

Prepared for and submitted to:

National Marine Fisheries Service
Office of Protected Resources

Prepared by:

Department of the Navy

In accordance with the Letter of Authorization
Under the MMPA and ITS authorization under
the ESA

1 February 2012

UNCLASSIFIED

Annual Range Complex Exercise Report

2 August 2011 to 1 August 2012

**For The U.S. Navy's
Atlantic Fleet Active Sonar Training (AFAST)
Study Area**

1 October 2012

UNCLASSIFIED

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ATLANTIC FLEET ACTIVE SONAR TRAINING STUDY AREA

INTRODUCTION

The U.S. Navy prepared this Annual Range Complex Exercise Report covering the period from 2 August 2011 to 1 August 2012 in compliance with the National Marine Fisheries Service (NMFS) Final Rule under the Marine Mammal Protection Act (MMPA) for the Atlantic Fleet Active Sonar Training (AFAST) Study Area (NMFS 2009).

In the AFAST Range Complex Final Rule and Letters of Authorization¹ “Requirements for monitoring and reporting” the following report subsections were specified and are present within this report:

- (1) Mid-Frequency Active Sonar (MFAS)/High-Frequency Active Sonar (HFAS) Major Training Exercise for Reporting (MTER).
 - (i) Exercise Information (for each MTER)
 - (ii) Individual Marine Mammal and Sea Turtle Sighting Information (for each MTER).
 - (iii) Evaluation (based on data gathered during all MTERs) of effectiveness of mitigation measures designed to avoid exposing marine animals to MFAS. This evaluation shall identify the specific observations that support any conclusion the Navy reaches about the effectiveness of the mitigation.

- (2) Anti-submarine Warfare (ASW) Summary
 - (i) Total annual hours of each type of sonar source
 - (ii) Cumulative Impact Report

- (3) Improved Extended Echo Ranging (IEER) / Advanced Extended Echo Ranging (AEER) Summary
 - (i) Total number of IEER and AEER events conducted in the AFAST Study Area
 - (ii) Total expended/detonated rounds (buoys)
 - (iii) Total number of self-scuttled IEER rounds

This Annual Report covers the period from 2 August 2011 to 1 August 2012, and the information represents the best practical data collection for this period. The data collection and reporting timeline differ from the actual LOA dates, so in an effort to provide a better representation of annual exercise data for the AFAST Study Area, the Navy has combined all exercise data from 2 August 2011 to 1 August 2012 and compared it to the annual allocations provided in the 1 February 2012 AFAST Letter of Authorization. This representation of annual exercise data shall be repeated in future Annual Reports. To provide accounting for the entire five year period of the authorization, Navy will also submit a final report at the end of the five years to provide comprehensive totals of authorized usage.

¹AFAST:§216.245(f) (1) through (f) (3) of the Final Rule and 7(f) of the Letter of Authorization

(1) AFAST – MFAS/HFAS Major Training Exercise Summary

This section summarizes authorized sonar use and marine mammal observations from MTERs conducted within the AFAST Study Area during the reporting period. The AFAST MTERs include *Southeastern ASW Integrated Training Initiative* exercises (SEASWITI), *Integrated ASW Course Phase II* (IAC II), *Composite Training Unit Exercises* (C2X) and *Joint Task Force Exercises* (JTFEX).

(i) Exercise information

Table 1-i-1. MTERs conducted in the AFAST Study Area.

(A) Exercise designator	(B) Date	(C) Locations	(D) # and types of active sources used								(E) # and types of passive sources used								(F) # and types of vessels and aircraft participating						(G) Total hours of observation by watchstanders	(H) Total hours of all active sources	(I) Total hours of each active source							(J) Wave height (high, low, and average) (ft)
			SQS-53	SQS-56	BQQ-10 or 5	AQS-22 or 13	SSQ-62 Sonobuoys	SLQ-25 NIXIE	BQS-15	SQS-53	SQS-56	Towed Array	BQQ-10 or 5	AQS-22 or 13	BQS-15	SSQ-53 Sonobuoys	CG	DDG	FFG	SH-60F \MH-60R dipping helo	SH-60B non-dipping helo	Submarines	MPRA	Non-ASW surface ships			SQS-53	SQS-56	BQQ-10 or 5	AQS-22 or 13	SSQ-62 Sonobuoys	SLQ-25 NIXIE	BQS-15	
IAC II	16-18 Aug 2011	CPOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	1,440	*	*	*	*	*	*	*	*	*	5,3,4
C2X w/ IAC II	28 Nov-21 Dec 2011	CPOA/JAX	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	5	22,626	*	*	*	*	*	*	*	*	*	14,1,5
C2X w/ IAC II	11 Jan-3 Feb 2012	CPOA/JAX	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3	8,356	*	*	*	*	*	*	*	*	*	10,2,6
JTFEX	4-10 Feb 2012	CPOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3	2,436	*	*	*	*	*	*	*	*	*	10,2,6
C2X w/ IAC II	24 Apr-18 May 2012	JAX	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3	35,776	*	*	*	*	*	*	*	*	*	9,3,4
JTFEX	19-29 Jun 2012	CPOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	4,254	*	*	*	*	*	*	*	*	*	10,2,6

