	(H) Visibility (nm)	(I) Sound source in use at time of sighting (Y/N)	(J) Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000 yd from sound source	(K) Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was	(L) If source in use is hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	(M) Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animals, and if any calves are present
21 Dec 16	1216Z	CPOA	whale	2	VIS	CG	1	2	10	N	501-1000	Maneuvered away	na	Two whales in vicinity of Charlie Hotel buoy. The observation was brief and the whales submerged.
21 Dec 16	1300Z	CPOA	whale	2	VIS	DDG	20	1	10	N	>2000	Maneuvered away	na	Whales breaching for first 20 minutes, every 4 or so minutes, then under the surface and out of sight.

CPOA=Cherry Point Operating Area; VIS=visual; N=no; na=not applicable

Table 1-ii-2. AFTT MTE – Individual Marine Mammal and Sea Turtle Mitigation Sighting Information: C2X 9 Jan – 1 Feb 2017

(A) Date/time/location of sighting	(B) Species	(C) Number of individuals	(D) Initial detection sensor	(E) Indication of specific type of platform the observation was made from	(F) Length of time observers maintained visual contact with marine mammal(s) (min)	(G) Sea state (Beaufort scale)	(H) Visibility (nm)	(I) Sound source in use at time of sighting (Y/N)	(J) Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000 yd from sound source	(K) Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was	(L) If source in use is hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	(M) Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animals, and if any calves are present
No marine mammal mitigations reported during this exercise.												

Table 1-ii-3. AFTT MTE – Individual Marine Mammal and Sea Turtle Mitigation Sighting Information: IAC 9 Feb – 12 Feb 2017

(A) Date/time/location of sighting			(B) Species	(C) Number of individuals	(D) Initial detection sensor	(E) Indication of specific type of platform the observation was made from	(F) Length of time observers maintained visual contact with marine mammal(s) (min)	(G) Sea state (Beaufort scale)	(H) Visibility (nm)	(I) Sound source in use at time of sighting (Y/N)	(J) Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000 yd from sound source	(K) Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was	(L) If source in use is hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	(M) Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animals, and if any calves are present
11 Feb 17	1525Z	JAXOA	dolphin	20	VIS	Helo	30	nr	nr	Y	<200	Sonar shutdown	na	nr
11 Feb 17	2109Z	JAXOA	whale	1	nr	CG	nr	nr	nr	Y	>2000	Sonar shutdown	na	nr

JAXOA=Jacksonville Operating Area; VIS=visual; nr=not reported; Y=yes; na=not applicable

Table 1-ii-4. AFTT MTE – Individual Marine Mammal and Sea Turtle Mitigation Sighting Information: SUSTEX 30 Mar – 13 Apr 2017

(A) Date/time/location of sighting			(B) Species	(C) Number of individuals	(D) Initial detection sensor	(E) Indication of specific type of platform the observation was made from	(F) Length of time observers maintained visual contact with marine mammal(s) (min)	(G) Sea state (Beaufort scale)	(H) Visibility (nm)	(I) Sound source in use at time of sighting (Y/N)	(J) Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000 yd from sound source	(K) Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was	(L) If source in use is hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	(M) Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animals, and if any calves are present
3 Apr 17	1115Z	CPOA	dolphin	20	VIS	DDG	2	1	10	Y	<200	Sonar shutdown	Dolphins bearing 000R, closing ship	Bow riding
11 Apr 17	1302Z	VCOA	whale	4	VIS	CG	5	1	10	N	501-1000	Maneuvered away	na	Blowing

CPOA=Cherry Point Operating Area; VCOA=Virginia Capes Operating Area; VIS=visual; Y=yes; N=no; na=not applicable

Table 1-ii-5. AFTT MTE – Individual Marine Mammal and Sea Turtle Mitigation Sighting Information: SUSTEX 16 Oct – 1 Nov 2017

(A) Date/time/location of sighting			(B) Species	(C) Number of individuals	(D) Initial detection sensor	(E) Indication of specific type of platform the observation was made from	(F) Length of time observers maintained visual contact with marine mammal(s) (min)	(G) Sea state (Beaufort scale)	(H) Visibility (nm)	(I) Sound source in use at time of sighting (Y/N)	(J) Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000 yd from sound source	(K) Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was	(L) If source in use is hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	(M) Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animals, and if any calves are present
27 Oct 17	1700Z	CPOA	whale	7	VIS	CG	5	3	10	N	>2000	Maneuvered away	na	Swimming, surface

