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National Marine Fisheries Service
Office of Protected Resources

Prepared by:

Department of the Navy

In accordance with the Letters of Authorization
Under the MMPA and ITS authorization under
the ESA 14 November 2013

UNCLASSIFIED
2015 Annual
Atlantic Fleet Training and Testing (AFTT)
Exercise and Testing Report
14 November 2014 to 13 November 2015

13 FEBRUARY 2016
UNCLASSIFIED

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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 2014 to 13 November 2015 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 2014 through 13 November 2015. 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 present within this report:

- (1) Major Training Exercises (MTE)/SINKEX
 - (i) Exercise Information (for each exercise)
 - (ii) Individual Marine Mammal Sighting Information (for each sighting in 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.

¹AFTT 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 – Major Training Exercises/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* (JTSEX), 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 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	8 Jan – 6 Feb 2015	VCOA/CPOA/JAXOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IAC ¹	23 Feb – 7 Mar 2015	VCOA/CPOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C2X w/IAC	16 Jul – 4 Aug 2015	VCOA/CPOA/JAXOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C2X w/ IAC	2 Sep – 29 Sep 2015	VCOA/CPOA/JAXOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

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

¹ Task Force Exercise (TFEX) 15-2 was a Group Sail which included an IAC event

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

(ii) Individual marine mammal and sea turtle sighting information by exercise

Table 1-ii-1. AFTT MTE – Individual Marine Mammal and Sea Turtle Sighting Information: C2X W/ IAC 8 Jan – 6 Feb 2015

(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,	
8 Jan 15 2000Z	VCOA	whale	1	VIS	DDG	5	1	10	N	500-1000	none	na	nr
8 Jan 15 2100Z	VCOA	whale	1	VIS	DDG	4	1	10	N	200-500	none	na	nr
8 Jan 15 2119Z	VCOA	whale	1	VIS	DDG	1	1	10	N	<200	none	na	nr

9 Jan 15	1530Z	VCOA	whale	3	VIS	DDG	3	1	10	N	1000-2000	none	na	Broaching
9 Jan 15	1935Z	CPOA	dolphin	15	VIS	DDG	50	3	10	N	<200	none	na	Bow riding
10 Jan 15	1750Z	CPOA	dolphin	18	VIS	DDG	15	3	10	Y	<200	Sonar shutdown	Dolphins bearing 353R, paralleling ship	Swimming ivo ship, potentially on transit. Nothing unusual to report although limited jumping and interaction with bow wave observed
11 Jan 15	2040Z	CPOA	turtle	1	VIS	CG	1	1	10	N	<200	none	na	nr
15 Jan 15	1400Z	CPOA	whale	1	ACO	Helo	11	1	10	N	<200	none	na	Calves observed
16 Jan 15	1712Z	JAXOA	dolphin	4	VIS	CG	10	2	10	N	<200	none	na	nr
16 Jan 15	2029Z	JAXOA	dolphin	7	VIS	CG	5	2	10	N	<200	none	na	nr
16 Jan 15	2113Z	JAXOA	turtle	1	VIS	CG	1	2	10	N	<200	none	na	nr
17 Jan 15	1912Z	JAXOA	dolphin	3	VIS	DDG	2	2	10	N	<200	none	na	Quick sighting with no real behavioral activity observed. Dolphins surfaced momentarily before diving out of sight
18 Jan 15	2025Z	JAXOA	dolphin	35	VIS	DDG	45	2	10	N	<200	none	na	Bow riding
20 Jan 15	1248Z	JAXOA	dolphin	3	VIS	DDG	1	2	10	N	<200	none	na	Quick sighting, dophins seen jumping through waves
21 Jan 15	0330Z	JAXOA	dolphin	5	VIS	DDG	7	3	10	N	<200	none	na	Dolphins were riding the bow of the replenishment ship during a RAS
22 Jan 15	1012Z	JAXOA	dolphin	1	VIS	DDG	1	1	10	N	<200	none	na	Quick sighting, dolphin seen jumping through waves