CPOA=Cherry Point Operating Area; JAX=Jacksonville Operating Area

*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. AFAST MTER – Individual Marine Mammal and Sea Turtle Sighting Information: IAC II 16-18 Aug 2011.

(A) Location of sighting	(B) Species	(C) # of individuals	(D) Calves observed (y/n)	(E) Initial detection sensor	(F) Platform detection from	(G) Length of time observed (min)	(H) Wave height (ft)	(I) Visibility (nm)	(J) Sonar source in use (y/n)	(K) Range (yds)	(L) Mitigation implemented	(M) If source in use (J) is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion relative to ship	(N) Observed behavior
CPOA	whale	2	N	VIS	DDG	16	2	10	Y	<200	Shut down sonar	Whales bearing 153, ship course 185, opening ship	Passed port side, opening
CPOA	dolphin	1	N	ACO	DDG	1	1	5	Y	na	Shut down sonar	Dolphin bearing nr, ship course 000, nr	Believed to be bowriding based on SQS-53 passive display

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

CPOA=Cherry Point Operating Area

Table 1-ii-2. AFAST MTER – Individual Marine Mammal and Sea Turtle Sighting Information: C2X w/ IAC II 28 Nov-21 Dec 2011.

(A) Location of sighting	(B) Species	(C) # of individuals	(D) Calves observed (y/n)	(E) Initial detection sensor	(F) Platform detection from	(G) Length of time observed (min)	(H) Wave height (ft)	(I) Visibility (nm)	(J) Sonar source in use (y/n)	(K) Range (yds)	(L) Mitigation implemented	(M) If source in use (J) is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion relative to ship	(N) Observed behavior
CPOA	dolphin	3	N	VIS	Non-ASW ship	7	1	10	na	<200	na	na	Paralleling
CPOA	dolphin	3	N	VIS	Non-ASW ship	2	1	10	na	500-1000	na	na	Paralleling
CPOA	dolphin	12	N	VIS	Non-ASW ship	1	2	10	na	<200	na	na	Bowriding
CPOA	dolphin	4	N	VIS	Non-ASW ship	1	2	10	na	<200	na	na	Diving
CPOA	dolphin	5	N	VIS	Non-ASW ship	10	1	10	na	<200	na	na	Paralleling
CPOA	dolphin	3	N	VIS	FFG	10	4	9	N	<200	na	na	Paralleling ship's course
CPOA	dolphin	5	N	VIS	FFG	6	3	9	N	<200	na	na	Paralleling ship's course
CPOA	turtle	1	N	VIS	Non-ASW ship	2	1	10	na	<200	na	na	Paralleling ship's course
CPOA	dolphin	6	N	VIS	Non-ASW ship	5	2	10	na	<200	na	na	Bowriding
CPOA	dolphin	4	N	VIS	Non-ASW ship	10	6	10	na	<200	na	na	Paralleling ship's course
CPOA	dolphin	25	N	VIS	Non-ASW ship	1	1	10	na	<200	na	na	Jumping, playing
CPOA	dolphin	10	N	VIS	Non-ASW ship	1	1	10	na	<200	na	na	Jumping, playing
CPOA	dolphin	12	N	VIS	Non-ASW ship	3	3	10	na	<200	na	na	Paralleling ship c/s
CPOA	dolphin	3	N	VIS	CG	10	3	10	N	<200	na	na	Moved down stbd side until out of sight
CPOA	dolphin	6	N	VIS	Non-ASW ship	5	1	10	na	<200	na	na	Floating
CPOA	dolphin	5	N	VIS	Non-ASW ship	1	3	10	na	<200	na	na	Crossing bow
CPOA	dolphin	3	N	VIS	Non-ASW ship	1	1	10	na	<200	na	na	Surfacing