CPOA=Cherry Point Operating Area; VIS=visual; N=no; na=not applicable

Table 1-ii-6. AFTT MTE – Individual Marine Mammal and Sea Turtle Mitigation Sighting Information: C2X 6 Nov – 12 Dec 2017

(A) Date/time/location of sighting			(B) Species	(C) Number of individuals	(D) Initial detection sensor	(E) Indication of specific type of platform the observation was made from	(F) Length of time observers maintained visual contact with marine mammal(s) (min)	(G) Sea state (Beaufort scale)	(H) Visibility (nm)	(I) Sound source in use at time of sighting (Y/N)	(J) Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000 yd from sound source	(K) Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was	(L) If source in use is hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	(M) Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animals, and if any calves are present
18 Nov 17	1912Z	CPOA	turtle	2	VIS	DDG	2	2	10	N	200-500	Maneuvered away	na	Floating
4 Dec 17	1215Z	CPOA	dolphin	10	VIS	DDG	10	2	10	N	501-1000	Maneuvered away	na	Swimming on surface

CPOA=Cherry Point Operating Area; VIS=visual; N=no; na=not applicable

(iii) Evaluation (based on data gathered during all exercises) of effectiveness

Between 14 November 2016 and 13 November 2017, there were a total of seven major training exercises, including three C2X, two IAC, and two SUSTEX.

Table 1-iii-1. AFTT MTEs and associated marine mammal and sea turtle mitigation sightings

MTE Type	Month	# of Exercise Days	# of Ships Involved (MFAS and non-MFAS)	# of Mitigation Sightings	# of Animals
C2X w/ IAC	Nov – Dec 2016	31	16	2	4
C2X	Jan – Feb 2017	23	4	0	0
IAC	Feb 2017	4	8	2	21
SUSTEX	Mar – Apr 2017	14	8	2	24
SUSTEX	Oct – Nov 2017	16	15	1	7
C2X	Nov – Dec 2017	36	9	2	12
	Total	**128**	**60**	**9**	**68**

Mitigation Effectiveness Discussion

The three categories of mitigation measures (Personnel Training, Lookout and Watchstander Responsibility, and Operating Procedures) outlined in the AFTT EIS and approved by NMFS were effective in detecting and appropriately mitigating exposure of marine mammals and seas turtles to mid-frequency active sonar. Fleet commanders and ship watch teams continue to improve individual awareness and enhance reporting practices. This improvement can be attributed to the various pre-exercise conferences, mandatory marine species awareness training, and making adjustments based upon the lessons learned. The mitigation zones were adhered to, and vessels and aircraft applied mitigation measures when marine mammals or sea turtles were visually observed within the requisite zones.

There were only two sightings of marine mammals during all AFTT MTEs occurring at ranges less than 1,000 yards during which active sonar was in use. These two sightings totaled 40 dolphins. (**Table 1-iii-2**).