22 Jan 15	1400Z	JAXOA	dolphin	4	VIS	DDG	1	1	10	N	200-500	none	na	Quick sighting, dolphins seen jumping through waves
22 Jan 15	2200Z	JAXOA	dolphin	15	VIS	DDG	60	2	10	N	<200	none	na	Bow riding, calves observed
25 Jan 15	1823Z	JAXOA	dolphin	3	VIS	DDG	5	4	10	N	<200	none	na	Quick sighting, dolphins seen jumping through waves
28 Jan 15	0820Z	JAXOA	dolphin	4	VIS	DDG	2	5	10	N	<200	none	na	Dolphins swam inbetween the ships during underway replenishment serials, ships no more than 200 yds apart. Normal behaviour, jumping through waves
2 Feb 15	1248Z	JAXOA	dolphin	6	VIS	DDG	3	4	9	N	200-500	none	na	Quick sighting, dolphins seen jumping through waves
8 Feb 15	1538Z	VCOA	whale	1	VIS	DDG	8	1	10	N	1000-2000	none	na	Sighted dorsal fin and blow
10 Feb 15	1745Z	JAXOA	dolphin	6	VIS	DDG	1	2	10	N	<200	none	na	Closed bow wake, then dispersed underwater
10 Feb 15	2215Z	CPOA	dolphin	5	VIS	DDG	20	2	10	N	200-500	Maneuvered away	na	nr
11 Feb 15	2038Z	CPOA	whale	1	VIS	DDG	10	3	10	N	>2000	none	na	Blowing
12 Feb 15	1300Z	CPOA	dolphin	30	VIS	DDG	2	2	10	N	500-1000	none	na	Closed bow wake, crested and jumped frequently, then dispersed underwater
15 Feb 15	1525Z	CPOA	dolphin	20	VIS	DDG	2	4	10	N	500-1000	none	na	Dolphins swam in bow wake then dispersed
21 Feb 15	1819Z	JAXOA	dolphin	2	VIS	DDG	1	1	10	N	<200	none	na	Creeping and jumping, then swam away
22 Feb 15	1200Z	JAXOA	dolphin	2	VIS	DDG	nr	nr	nr	N	nr	none	na	Swimming
25 Feb 15	2130Z	JAXOA	dolphin	8	VIS	DDG	nr	nr	nr	N	200-500	none	na	Swimming

27 Feb 15	1820Z	JAXOA	dolphin	15	VIS	DDG	10	3	10	N	<200	none	na	Cresting and jumping, then swam away
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nr=not reported; VIS=visual; ACO=acoustic; Y=yes; N=no; na=not applicable

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

Table 1-ii-2. AFTT MTE – Individual Marine Mammal and Sea Turtle Sighting Information: IAC 23 Feb – 7 Mar 2015

(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		
24 Feb 15	1405Z	CPOA	dolphin	2	VIS	DDG	1	4	2	N	200-500	none	na	Bow riding
24 Feb 15	1630Z	CPOA	dolphin	8	VIS	DDG	3	4	1	N	200-500	none	na	Bow riding
1 Mar 15	1126Z	CPOA	dolphin	10	VIS	DDG	10	2	10	N	200-500	none	na	Closed the bow then rode the bow for 10 minutes before breaking away
2 Mar 15	1335Z	CPOA	turtle	1	VIS	DDG	2	2	10	N	200-500	none	na	Floating
2 Mar 15	1953Z	AFTT	dolphin	10	VIS	DDG	5	2	10	N	<200	none	na	Crossed our bow from port to starboard. Did not stay with ship
3 Mar 15	0848Z	VCOA	dolphin	12	VIS	DDG	22	2	8	N	200-500	none	na	Just swimming
5 Mar 15	1505Z	VCOA	turtle	1	VIS	DDG	1	3	4	N	<200	none	na	Surfaced, then dove
5 Mar 15	1900Z	VCOA	dolphin	11	VIS	DDG	10	4	1	N	<200	none	na	Bow riding
5 Mar 15	1917Z	VCOA	turtle	1	VIS	CG	4	3	6	N	<200	none	na	Sun bathing
7 Mar 15	1809Z	VCOA	turtle	1	VIS	CG	3	3	9	N	200-500	none	na	Sun bathing

nr=not reported; VIS=visual; ACO=acoustic; Y=yes; N=no; na=not applicable

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

Note: IAC was included as part of TFEF 15-2.