CPOA	dolphin	6	N	VIS	Non-ASW ship	15	1	10	na	<200	na	na	Paralleling
CPOA	dolphin	2	N	VIS	FFG	5	2	8	N	<200	na	na	Bowriding
CPOA	dolphin	1	N	VIS	Non-ASW ship	1	2	10	na	1000-2000	na	na	Paralleling ship c/s
CPOA	dolphin	9	N	VIS	Non-ASW ship	5	3	10	na	<200	na	na	Paralleling ship c/s
CPOA	dolphin	2	N	VIS	Non-ASW ship	2	4	10	na	<200	na	na	Jumping, playing
CPOA	dolphin	3	N	VIS	CG	10	1	8	N	<200	na	na	Observed dolphins visually
CPOA	dolphin	3	N	VIS	Non-ASW ship	1	5	8	N	<200	na	na	Jumping, playing
CPOA	dolphin	4	N	VIS	Non-ASW ship	1	6	10	na	200-500	na	na	Bowriding
CPOA	dolphin	3	N	VIS	Non-ASW ship	25	10	10	na	<200	na	na	Paralleling ship c/s
CPOA	dolphin	8	N	VIS	Non-ASW ship	15	8	10	na	<200	na	na	Paralleling ship c/s
CPOA	turtle	1	N	VIS	Non-ASW ship	6	1	10	na	<200	na	na	Surfacing
CPOA	dolphin	9	N	VIS	Non-ASW ship	10	5	10	na	<200	na	na	Fin flipping
CPOA	dolphin	10	N	VIS	Non-ASW ship	2	6	10	na	<200	na	na	Surfacing
CPOA	dolphin	14	N	VIS	Non-ASW ship	5	7	10	na	<200	na	na	Paralleling ship c/s
CPOA	dolphin	5	N	VIS	Non-ASW ship	1	5	10	na	<200	na	na	Following
CPOA	dolphin	2	N	VIS	Non-ASW ship	2	2	10	na	<200	na	na	Moving fwd to aft
CPOA	dolphin	2	N	VIS	Non-ASW ship	5	1	10	na	<200	na	na	Paralleling
CPOA	dolphin	3	N	VIS	Non-ASW ship	2	1	10	na	<200	na	na	Paralleling ship c/s
CPOA	dolphin	12	N	VIS	Non-ASW ship	10	2	10	na	<200	na	na	Paralleling ship c/s
CPOA	dolphin	10	N	VIS	Non-ASW ship	5	1	10	na	<200	na	na	Surfacing
CPOA	dolphin	3	N	VIS	Non-ASW ship	1	1	10	na	<200	na	na	Diving
CPOA	dolphin	6	N	VIS	Non-ASW ship	5	1	10	na	200-500	na	na	Surfacing
CPOA	turtle	1	N	VIS	Non-ASW ship	1	1	10	na	<200	na	na	Surfacing

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

CPOA=Cherry Point Operating Area

Table 1-ii-3. AFAST MTER – Individual Marine Mammal and Sea Turtle Sighting Information: C2X w/ IAC II 11 Jan-3 Feb 2012.

(A) Location of sighting	(B) Species	(C) # of individuals	(D) Calves observed (y/n)	(E) Initial detection sensor	(F) Platform detection from	(G) Length of time observed (min)	(H) Wave height (ft)	(I) Visibility (nm)	(J) Sonar source in use (y/n)	(K) Range (yds)	(L) Mitigation implemented	(M) If source in use (J) is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion relative to ship	(N) Observed behavior
VCOA	whale	1	N	VIS	Non-ASW ship	2	3	10	na	nr	na	na	nr
VCOA	whale	1	N	VIS	Non-ASW ship	nr	3	10	na	200-500	na	na	nr
JAX	whale	1	N	VIS	CG	5	4	10	N	>2000	na	na	Breach fluke slap
VCOA	whale	2	N	VIS	DDG	5	1	6	N	1000-2000	Manuevered away	na	Observed spouts and flukes off port bow
VCOA	whale	1	N	VIS	DDG	4	3	7	N	200-500	Manuevered away	na	Opened ship from port to stbd
JAX	dolphin	5	N	VIS	CG	1	6	10	N	200-500	na	na	Crossing port to stbd
JAX	dolphin	4	N	VIS	DDG	10	2	10	N	<200	na	na	Passed astern then submerged
JAX	whale	1	N	VIS	CG	15	3	9	N	1000-2000	na	na	Spouting and diving
JAX	dolphin	4	N	VIS	DDG	45	2	10	N	<200	na	na	Bowriding
JAX	dolphin	7	N	VIS	DDG	4	1	10	N	<200	na	na	Closed toward bow, then continued past vessel
JAX	dolphin	3	N	VIS	Non-ASW ship	2	1	10	na	<200	na	na	Closed toward bow, then continued past vessel
JAX	dolphin	7	N	VIS	DDG	5	2	10	N	<200	na	na	Bowriding
JAX	whale	1	N	VIS	Non-ASW ship	5	3	10	na	>2000	na	na	nr
JAX	dolphin	7	N	VIS	Non-ASW ship	5	3	10	na	<200	na	na	Dolphins swam off the bow and departed in our next turn
JAX	dolphin	2	N	VIS	CG	1	2	10	N	<200	na	na	nr