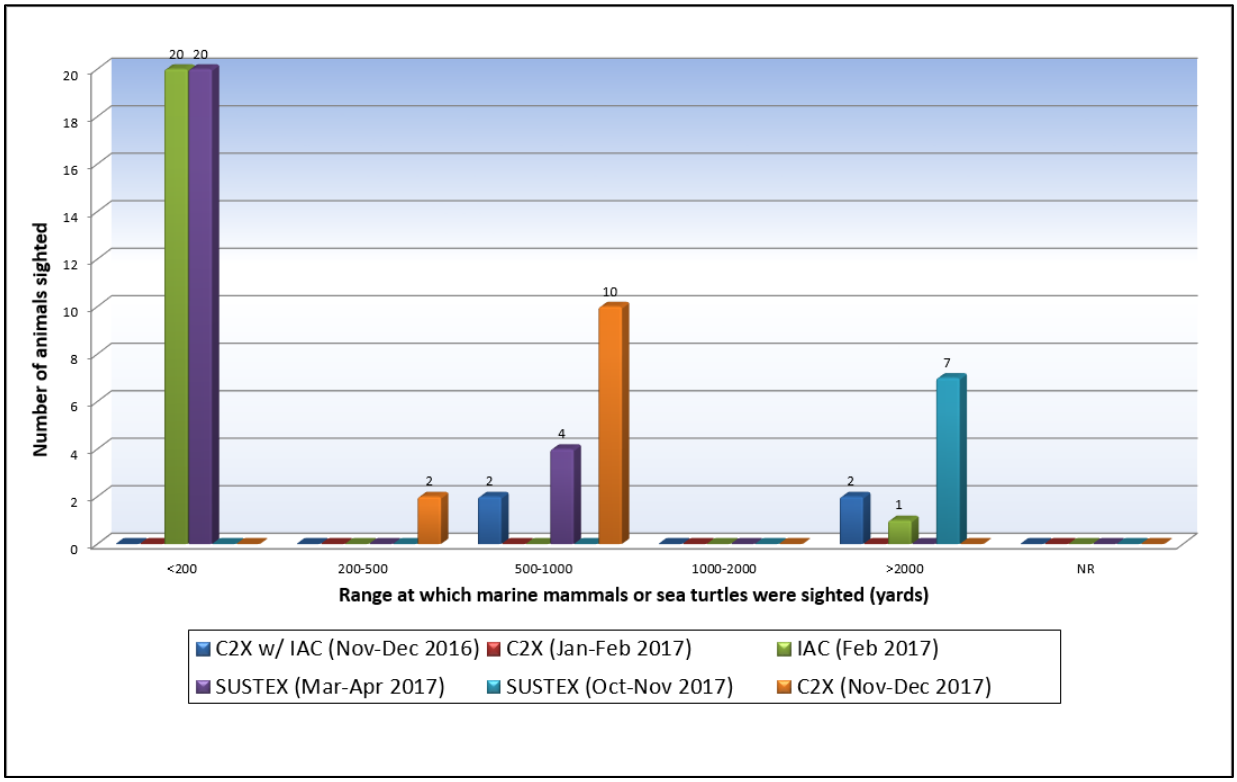
Table 1-iii-2. Breakdown of marine mammals and sea turtles sighted in the AFTT Study Area during MTEs at ranges less than 1000 yards concurrent with active sonar use

Range	< 200 yards	200 – 500 yards	500 – 1000 yards
Dolphins	40	0	0
Whales	0	0	0
Pinnipeds	0	0	0
Turtles	0	0	0
Total marine animals	40	0	0

For AFTT MTEs, there were three mitigation events when sonar was shut off or powered down during ASW training. In two of these cases, active sonar was secured due to dolphins observed within the mitigation zone. In the third case, a ship secured active sonar for a whale well outside of the required mitigation zone.

Figure 1-iii-1 depicts the reported ranges of all marine mammal and sea turtle sightings (with and without active sonar) from each of the seven MTEs within the AFTT Study Area. The number of sightings is variable by strike group, exercise type, and sea state at the time of the MTE.

Figure 1-iii-1. Marine mammal and sea turtle mitigation sightings by range and MTE in the AFTT Study Area



Deep diving animals were not observed during any of the MTEs. If exposure did occur, Navy assesses that these animals would not be exposed to significant levels for long periods based on the moving nature of ships during active sonar use, and even less so from less frequent and lower power aviation deployed active sonar systems such as dipping sonar and sonobuoys. For instance, during a one-hour dive by a beaked whale or sperm whale, a ship moving at a nominal 10 knot speed could transit about 10 nm from its original location, well beyond ranges predicted to have significant exposures (**Table 1-iii-3**).

Table 1-iii-3 contains a list of all mitigation events where sonar was on and the observed range was less than 1000 yards. It should be noted that with or without mitigation, given the relative motion of ships maneuvering at-sea and the independent marine animal movement, the time any given animal would be exposed to active sonar from surface ships is likely to be limited as shown by the distances calculated in **Table 1-iii-3** Column 13.

Table 1-iii-3. Sightings where sonar was on during detection of marine animals at ranges less than 1000 yards and mitigation occurred

1) OpArea (JAXOA, CPOA, VCOA)	2) MTE	3) Month	4) Species sighted	5) # of marine mammals sighted	6) Platform	7) Length of time observed (min)	8) Range at which marine mammal sighted	9) Mitigation (Sonar powerdown, Sonar shutdown)	10) Estimate MAX exposure PRIOR to mitigation (dB re 1uPa)[1]	11) Number of minutes sonar mitigation applied	12) Estimate exposure AFTER mitigation (dB re 1uPa)[1]	13) DISTANCE ship would have moved given length of mitigation and nominal 10-knot ship speed (yds)	14) If source in use is hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	15) Observed behavior
JAXOA	IAC	Feb	dolphin	20	Helo	30	<200	Sonar shutdown	<167	30	None	na (aircraft)	na	nr
CPOA	SUSTEX	Apr	dolphin	20	DDG	2	<200	Sonar shutdown	<189	3	None	1,000	Dolphins bearing 000R, closing ship	Bow riding

Notes:
[1] Estimated exposure based on 20Log[R] spherical spreading propagation loss for ranges less than 1000 yards and where nominal active sonar Source Level (SL) assumed to be 235 dB for DDGs and 225 for FFGs. Actual operating parameters and oceanographic condition likely result is lower exposure. This calculation assumes exposure prior to mitigation. Once animal was spotted at the range indicated, applied mitigation would have resulted in much lower to no exposures.