Table 1-ii-3. AFTT MTE – Individual Marine Mammal and Sea Turtle Sighting Information: C2X w/ IAC 16 Jul – 4 Aug 2015

(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 not, contact area present
16 Jul 15	2125Z	CPOA	dolphin	5	VIS	DDG	1	3	10	N	<200	none	na	Mammals came to surface to breathe for approximately 5 seconds
16 Jul 15	1650Z	JAXOA	dolphin	2	VIS	Non-ASW ship	10	1	9	na	<200	none	na	nr
17 Jul 15	1735Z	CPOA	dolphin	2	VIS	Non-ASW ship	1	1	10	na	1000-2000	none	na	Dolphins swam along side of ship moving forward to aft
17 Jul 15	1650Z	JAXOA	dolphin	3	VIS	Non-ASW ship	3	1	10	na	200-500	none	na	nr
18 Jul 15	2000Z	VCOA	dolphin	20	VIS	DDG	2	1	10	N	<200	none	na	Bow riding dolphins
18 Jul 15	2030Z	VCOA	dolphin	10	VIS	DDG	12	1	10	N	>2000	none	na	Pod of dolphins playing to port
18 Jul 15	2014Z	VCOA	dolphin	1	VIS	DDG	10	0	9	N	>2000	none	na	Dolphin swimming on reciprocal course
18 Jul 15	1715Z	VCOA	dolphin	12	VIS	DDG	1	1	10	N	200-500	none	na	Pod of dolphins playing off bow
18 Jul 15	1443Z	CPOA	dolphin	9	VIS	Non-ASW ship	1	1	10	na	>2000	none	na	Dolphins sighted swimming off the stern
19 Jul 15	1755Z	VCOA	dolphin	15	VIS	DDG	2	1	10	N	<200	none	na	Pod of dolphins swimming off the stern
19 Jul 15	1446Z	VCOA	dolphin	10	VIS	DDG	5	1	10	N	<200	none	na	Pod of dolphins playing near stern, paralleling course
19 Jul 15	1330Z	CPOA	dolphin	6	VIS	Non-ASW ship	17	1	10	na	<200	none	na	Dolphins approached during RAS. Dolphins swam between ships during UNREP for approx 15

															mins. Dolphins were observed riding waves and jumping out of water
20 Jul 15	1348Z	CPOA	turtle	2	VIS	DDG	7	2	10	Y	200-500	Sonar shutdown	Turtle bearing 180R, opening ship	Swimming astern of ship	
23 Jul 15	1650Z	CPOA	dolphin	1	VIS	Non-ASW ship	3	1	10	na	200-500	none	na	nr	
24 Jul 15	1202Z	CPOA	dolphin	1	VIS	Non-ASW ship	5	2	10	na	500-1000	none	na	Dolphin surfaced briefly off starboard bow, paralleled our course for 5 minutes and submerged.	
24 Jul 15	2000Z	CPOA	dolphin	5	VIS	Non-ASW ship	3	1	10	na	200-500	none	na	nr	
26 Jul 15	2326Z	JAXOA	dolphin	3	VIS	DDG	1	2	10	N	<200	none	na	Observed three dolphins in the water	
27 Jul 15	1149Z	JAXOA	dolphin	7	VIS	DDG	5	1	10	N	200-500	none	na	Observed dolphins in the water	
28 Jul 15	1722Z	JAXOA	dolphin	1	VIS	Non-ASW ship	5	2	9	na	<200	none	na	nr	
29 Jul 15	2351Z	CPOA	dolphin	2	VIS	DDG	2	1	10	N	200-500	none	na	Dolphins swimming	
30 Jul 15	1810Z	JAXOA	dolphin	2	VIS	Non-ASW ship	5	2	10	na	200-500	none	na	Swam down length of ship and then outbound	
30 Jul 15	1108Z	JAXOA	dolphin	2	VIS	DDG	1	1	10	N	<200	none	na	2 Bowriding dolphins	
30 Jul 15	1045Z	JAXOA	dolphin	20	VIS	DDG	3	1	10	N	<200	none	na	nr	
31 Jul 15	1500Z	CPOA	dolphin	5	VIS	Non-ASW ship	5	4	10	na	<200	none	na	nr	
31 Jul 15	1205Z	CPOA	dolphin	3	VIS	Non-ASW ship	2	2	10	na	200-500	none	na	Swam down length of ship and then outbound	
31 Jul 15	1516Z	JAXOA	dolphin	13	VIS	Non-ASW ship	20	2	10	na	<200	none	na	Dolphins surfaced directly off starboard bow, paralleled our course for 20 minutes and submerged	
31 Jul 15	1517Z	JAXOA	dolphin	6	VIS	Non-ASW ship	10	3	10	na	<200	none	na	nr	
31 Jul 15	1857Z	JAXOA	dolphin	4	VIS	Non-ASW ship	3	3	10	na	<200	none	na	nr	
1 Aug 15	1200Z	CPOA	dolphin	5	VIS	Non-ASW ship	3	2	10	na	<200	none	na	nr	