JAX	dolphin	2	N	VIS	CG	1	3	10	N	<200	na	na	nr
JAX	dolphin	4	N	VIS	DDG	2	3	10	N	<200	na	na	Crossed ship's bow
JAX	dolphin	3	N	VIS	CG	1	3	10	N	200-500	na	na	nr
JAX	dolphin	15	N	VIS	Non-ASW ship	5	1	10	na	500-1000	na	na	Observed near breakwater in mayport
JAX	whale	1	N	VIS	CG	1	3	10	N	>2000	na	na	nr
JAX	whale	1	N	VIS	CG	1	3	10	N	200-500	na	na	Surface
JAX	dolphin	1	N	VIS	CG	1	3	10	N	<200	na	na	Surface
JAX	dolphin	5	N	VIS	CG	1	3	10	N	200-500	na	na	Blowing
JAX	dolphin	4	N	VIS	CG	5	3	10	N	500-1000	na	na	Bowriding
JAX	dolphin	3	N	VIS	CG	1	3	10	N	500-1000	na	na	Bowriding
JAX	dolphin	3	N	VIS	CG	3	3	10	N	200-500	na	na	nr
JAX	dolphin	5	N	ACO	CG	2	3	10	N	na	na	na	nr

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

VCOA=Virginia Capes Operating Area; JAX=Jacksonville Operating Area

Table 1-ii-4. AFAST MTER – Individual Marine Mammal and Sea Turtle Sighting Information: JTFEX 4-10 Feb 2012.

(A) Location of sighting	(B) Species	(C) # of individuals	(D) Calves observed (y/n)	(E) Initial detection sensor	(F) Platform detection from	(G) Length of time observed (min)	(H) Wave height (ft)	(I) Visibility (mm)	(J) Sonar source in use (y/n)	(K) Range (yds)	(L) Mitigation implemented	(M) If source in use (J) is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion relative to ship	(N) Observed behavior
CPOA	dolphin	1	N	VIS	CG	1	5	3	N	1000-2000	na	na	Surface
CPOA	dolphin	8	N	VIS	CG	5	5	10	N	>2000	na	na	Surface
CPOA	turtle	1	N	VIS	CG	2	2	8	N	1000-2000	na	na	Surface
CPOA	dolphin	10	N	VIS	CG	5	3	10	N	1000-2000	na	na	Surface
CPOA	dolphin	2	N	VIS	CG	10	3	10	N	>2000	na	na	Surface
CPOA	dolphin	4	N	VIS	CG	15	3	10	N	>2000	na	na	Surface
CPOA	dolphin	5	N	VIS	CG	5	4	10	N	500-1000	na	na	Paralleling
CPOA	dolphin	15	N	VIS	CG	5	3	10	N	200-500	na	na	nr
CPOA	whale	1	N	ACO	CG	nr	nr	nr	N	na	na	na	nr
CPOA	dolphin	15	Y	VIS	CG	30	3	10	N	500-1000	na	na	Bowriding
CPOA	whale	1	N	VIS	CG	2	3	10	N	500-1000	na	na	Paralleling
CPOA	dolphin	10	Y	VIS	CG	20	3	10	N	500-1000	na	na	Paralleling
CPOA	dolphin	15	N	VIS	CG	30	3	10	N	>2000	na	na	Surface
CPOA	whale	2	Y	VIS	DDG	1	nr	nr	N	>2000	na	na	Briefly surfaced and immediately submerged

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

CPOA=Cherry Point Operating Area

Table 1-ii-5. AFAST MTER – Individual Marine Mammal and Sea Turtle Sighting Information: C2X w/ IAC II 24 Apr-18 May 2012.