Exposure Assessment

Estimated exposures within 2000 yards can be determined based on standard formulas of how sound propagates in water. Spherical spreading is generally valid within 1000 yards from the sound source, and can be expressed as spreading loss (in dB from a source) equals 20logR (with "R" being range from the source in yards). Spherical spreading loss in the first 1000 yards equates to 60 dB of loss. At ranges between 1000 and 2000 yards a portion of the sound waves can become trapped in a surface duct or by the sea surface and bottom (depending on depth of the sound transmission) and may not expand vertically. The spreading wave in this case then forms an expanding cylinder. Cylindrical spreading loss in dB between two points can be calculated by using the formula (10logR2/R1), with "R2" being the longer range, and "R1" being 1000 yards. Cylindrical spreading loss between 1000 and 2000 yards equates to an additional 3 dB of loss. For this assessment Navy assumes the most conservative case where all the sound between 1000 and 2000 yards is trapped. Therefore, by the time the wave has propagated to 2000 yards, the sonar signal strength has decreased by a minimum total of 63 dB. Using the AN/SQS-53 sonar as an example, transmitting at 235 dB and subtracting the 63 dB of spreading loss equates to an estimated sonar Receive Level (RL) of 172 dB at 2000 yards. The spreading loss formulas are used to make very conservative assumptions about potential exposure. The formula is an estimation of spreading losses only and does not take into account other factors that could increase the total propagation losses such as oceanographic conditions, attenuation losses, scattering losses, and Navy-unique MFAS operating parameters which would result in slightly lower sonar transmit levels. Use of this approach to estimate potential RL at any given animal assumes the horizontal range from a visual sighting accounts for an animal across all depths at which an animal travels to predict the maximum, worst case potential exposure. In other words, this estimated worst case exposure is presented independent of the animal's actual depth level, since a) time and depth of current and previous dives cannot be deduced from a limited surface sighting, and b) oceanographic and tactical conditions influence actual sound propagation at different depths. Given the relative motion of ships and animals at sea, the time spent with any given exposure from surface ships is likely to be limited.

Passive sonar is an acoustic device used for listening to underwater sound and does not involve transmitting sound into the water column. Passive sonar use is driven by the tactical nature of an ASW exercise or training event, and is employed whenever possible. Given the nature of passive sonar technology and underwater sound propagation, determining range and absolute position of a marine animal is exceedingly difficult and generally not possible with any single ship-based passive sonar. Skilled operators or unique circumstances may sometimes allow real-time or near-real time estimations of range to a vocalizing marine animal at the expense of interrupting the ship's ASW training at the time. Active sonar, on the other hand, is critical in providing range and bearing to potential underwater submarines and mines. In addition, passive sonar can only detect marine animals that are vocalizing (i.e., making underwater sound as part of communication and echolocation). Marine animal vocalization is based on individual needs at a particular moment, species-level foraging, and mating strategies, and other oceanographic or biological factors. For instance, for some species, it is believed only males typically vocalize (ex. humpback whales, blue whales, fin whales, and minke whales). Depending on oceanographic conditions and animal source levels, when marine animals do vocalize, sounds can easily travel one to several tens of kilometers (km) (0.5 nautical mile (nm) to tens of nm) for some mid-to-low frequency animals, and tens to hundreds of km for very low frequency baleen whales (i.e., blue and fin whales). These ranges demonstrate that even if the marine animal vocalization can be detected, it does not mean the animal is necessarily close to the passive sonar sensor. Determining when or if a marine animal is within a mitigation zone by passive acoustic detection is not normally technically feasible.