2 Aug 15	1224Z	CPOA	dolphin	13	VIS	DDG	6	2	10	N	<200	none	na	nr
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nr=not reported; VIS=visual; ACO=acoustic; Y=yes; N=no; na=not applicable

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

Table 1-ii-4. AFTT MTE – Individual Marine Mammal and Sea Turtle Sighting Information: C2X w/ IAC 2 Sep – 29 Sep 2015

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)		
Date/time/location of sighting	Species	Number of individuals	Initial detection sensor	Indication of specific type of platform the observation was made from	Length of time observers maintained visual contact with marine mammal(s) (min)	Sea state (Beaufort scale)	Visibility (nm)	Sound source in use at time of sighting (Y/N)	Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000 yd from sound source	Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was	If source in use is hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animals,		
2 Sep 15	0923Z	JAXOA	dolphin	5	VIS	Non-ASW ship	5	2	10	na	500-1000	none	na	nr
2 Sep 15	0930Z	JAXOA	dolphin	3	VIS	Non-ASW ship	3	3	8	na	<200	none	na	nr
2 Sep 15	1023Z	JAXOA	dolphin	3	VIS	Non-ASW ship	nr	1	10	na	200-500	none	na	nr
2 Sep 15	1050Z	JAXOA	dolphin	5	VIS	DDG	5	3	10	N	<200	none	na	Swimming
2 Sep 15	1053Z	JAXOA	dolphin	2	VIS	DDG	1	2	10	N	<200	none	na	Swimming
2 Sep 15	1053Z	JAXOA	whale	1	VIS	DDG	2	2	10	N	<200	none	na	Blowing
2 Sep 15	1122Z	JAXOA	dolphin	10	VIS	DDG	60	1	7	N	200-500	none	na	A group of ten dolphins, two "calves" that were about half the size of the rest began bow riding and chasing flying fish for an hour while ship drove 5kts
2 Sep 15	1123Z	JAXOA	dolphin	3	VIS	Non-ASW ship	5	2	10	na	200-500	none	na	nr
3 Sep 15	1144Z	JAXOA	dolphin	2	VIS	DDG	5	1	7	N	200-500	none	na	nr
3 Sep 15	1155Z	JAXOA	dolphin	4	VIS	DDG	2	6	10	N	<200	none	na	Swimming
4 Sep 15	1211Z	VCOA	dolphin	2	VIS	DDG	2	1	10	N	<200	none	na	Frolicking, breaching
8 Sep 15	1222Z	JAXOA	dolphin	10	VIS	DDG	60	1	7	N	200-500	none	na	nr
10 Sep	1238Z	JAXOA	dolphin	4	VIS	Non-ASW	15	2	8	na	500-1000	none	na	nr