(A) Location of sighting	(B) Species	(C) # of individuals	(D) Calves observed (y/n)	(E) Initial detection sensor	(F) Platform detection from	(G) Length of time observed (min)	(H) Wave height (ft)	(I) Visibility (nm)	(J) Sonar source in use (y/n)	(K) Range (yds)	(L) Mitigation implemented	(M) If source in use (J) is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion relative to ship	(N) Observed behavior
CPOA	dolphin	25	N	VIS	CG	5	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	1	N	VIS	Non-ASW ship	1	2	10	na	>2000	na	na	Paralleling
CPOA	whale	1	N	VIS	Non-ASW ship	2	2	10	na	>2000	na	na	Paralleling
CPOA	dolphin	7	N	VIS	CG	10	3	10	N	>2000	na	na	Bowriding
CPOA	dolphin	5	N	VIS	DDG	3	6	8	N	<200	na	na	Bowriding
CPOA	dolphin	3	N	VIS	DDG	15	6	10	N	>2000	na	na	Heading west
CPOA	dolphin	5	N	VIS	DDG	1	8	9	N	200-500	na	na	Bowriding
CPOA	dolphin	10	N	VIS	DDG	5	5	7	N	200-500	na	na	Bowriding
CPOA	dolphin	2	N	VIS	CG	5	5	10	N	500-1000	na	na	Bowriding
CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	6	N	VIS	DDG	3	3	10	N	>2000	na	na	Heading south
CPOA	dolphin	3	N	VIS	DDG	15	6	10	N	1000-2000	na	na	Heading east
CPOA	whale	1	N	VIS	Non-ASW ship	1	2	10	N	1000-2000	na	na	Dorsal fin slowly rose and fell
CPOA	dolphin	5	N	VIS	DDG	15	6	10	N	1000-2000	na	na	Northwest
CPOA	whale	1	N	VIS	FFG	1	2	10	N	500-1000	na	na	Parallel
CPOA	dolphin	2	N	VIS	FFG	20	1	10	N	<200	na	na	Blowing
CPOA	dolphin	2	N	VIS	FFG	1	2	10	N	<200	na	na	Parallel

CPOA	dolphin	2	N	VIS	FFG	30	1	10	N	<200	na	na	Bowriding
CPOA	dolphin	5	N	VIS	CG	15	2	10	N	<200	na	na	Paralleling ship course
CPOA	dolphin	2	N	VIS	CG	2	2	10	N	500-1000	na	na	Jumping out of water
CPOA	dolphin	2	N	VIS	CG	5	2	10	N	<200	na	na	Paralleling ship course
CPOA	dolphin	3	N	VIS	CG	5	2	10	N	<200	na	na	Paralleling ship course
CPOA	whale	1	N	ACO	CG	1	2	10	N	na	na	na	Heard what sounded like a whale blowing
CPOA	dolphin	1	N	VIS	DDG	10	3	8	N	500-1000	na	na	Paralleling
CPOA	dolphin	4	N	VIS	FFG	1	3	10	N	<200	na	na	Parallel
CPOA	dolphin	5	N	VIS	FFG	15	1	8	N	<200	na	na	Bowriding
CPOA	dolphin	2	N	VIS	CG	5	2	7	N	<200	na	na	Jumping out of water near ship
CPOA	turtle	1	N	VIS	DDG	4	4	10	N	>2000	na	na	nr
CPOA	dolphin	2	N	VIS	CG	15	2	7	N	<200	na	na	Jumping out of the water
CPOA	dolphin	6	N	VIS	CG	3	2	10	N	<200	na	na	Jumping out of the water
CPOA	dolphin	20	N	VIS	DDG	10	3	8	N	<200	na	na	Bowriding
CPOA	dolphin	8	N	ACO	FFG	45	3	8	N	<200	na	na	Bowriding
CPOA	whale	1	N	VIS	CG	1	4	10	N	500-1000	na	na	Breathing
CPOA	dolphin	4	N	VIS	CG	10	4	10	N	200-500	na	na	Bowriding
CPOA	dolphin	3	N	VIS	CG	10	4	10	N	<200	na	na	Bowriding
CPOA	dolphin	10	N	VIS	DDG	10	3	10	N	200-500	na	na	Moved sw to westerly
CPOA	dolphin	7	N	VIS	CG	6	2	10	N	<200	na	na	Jumping out of the water
CPOA	dolphin	20	N	VIS	DDG	20	3	10	N	500-1000	na	na	Bowriding
CPOA	whale	1	N	VIS	CG	1	4	10	N	500-1000	na	na	Bowriding
CPOA	dolphin	2	N	VIS	Non-ASW ship	1	3	10	na	<200	na	na	Closing on ship to bow ride
CPOA	dolphin	5	N	VIS	DDG	1	1	10	N	<200	na	na	Jumping
CPOA	turtle	1	N	VIS	DDG	2	1	10	N	<200	na	na	Surfaced
CPOA	turtle	1	N	VIS	CG	1	2	10	N	<200	na	na	Surfaced