There is no information from which to assess how many, if any, animals not observed by Navy lookouts may or may not have been exposed to MFAS received levels equal to or greater than the exposure criteria set forth by NMFS. However, many of the ESA-listed species in AFTT, with the exception of perhaps the sperm whale, are easier to spot on the surface due to shorter dive times and larger animal size (humpback whale, fin whale, sei whale). Dolphins, the most common cetacean seen in AFTT often occur in large, visible pods. Beaked whales are acknowledged to be difficult to observe at-sea due to deep diving profiles and short surface intervals. Sea turtles are also acknowledged to be difficult to observe at-sea due to their size and that they typically swim beneath the ocean surface and have short surface intervals. For all marine mammal and sea turtle sightings made by Navy platforms during AFTT MTEs (**Tables 1-iii-1**, **1-iii-2**, **1-iii-3** and **Figure 1-iii-1**), there was no obvious indication or report that any animal behaved in a manner not associated with normal movement.

(iv) Exercise Information for Each SINKEX

No SINKEXs were conducted in the AFTT Study Area during the reporting period.

(2) AFTT – Summary of Training Sources Used

(i) Total annual usage of each type of sound source

This section summarizes total annual usage of each type of sound source used for training within AFTT from 14 November 2016 to 13 November 2017, as well as cumulative usage over the 5-year authorization.

Table 2-i-1. Annual training sound source usage within the AFTT Study Area by source BIN

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Authorized Amount (14Nov16-13Nov17)	Actual Usage (14Nov16-13Nov17)	% Used of Authorized Amount
(1) Active Acoustic Sources Used During Annual Training				
MF1	Hull-mounted sonars (e.g. AN/SQS-53)	9,844 hours	*	*
MF1K	Hull-mounted sonar Kingfisher mode	163 hours	*	*
MF2	Hull-mounted sonars (e.g. AN/SQS-56)	3,150 hours	*	*
MF2K	Hull-mounted sonar Kingfisher mode	61 hours	*	*
MF3	Hull-mounted submarine sonar (e.g. AN/BQQ-10)	2,058 hours	*	*
MF4	Helicopter dipping sonar (e.g. AN/AQS-22)	927 hours	*	*
MF5	Acoustic sonobuoys (e.g. AN/SSQ-62)	14,556 buoys	*	*
MF11	High duty cycle hull-mounted sonars (e.g. AN/SQS-53 HDC)	800 hours	*	*
MF12	High duty cycle towed array sonars (e.g. HDC-VDS)	687 hours	*	*
HF1	Hull-mounted submarine sonar (e.g. AN/BQQ-10)	1,676 hours	*	*
HF4	Mine detection / classification sonars	8,464 hours	*	*
ASW1	Mid-frequency Deep Water Active Distributed System (DWADS)	128 hours	*	*
ASW2	Mid-frequency Multi-static Active Coherent sonobuoy (e.g. AN/SSQ-125)	2,620 buoys	*	*
ASW3	Mid-frequency towed acoustic countermeasure (e.g. AN/SLQ-25)	13,586 hours	*	*
ASW4	Mid-frequency expendable acoustic device countermeasure (e.g. ADC/NAE)	1,365 devices	*	*
TORP1	Lightweight torpedo (e.g. MK 54/MK 46)	54 torpedoes	*	*
TORP2	Heavyweight torpedo (e.g. MK 48)	80 torpedoes	*	*
(2) Explosive Sources Used During Annual Training				
E1	Medium-caliber projectiles	124,552 detonations	0 detonations	0%
E2	Medium-caliber projectiles	856 detonations	2 detonations	<1%
E3	Large-caliber projectiles	3,132 detonations	0 detonations	0%
E4	5 lb. shaped charge	2,190 detonations	4 detonations	<1%
E5	5-inch projectiles	14,370 detonations	137 detonations	<1%
E6	15 lb. shaped charge	500 detonations	17 detonations	3%
E7	40 lb. demo block / shaped charge	322 detonations	0 detonations	0%
E8	250 lb. bomb	77 detonations	1 detonations	<1%
E9	500 lb. bomb	2 detonations	0 detonations	0%

E10	1,000 lb. bomb	8 detonations	0 detonations	0%
E11	650 lb. mine	1 detonation	0 detonations	0%
E12	2,000 lb. bomb	133 detonations	33 detonations	25%
(3) Active Acoustic Sources Used During Non-Annual Training				
HF4	Mine detection/classification sonars	192 hours	*	*
(4) Explosive Sources Used During Non-Annual Training				
E2	Medium-caliber projectiles	2 detonations	0 detonations	0%
E4	Improved Extended Echo Ranging sonobuoy	2 detonations	0 detonations	0%

* Information is presented in the classified version of this report.