15						ship								
11 Sep 15	1308Z	JAXOA	dolphin	8	VIS	DDG	2	5	10	N	<200	none	na	Swimming
11 Sep 15	1312Z	JAXOA	dolphin	4	VIS	Non-ASW ship	20	2	8	na	500-1000	none	na	nr
12 Sep 15	1352Z	JAXOA	dolphin	10	VIS	DDG	5	2	7	N	<200	none	na	Swimming
12 Sep 15	1425Z	VCOA	dolphin	2	VIS	DDG	5	1	10	N	200-500	none	na	Jumping
12 Sep 15	1450Z	VCOA	dolphin	4	VIS	DDG	5	1	10	N	200-500	none	na	Jumping
12 Sep 15	1510Z	JAXOA	dolphin	2	VIS	DDG	1	1	10	N	<200	none	na	Swimming
14 Sep 15	1519Z	VCOA	dolphin	4	VIS	DDG	1	1	10	N	500-1000	none	na	Breaching, jumping
14 Sep 15	1545Z	VCOA	dolphin	10	VIS	DDG	10	1	10	N	200-500	none	na	Jumping
14 Sep 15	1553Z	VCOA	dolphin	6	VIS	DDG	20	1	10	N	>2000	none	na	Swimming
14 Sep 15	1557Z	VCOA	dolphin	45	VIS	DDG	15	1	5	N	1000-2000	none	na	A large pod of dolphins swimming in a group moving from north of Thimble shoals channel towards the channel (course 180T), they were jumping and surfacing freely
15 Sep 15	1740Z	CPOA	dolphin	3	VIS	DDG	2	1	10	N	1000-2000	none	na	Frolicking, breaching
15 Sep 15	1745Z	VCOA	dolphin	5	VIS	DDG	20	1	10	N	500-1000	none	na	Swimming
16 Sep 15	1749Z	CPOA	dolphin	1	VIS	DDG	5	1	7	Y	200-500	Maneuvered away	Dolphin bearing 313R, crossing ship	What appeared to be a single dolphin passed by porpoising and behaving normal. Ship turned and continued to observe
16 Sep 15	1834Z	CPOA	dolphin	1	VIS	DDG	1	1	10	N	<200	none	na	Breaching, jumping
18 Sep 15	1843Z	JAXOA	turtle	1	VIS	DDG	1	1	10	N	500-1000	none	na	Swimming

18 Sep 15	1956Z	JAXOA	dolphin	20	VIS	DDG	3	1	10	N	200-500	none	na	Breaching, jumping
20 Sep 15	2013Z	JAXOA	dolphin	3	VIS	DDG	5	1	5	N	200-500	none	na	Swimming
21 Sep 15	2133Z	JAXOA	dolphin	3	VIS	DDG	2	1	7	N	200-500	none	na	Three dolphins appeared off the port side and conducted bow riding for two minutes and then disappeared
21 Sep 15	2220Z	JAXOA	dolphin	2	VIS	DDG	5	1	10	N	<200	none	na	Swimming
25 Sep 15	2229Z	JAXOA	dolphin	6	VIS	DDG	2	3	8	N	<200	none	na	Breaching, jumping
27 Sep 15	2233Z	JAXOA	dolphin	20	VIS	DDG	2	1	10	N	200-500	none	na	Swimming
27 Sep 15	2320Z	JAXOA	dolphin	2	VIS	DDG	1	2	8	N	<200	none	na	Swimming

nr=not reported; VIS=visual; ACO=acoustic; Y=yes; N=no; na=not applicable
 VCOA=Virginia Capes Operating Area; CPOA=Cherry Point Operating Area; JAXOA=Jacksonville Operating Area

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

Between 14 November 2014 and 13 November 2015, there were a total of seven major training exercises, including three C2X and four IAC.