CPOA	dolphin	5	N	VIS	Non-ASW ship	5	3	10	na	1000-2000	na	na	Dorsal fins rising and falling in changing directions. Appeared to be feeding in a small area
CPOA	dolphin	1	N	VIS	DDG	3	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	2	N	VIS	FFG	10	3	10	N	<200	na	na	Parallel
CPOA	dolphin	5	N	VIS	CG	5	2	10	N	200-500	na	na	Jumping out of the water
CPOA	dolphin	1	N	VIS	DDG	1	1	10	N	<200	na	na	Jumping
CPOA	dolphin	6	N	VIS	DDG	5	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	6	N	VIS	DDG	5	3	10	N	<200	na	na	Bowriding
CPOA	whale	1	N	VIS	CG	2	2	10	N	<200	na	na	Swam away from ship
CPOA	dolphin	4	N	VIS	FFG	1	1	10	N	<200	na	na	Paralleling
CPOA	whale	1	N	VIS	CG	2	2	10	N	500-1000	na	na	Swimming away from ship
CPOA	whale	2	N	VIS	CG	4	2	10	N	500-1000	na	na	Paralleling ship course
CPOA	whale	1	N	VIS	CG	2	2	10	N	<200	na	na	Floating on surface
CPOA	whale	7	N	VIS	CG	4	2	10	N	<200	na	na	Swam towards ship then dove below surface
CPOA	dolphin	2	N	ACO	DDG	5	2	10	N	na	na	na	nr
CPOA	dolphin	2	N	ACO	DDG	5	2	10	N	na	na	na	nr
CPOA	dolphin	2	N	ACO	DDG	5	2	10	N	na	na	na	nr
CPOA	turtle	1	N	VIS	DDG	3	2	10	N	>2000	na	na	nr
CPOA	dolphin	10	N	VIS	DDG	3	2	10	N	>2000	na	na	nr
CPOA	dolphin	2	N	ACO	DDG	5	2	10	N	na	na	na	nr
CPOA	dolphin	10	N	VIS	DDG	5	2	10	N	500-1000	na	na	nr
CPOA	dolphin	1	N	VIS	CG	3	2	10	N	200-500	na	na	Swam away from ship
CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	2	N	ACO	DDG	5	2	10	N	na	na	na	nr
CPOA	dolphin	2	N	ACO	DDG	5	2	10	N	na	na	na	nr

CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	3	N	VIS	FFG	20	1	10	N	<200	na	na	Paralleling
CPOA	dolphin	3	Y	VIS	DDG	2	2	10	N	<200	na	na	nr
CPOA	dolphin	2	N	VIS	DDG	5	3	9	N	<200	na	na	Paralleling
CPOA	dolphin	7	N	VIS	DDG	10	3	9	N	<200	na	na	Opening
CPOA	dolphin	3	N	VIS	DDG	2	2	10	N	<200	na	na	Bowriding
CPOA	dolphin	2	N	VIS	FFG	1	2	10	N	<200	na	na	Paralleling
CPOA	turtle	1	N	VIS	CG	5	1	10	N	<200	na	na	Surfaced
CPOA	turtle	1	N	VIS	DDG	4500	3	10	N	>2000	na	na	nr
CPOA	dolphin	8	N	VIS	Non-ASW ship	3	4	10	na	200-500	na	na	Following ship and playing in wake
CPOA	turtle	1	N	VIS	DDG	1	1	10	N	<200	na	na	Swimming away from ship
CPOA	dolphin	20	N	VIS	DDG	1	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	2	N	VIS	DDG	5	2	10	N	<200	na	na	Bowriding
CPOA	dolphin	6	N	VIS	DDG	1	2	10	N	<200	na	na	Bowriding
CPOA	dolphin	5	N	VIS	DDG	3	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	12	N	VIS	DDG	2	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	3	N	VIS	DDG	1	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	6	N	VIS	DDG	2	2	10	N	500-1000	na	na	Bowriding
CPOA	dolphin	3	N	VIS	DDG	1	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	5	N	VIS	DDG	1	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	8	N	VIS	DDG	5	3	10	N	>2000	na	na	Sw
CPOA	dolphin	4	N	VIS	DDG	30	3	10	N	<200	na	na	nr
CPOA	dolphin	3	N	VIS	Non-ASW ship	1	1	10	na	<200	na	na	Swam near and began to follow ship at about 100 yds
CPOA	dolphin	2	N	VIS	Non-ASW ship	2	4	10	na	<200	na	na	Swam near ship
CPOA	dolphin	5	N	VIS	FFG	5	2	10	Y	500-1000	Maneuvered away	Dolphins bearing 220, ship course 205, paralleling ship	Parallel