Table 2-i-2. 5-year cumulative training sound source usage within the AFTT Study Area by source BIN

Sound Source Bin	Year 1 Actual Usage (14Nov13-13Nov14)	Year 2 Actual Usage (14Nov14-13Nov15)	Year 3 Actual Usage (14Nov15-13Nov16)	Year 4 Actual Usage (14Nov16-13Nov17)	5-yr Authorized Amount (14Nov13-13Nov18)	5-yr Cumulative Actual Usage (14Nov13-13Nov18)	% Used of 5-yr Authorized Amount
(1) Active Acoustic Sources Used During Annual Training							
MF1	*	*	*	*	49,220 hours	*	*
MF1K	*	*	*	*	815 hours	*	*
MF2	*	*	*	*	15,750 hours	*	*
MF2K	*	*	*	*	305 hours	*	*
MF3	*	*	*	*	10,290 hours	*	*
MF4	*	*	*	*	4,635 hours	*	*
MF5	*	*	*	*	72,780 buoys	*	*
MF11	*	*	*	*	4,000 hours	*	*
MF12	*	*	*	*	3,435 hours	*	*
HF1	*	*	*	*	8,380 hours	*	*
HF4	*	*	*	*	42,320 hours	*	*
ASW1	*	*	*	*	640 hours	*	*
ASW2	*	*	*	*	13,100 buoys	*	*
ASW3	*	*	*	*	67,930 hours	*	*
ASW4	*	*	*	*	6,825 devices	*	*
TORP1	*	*	*	*	270 torpedoes	*	*
TORP2	*	*	*	*	400 torpedoes	*	*
(2) Explosive Sources Used During Annual Training							
E1	55	35	0	0	622,760 detonations	90	<1%
E2	0	0	0	2	4,280 detonations	2	<1%
E3	0	1	0	0	15,660 detonations	1	<1%
E4	16	14	3	4	10,950 detonations	37	<1%
E5	115	93	115	137	71,850 detonations	460	<1%
E6	25	35	38	17	2,500 detonations	115	5%
E7	0	0	0	0	1,610 detonations	0	0%
E8	6	2	0	1	385 detonations	9	2%
E9	0	0	0	0	10 detonations	0	0%
E10	2	0	0	0	40 detonations	2	5%

E11	0	0	0	0	5 detonations	0	0%
E12	28	50	12	33	665 detonations	123	18%
(3) Active Acoustic Sources Used During Non-Annual Training							
HF4	*	*	*	*	960 hours	*	*
(4) Explosive Sources Used During Non-Annual Training							
E2	0	0	0	0	10 detonations	0	0%
E4	0	0	0	0	10 detonations	0	0%

* Information is presented in the classified version of this report.

(3) AFTT – Sonar Exercise Notification

The Navy submitted all required information to NMFS for all MTEs during the reporting period, including location of the exercise, beginning and end dates of the exercise, and type of exercise.

(4) AFTT – Geographic Training Information Representation

The precise locations and frequency of ASW training is classified. There is currently no method to declassify the sensitivity of this data in order to publish this type of information in an unclassified report. For this reason, the only available method for this information to be disseminated for the foreseeable future is in the classified version of this Annual Exercise Report.

(5) AFTT – Ship Shock Trial Report

No Ship Shock Trials were conducted in the AFTT Study Area during the reporting period.

(6) AFTT – Joint Logistics Over-the-Shore (JLOTS) Training Activities

No JLOTS training activities were conducted in the AFTT Study Area during the reporting period.

(7) AFTT – Summary of Testing Sound Sources

(i) Total annual usage of each type of sound source

This section summarizes total annual usage of each type of sound source used for testing within AFTT from 14 November 2016 to 13 November 2017, as well as cumulative usage over the 5-year authorization.