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

MTE Type	Month	# of Exercise Days	# of Ships Involved (MFAS and non-MFAS)	# of Sightings	# of Animals
C2X w/ IAC	Jan – Feb 2015	30	18	31	222
IAC	Feb – Mar 2015	13	6	10	57
C2X w/ IAC	Jul – Aug 2015	20	10	30	190
C2X w/ IAC	Sep 2015	28	17	35	216
	Total	91	51	106	685

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 a total of 3 sightings of at least 21 marine animals for all AFTT MTE sightings at ranges less than 1,000 yards during which active sonar was in use. These 3 sightings included 2 sightings of 19 dolphins and 1 sighting of 2 turtles. (Table 1-iii-2).

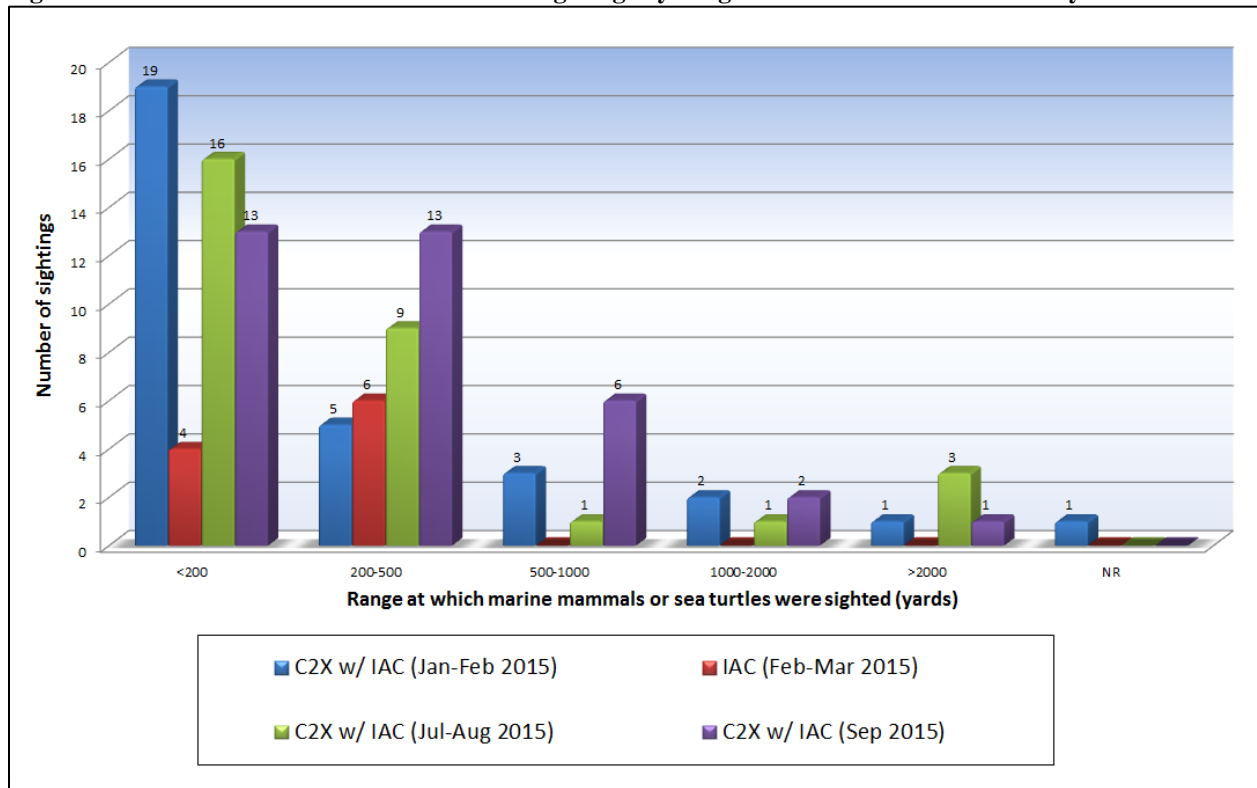
Table 1-iii-2. Breakdown of marine mammals and sea turtles sighted in the AFTT Study Area during MTEs at ranges less than 1000 yards concurrent with active sonar use

Range	< 200 yards	200 – 500 yards	500 – 1000 yards
Dolphins	18	1	0
Whales	0	0	0
Pinnipeds	0	0	0
Turtles	0	2	0
Total marine animals	18	3	0

For AFTT MTEs, there were a total of 2 mitigation events when sonar was shut off or powered down during ASW training. In both cases, active sonar was secured due to marine animals observed within the 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 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 the mitigation conducted

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 1µPa) ¹	11) Number of minutes sonar mitigation applied	12) Estimate exposure AFTER mitigation (dB re 1µPa) 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
CPOA	C2X w/ IAC	Jan	dolphin	18	DDG	15	<200	Sonar shutdown	<189	6	None	2,000	Dolphins bearing 353R, paralleling ship	Swimming ivo ship, potentially on transit. Nothing unusual to report although limited jumping and interaction with bow wave observed
CPOA	C2X w/ IAC	Jul	turtle	2	DDG	7	200-500	Sonar shutdown	<181-189	10	None	3,333	Turtle bearing 180R, opening ship	Swimming astern of ship

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 $20\log R$ (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 the sound waves can become trapped by the sea surface and bottom 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 $(10\log R2/R1)$, 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. By the time the wave has propagated to 2000 yards, the sonar signal strength has decreased by a 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 (blue 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 2014 to 13 November 2015, 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 (14Nov14- 13Nov15)	Actual Usage (14Nov14- 13Nov15)	% 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	35 detonations	<1%
E2	Medium-caliber projectiles	856 detonations	0	0%
E3	Large-caliber projectiles	3,132 detonations	1 detonation	<1%
E4	Improved Extended Echo Ranging sonobuoy	2,190 detonations	14 detonations	<1%
E5	5-inch projectiles	14,370 detonations	93 detonations	<1%
E6	15 lb. shaped charge	500 detonations	35 detonations	7%
E7	40 lb. demo block / shaped charge	322 detonations	0	0%
E8	250 lb. bomb	77 detonations	2 detonations	3%
E9	500 lb. bomb	2 detonations	0	0%
E10	1,000 lb. bomb	8 detonations	0	0%
E11	650 lb. mine	1 detonation	0	0%
E12	2,000 lb. bomb	133 detonations	50 detonations	38%
(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	0%
E4	Improved Extended Echo Ranging sonobuoy	2 detonations	0	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)	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	1,130	1,412	49,220 hours	*	*
MF1K	13	12	815 hours	*	*
MF2	128	1	15,750 hours	*	*
MF2K	0	0	305 hours	*	*
MF3	27	101	10,290 hours	*	*
MF4	45	49	4,635 hours	*	*
MF5	411	1,096	72,780 buoys	*	*
MF11	34	2	4,000 hours	*	*

MF12	0	0	3,435 hours	*	*
HF1	18	27	8,380 hours	*	*
HF4	15	3	42,320 hours	*	*
ASW1	0	0	640 hours	*	*
ASW2	18	184	13,100 buoys	*	*
ASW3	21	38	67,930 hours	*	*
ASW4	4	1	6,825 devices	*	*
TORP1	0	0	270 torpedoes	*	*
TORP2	10	18	400 torpedoes	*	*
(2) Explosive Sources Used During Annual Training					
E1	55	35	622,760 detonations	90	<1%
E2	0	0	4,280 detonations	0	0%
E3	0	1	15,660 detonations	1	<1%
E4	16	14	10,950 detonations	30	<1%
E5	115	93	71,850 detonations	208	<1%
E6	25	35	2,500 detonations	60	2%
E7	0	0	1,610 detonations	0	0%
E8	6	2	385 detonations	8	2%
E9	0	0	10 detonations	0	0%
E10	2	0	40 detonations	2	5%
E11	0	0	5 detonations	0	0%
E12	28	50	665 detonations	78	12%
(3) Active Acoustic Sources Used During Non-Annual Training					
HF4	0	0	960 hours	*	*
(4) Explosive Sources Used During Non-Annual Training					
E2	0	0	10 detonations	0	0%
E4	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

Pile driving was conducted from 7 August to 24 August 2015 with vibratory removal from 9 September to 16 September 2015 at Joint Expeditionary Base Little Creek-Fort Story during Elevated Causeway System (ELCAS) 2015. There were no instances of marine mammals or sea turtles observed within the mitigation zone during these events.