Table 7-i-1. Annual testing sound source usage within the AFTT Study Area by source BIN

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Authorized Amount (14Nov16-13Nov17)	Actual Usage (14Nov16-13Nov17)	% Used of Authorized Amount
(1) Active Acoustic Sources Used During Annual Testing				
LF4	Low-frequency sources from 180 dB up to 200 dB	254 hours	*	*
LF5	Low-frequency sources from 160 dB up to 180 dB	370 hours	*	*
MF1	Hull-mounted sonars (e.g. AN/SQS-53)	220 hours	*	*
MF1K	Hull-mounted sonar Kingfisher mode	19 hours	*	*
MF2	Hull-mounted sonars (e.g. AN/SQS-56)	36 hours	*	*
MF3	Hull-mounted submarine sonar (e.g. AN/BQQ-10)	434 hours	*	*
MF4	Helicopter dipping sonar (e.g. AN/AQS-22)	776 hours	*	*

MF5	Acoustic sonobuoys (e.g. AN/SSQ-62)	4,184 buoys	*	*
MF6	Active underwater sound signal devices (e.g. MK 84 SUS)	303 items	*	*
MF8	Other active sources greater than 200 dB	90 hours	*	*
MF9	Other active sources from 180 dB up to 200 dB	13,034 hours	*	*
MF10	Other active sources from 160 dB up to 180 dB	1,067 hours	*	*
MF12	High duty cycle towed array sonars (e.g. HDC-VDS)	144 hours	*	*
HF1	Hull-mounted submarine sonar (e.g. AN/BQQ-10)	1,243 hours	*	*
HF3	Other hull-mounted submarine sonars	384 hours	*	*
HF4	Mine detection / classification sonars	5,572 hours	*	*
HF5	Other active sources greater than 200 dB	1,206 hours	*	*
HF6	Other active sources from 180 dB up to 200 dB	1,974 hours	*	*
HF7	Other active sources from 160 dB up to 180 dB	366 hours	*	*
ASW1	Mid-frequency Deep Water Active Distributed System (DWADS)	96 hours	*	*
ASW2	Mid-frequency Multi-static Active Coherent sonobuoy (e.g. AN/SSQ-125)	2,743 buoys	*	*
ASW2	Mid-frequency Multi-static Active Coherent sonobuoy (e.g. AN/SSQ-125)	274 hours	*	*
ASW3	Mid-frequency towed acoustic countermeasure (e.g. AN/SLQ-25)	948 hours	*	*
ASW4	Mid-frequency expendable acoustic device countermeasure (e.g. ADC/NAE)	483 devices	*	*
TORP1	Lightweight torpedo (e.g. MK 54/MK 46)	581 torpedoes	*	*
TORP2	Heavyweight torpedo (e.g. MK 48)	521 torpedoes	*	*
M3	Mid-frequency acoustic modems	461 hours	*	*
SD1/SD2	Swimmer detection sonars	230 hours	*	*
FLS2/FLS3	Forward Looking Sonar systems	365 hours	*	*
SAS1	Mid-frequency SAS systems	6 hours	*	*
SAS2	High-frequency SAS systems	3,424 hours	*	*
(2) Explosive Sources Used During Annual Testing				
E1	Medium-caliber projectiles	25,501 detonations	0 detonations	0%
E2	Medium-caliber projectiles	0 detonations	-	-
E3	Large-caliber projectiles	2,912 detonations	275 detonations	9%
E4	Improved Extended Echo Ranging sonobuoy	1,432 detonations	0 detonations	0%
E5	5-inch projectiles	495 detonations	0 detonations	0%
E6	15 lb. shaped charge	54 detonations	0 detonations	0%
E7	40 lb. demo block / shaped charge	0 detonations	-	-
E8	250 lb. bomb	11 detonations	0 detonations	0%
E9	500 lb. bomb	0 detonations	-	-
E10	1,000 lb. bomb	10 detonations	0 detonations	0%
E11	650 lb. mine	27 detonations	0 detonations	0%
E12	2,000 lb. bomb	0 detonations	-	-
E13	1,200 lb. HBX	0 detonations	-	-
E14	2,500 lb. HBX	4 detonations	0 detonations	0%
(3) Active Acoustic Sources Used During Non-Annual Testing				

LF5	Low-frequency sources from 160 dB up to 180 dB	240 hours	*	*
MF9	Other active sources from 180 dB up to 200 dB	480 hours	*	*
HF5	Other active sources greater than 200 dB	240 hours	*	*
HF6	Other active sources from 180 dB up to 200 dB	720 hours	*	*
HF7	Other active sources from 160 dB up to 180 dB	240 hours	*	*
FLS2/FLS3	Forward Looking Sonar systems	240 hours	*	*
SAS2	High-frequency SAS systems	720 hours	*	*
(4) Explosive Sources Used During Non-Annual Testing				
E1	Medium-caliber projectiles	600 detonations	0 detonations	0%
E16	10,000 lb. HBX	12 detonations	0 detonations	0%
E17	40,000 lb. HBX	4 detonations	0 detonations	0%