(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 2014 to 13 November 2015, 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 (14Nov14- 13Nov15)	Actual Usage (14Nov14- 13Nov15)	% 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	0%
E2	Medium-caliber projectiles	0 detonations	-	-
E3	Large-caliber projectiles	2,912 detonations	0	0%
E4	Improved Extended Echo Ranging sonobuoy	1,432 detonations	0	0%
E5	5-inch projectiles	495 detonations	0	0%
E6	15 lb. shaped charge	54 detonations	8 detonations	15%
E7	40 lb. demo block / shaped charge	0 detonations	-	-
E8	250 lb. bomb	11 detonations	0	0%
E9	500 lb. bomb	0 detonations	-	-
E10	1,000 lb. bomb	10 detonations	0	0%
E11	650 lb. mine	27 detonations	0	0%
E12	2,000 lb. bomb	0 detonations	-	-
E13	1,200 lb. HBX	0 detonations	-	-
E14	2,500 lb. HBX	4 detonations	0	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	0%
E16	10,000 lb. HBX	12 detonations	0	0%
E17	40,000 lb. HBX	4 detonations	0	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)	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	0	28	1,270 hours	*	*
LF5	22	0	1,850 hours	*	*
MF1	0	0	1,100 hours	*	*

MF1K	0	0	95 hours	*	*
MF2	0	0	180 hours	*	*
MF3	13	0	2,170 hours	*	*
MF4	5	2	3,880 hours	*	*
MF5	152	184	20,920 buoys	*	*
MF6	1	6	1,515 items	*	*
MF8	0	0	450 hours	*	*
MF9	89	208	65,170 hours	*	*
MF10	34	0	5,335 hours	*	*
MF12	0	0	720 hours	*	*
HF1	6	0	6,215 hours	*	*
HF3	1	3	1,920 hours	*	*
HF4	210	420	27,860 hours	*	*
HF5	57	100	6,030 hours	*	*
HF6	40	1	9,870 hours	*	*
HF7	19	0	1,830 hours	*	*
ASW1	0	0	480 hours	*	*
ASW2	263	500	13,715 buoys	*	*
ASW2	59	14	1,370 hours	*	*
ASW3	13	0	4,740 hours	*	*
ASW4	0	0	2,415 devices	*	*
TORP1	2	0	2,905 torpedoes	*	*
TORP2	0	0	2,605 torpedoes	*	*
M3	1	12	2,305 hours	*	*
SD1/SD2	0	0	1,150 hours	*	*
FLS2/FLS3	0	27	1,825 hours	*	*
SAS1	0	0	30 hours	*	*
SAS2	0	11	17,120 hours	*	*
(2) Explosive Sources Used During Annual Testing					
E1	0	0	127,505 detonations	0	0%
E2	-	-	0 detonations	-	-
E3	0	0	14,560 detonations	0	0%
E4	12	0	7,160 detonations	12	<1%
E5	5	0	2,475 detonations	5	<1%
E6	0	8	270 detonations	8	3%
E7	-	-	0 detonations	-	-
E8	0	0	55 detonations	0	0%
E9	-	-	0 detonations	-	-
E10	0	0	50 detonations	0	0%
E11	0	0	135 detonations	0	0%
E12	-	-	0 detonations	-	-
E13	-	-	0 detonations	-	-
E14	0	0	20 detonations	0	0%

(3) Active Acoustic Sources Used During Non-Annual Testing					
LF5	0	0	1,200 hours	*	*
MF9	0	0	2,400 hours	*	*
HF5	0	0	1,200 hours	*	*
HF6	0	0	3,600 hours	*	*
HF7	0	0	1,200 hours	*	*
FLS2/FLS3	0	0	1,200 hours	*	*
SAS2	0	0	3,600 hours	*	*
(4) Explosive Sources Used During Non-Annual Testing					
E1	0	0	3,000 detonations	0	0%
E16	0	0	60 detonations	0	0%
E17	0	0	20 detonations	0	0%

* Information is presented in the unclassified 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.