***** Information is presented in the classified version of this report.

Table 7-i-2. 5-year cumulative testing sound source usage within the AFTT Study Area by source BIN

Sound Source Bin	Year 1 Actual Usage (14Nov13-13Nov14)	Year 2 Actual Usage (14Nov14-13Nov15)	Year 3 Actual Usage (14Nov15-13Nov16)	Year 4 Actual Usage (14Nov16-13Nov17)	5-yr Authorized Amount (14Nov13-13Nov18)	5-yr Cumulative Actual Usage (14Nov13-13Nov18)	% Used of 5-yr Authorized Amount
(1) Active Acoustic Sources Used During Annual Testing							
LF4	*	*	*	*	1,270 hours	*	*
LF5	*	*	*	*	1,850 hours	*	*
MF1	*	*	*	*	1,100 hours	*	*
MF1K	*	*	*	*	95 hours	*	*
MF2	*	*	*	*	180 hours	*	*
MF3	*	*	*	*	2,170 hours	*	*
MF4	*	*	*	*	3,880 hours	*	*
MF5	*	*	*	*	20,920 buoys	*	*
MF6	*	*	*	*	1,515 items	*	*
MF8	*	*	*	*	450 hours	*	*
MF9	*	*	*	*	65,170 hours	*	*
MF10	*	*	*	*	5,335 hours	*	*
MF12	*	*	*	*	720 hours	*	*
HF1	*	*	*	*	6,215 hours	*	*
HF3	*	*	*	*	1,920 hours	*	*
HF4	*	*	*	*	27,860 hours	*	*
HF5	*	*	*	*	6,030 hours	*	*
HF6	*	*	*	*	9,870 hours	*	*
HF7	*	*	*	*	1,830 hours	*	*
ASW1	*	*	*	*	480 hours	*	*
ASW2	*	*	*	*	13,715 buoys	*	*
ASW2	*	*	*	*	1,370 hours	*	*
ASW3	*	*	*	*	4,740 hours	*	*
ASW4	*	*	*	*	2,415 devices	*	*

TORP1	*	*	*	*	2,905 torpedoes	*	*
TORP2	*	*	*	*	2,605 torpedoes	*	*
M3	*	*	*	*	2,305 hours	*	*
SD1/SD2	*	*	*	*	1,150 hours	*	*
FLS2/FLS3	*	*	*	*	1,825 hours	*	*
SAS1	*	*	*	*	30 hours	*	*
SAS2	*	*	*	*	17,120 hours	*	*
(2) Explosive Sources Used During Annual Testing							
E1	0	0	0	0	127,505 detonations	0	0%
E2	-	-	-	-	0 detonations	-	-
E3	0	0	0	275	14,560 detonations	275	2%
E4	12	0	0	0	7,160 detonations	12	<1%
E5	5	0	0	0	2,475 detonations	5	<1%
E6	0	8	12	0	270 detonations	20	<1%
E7	-	-	-	-	0 detonations	-	-
E8	0	0	0	0	55 detonations	0	0%
E9	-	-	-	-	0 detonations	-	-
E10	0	0	0	0	50 detonations	0	0%
E11	0	0	0	0	135 detonations	0	0%
E12	-	-	-	-	0 detonations	-	-
E13	-	-	-	-	0 detonations	-	-
E14	0	0	0	0	20 detonations	0	0%
(3) Active Acoustic Sources Used During Non-Annual Testing							
LF5	*	*	*	*	1,200 hours	*	*
MF9	*	*	*	*	2,400 hours	*	*
HF5	*	*	*	*	1,200 hours	*	*
HF6	*	*	*	*	3,600 hours	*	*
HF7	*	*	*	*	1,200 hours	*	*
FLS2/FLS3	*	*	*	*	1,200 hours	*	*
SAS2	*	*	*	*	3,600 hours	*	*
(4) Explosive Sources Used During Non-Annual Testing							
E1	0	0	0	0	3,000 detonations	0	0%
E16	0	0	0	0	60 detonations	0	0%
E17	0	0	0	0	20 detonations	0	0%

* Information is presented in the classified version of this report.

(8) AFTT – Geographic Testing Information Representation

The precise locations and frequency of ASW testing is classified. There is currently no method to declassify the sensitivity of this data in order to publish this type of information in an unclassified report. For this reason the only available method for this information to be disseminated for the foreseeable future is in the classified version of this Annual Testing Report.

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