CPOA	dolphin	4	N	VIS	DDG	5	2	10	N	<200	na	na	Bowriding
CPOA	dolphin	1	N	ACO	DDG	5	2	10	N	na	na	na	nr
CPOA	whale	5	Y	VIS	Non-ASW ship	5	3	10	na	200-500	na	na	Multiple blunt-nosed porposes or pilot whales, maneuvering away from ship.
CPOA	dolphin	4	N	VIS	Non-ASW ship	2	3	10	na	1000-2000	na	na	Surfaced & submerged showing dorsal fin & part of back, traveling toward ship
CPOA	dolphin	4	N	VIS	FFG	5	1	10	Y	>2000	na	Dolphins bearing 030, ship course 120, opening ship	Open
CPOA	whale	3	N	VIS	Non-ASW ship	2	1	10	na	500-1000	na	na	nr
CPOA	whale	3	N	VIS	Non-ASW ship	1	1	10	na	500-1000	na	na	Brief glimpse, unable to get more information
CPOA	generic	1	N	VIS	DDG	2	3	10	N	>2000	na	na	Blowing
CPOA	dolphin	1	N	VIS	DDG	5	2	8	N	<200	na	na	nr
CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	10	N	VIS	CG	25	1	10	N	<200	na	na	Bowriding
CPOA	dolphin	10	N	VIS	CG	25	1	10	N	<200	na	na	Bowriding
CPOA	dolphin	6	N	VIS	FFG	1	2	8	N	<200	na	na	Blowing
CPOA	dolphin	8	N	VIS	DDG	<1	3	10	N	<200	na	na	Swimming by ship
CPOA	dolphin	3	N	VIS	CG	3	2	8	N	<200	na	na	Swimming away from ship
CPOA	dolphin	1	N	VIS	DDG	1	4	10	N	<200	na	na	Bowriding
CPOA	dolphin	1	N	VIS	HELO	10	3	10	N	<200	na	na	nr
CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	6	N	VIS	DDG	2	2	10	N	<200	na	na	Bowriding
CPOA	dolphin	7	Y	VIS	CG	5	4	8	N	200-500	na	na	Playing in ship's bow wake
CPOA	dolphin	10	N	VIS	CG	15	3	10	N	<200	na	na	Bowriding

CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	15	Y	VIS	DDG	6	1	10	N	200-500	na	na	Bowriding
CPOA	dolphin	3	N	VIS	DDG	<1	1	10	N	<200	na	na	Bowriding
CPOA	dolphin	5	N	VIS	Non-ASW ship	5	1	10	na	500-1000	na	na	nr
CPOA	dolphin	2	Y	VIS	DDG	2	1	10	N	<200	Maneuvered away	na	Swimming by ship
CPOA	dolphin	1	N	VIS	FFG	2	2	10	N	200-500	na	na	Parallel
CPOA	dolphin	10	N	VIS	CG	10	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	1	N	ACO	DDG	nr	4	10	N	na	na	na	nr
CPOA	dolphin	1	N	VIS	CG	nr	Nr	nr	Y	<200	Shut down sonar	Dolphin bearing nr, ship course 180, paralleling ship	Unreported number of dolphins spotted close aboard
CPOA	dolphin	4	N	VIS	DDG	5	1	10	N	200-500	na	na	Swimming by ship
CPOA	dolphin	5	N	VIS	DDG	2	4	10	Y	500-1000	Powered down sonar	Dolphins bearing 350, ship course 090, opening ship	Blowing
CPOA	dolphin	5	Y	VIS	DDG	3	5	10	Y	500-1000	Powered down sonar	Dolphins bearing 351, ship course 090, opening ship	Blowing
CPOA	whale	1	N	VIS	CG	7	2	10	N	<200	na	na	Surfaced
CPOA	dolphin	3	N	VIS	DDG	5	1	10	N	<200	na	na	Swimming by ship
CPOA	dolphin	3	N	VIS	DDG	3	4	10	Y	500-1000	Shut down sonar	Dolphins bearing 350, ship course 004, closing	nr
CPOA	dolphin	2	N	VIS	Non-ASW ship	1	10	10	na	500-1000	na	na	Diving / playing in aft wake
CPOA	dolphin	5	N	VIS	Non-ASW ship	10	6	10	na	500-1000	na	na	Approached off stbd bow and jumped in wake, several feet into air with whole body out of water
CPOA	turtle	1	N	VIS	DDG	5	2	10	N	200-500	na	na	Swimming by ship
CPOA	dolphin	12	Y	VIS	DDG	1	3	10	N	<200	na	na	Jumping
CPOA	turtle	1	N	VIS	DDG	2	1	10	N	<200	na	na	Swimming by ship
CPOA	turtle	1	N	VIS	DDG	1	2	10	N	<200	na	na	Swimming by ship
CPOA	turtle	1	N	VIS	DDG	3	3	10	N	<200	na	na	Swimming by ship

CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	3	N	VIS	DDG	1	2	10	N	<200	na	na	Bowriding
CPOA	turtle	1	N	VIS	CG	1	2	10	N	<200	Manuevered away	na	Floating
CPOA	dolphin	1	N	VIS	CG	1	2	10	N	<200	Manuevered away	na	Floating to bow
CPOA	dolphin	2	N	VIS	HELO	1	2	13	N	<200	na	na	nr
CPOA	dolphin	20	N	VIS	DDG	5	2	10	N	<200	na	na	Bowriding
CPOA	dolphin	2	N	VIS	CG	1	2	10	N	<200	Manuevered away	na	Closing to bow
CPOA	dolphin	25	N	VIS	DDG	1	2	10	N	200-500	na	na	Jumping
CPOA	dolphin	1	N	ACO	DDG	nr	2	10	N	na	na	na	nr
CPOA	dolphin	6	N	VIS	DDG	2	3	10	N	<200	na	na	Bowriding
CPOA	dolphin	3	N	VIS	FFG	5	3	10	N	200-500	na	na	Parallel
CPOA	dolphin	2	N	VIS	DDG	1	3	10	N	<200	na	na	Jump
CPOA	dolphin	2	N	VIS	FFG	1	3	10	N	<200	na	na	Swam along port beam
CPOA	turtle	1	N	VIS	Non-ASW ship	5	1	10	na	200-500	na	na	nr
CPOA	dolphin	3	N	VIS	DDG	3	2	10	N	<200	na	na	Bowriding
CPOA	dolphin	3	N	VIS	CG	2	2	10	N	<200	na	na	Blowing
CPOA	whale	4	N	VIS	CG	3	3	10	N	<200	na	na	Swimming
CPOA	dolphin	6	N	VIS	CG	2	3	10	N	<200	na	na	Swimming
CPOA	whale	6	N	VIS	DDG	5	2	10	N	<200	na	na	Bowriding
CPOA	dolphin	10	N	VIS	FFG	2	3	10	N	200-500	Manuevered away	na	Crossing port to stbd
CPOA	dolphin	5	N	VIS	CG	1	5	10	N	<200	na	na	Swimming
CPOA	dolphin	45	Y	VIS	FFG	4	3	10	N	200-500	Manuevered away	na	Passing stern to bow
CPOA	dolphin	3	N	VIS	CG	3	2	10	N	<200	na	na	Paralleling
CPOA	dolphin	25	Y	VIS	FFG	3	3	10	N	200-500	Manuevered away	na	Crossing stbd to port
CPOA	dolphin	2	N	VIS	FFG	2	3	10	N	<200	Manuevered away	na	Crossing stbd to port
CPOA	dolphin	2	N	VIS	FFG	11	2	10	N	<200	na	na	Bowriding

CPOA	dolphin	1	N	ACO	DDG	nr	2	10	Y	na	na	Dolphin bearing nr, ship course 180, nr	nr
CPOA	dolphin	40	Y	VIS	FFG	2	4	10	N	<200	Manuevered away	na	Crossing stern to bow
CPOA	dolphin	4	Y	VIS	CG	3	1	10	N	200-500	na	na	Logging
CPOA	dolphin	20	Y	VIS	CG	4	1	10	N	>2000	na	na	Swimming

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

CPOA=Cherry Point Operating Area

Table 1-ii-6. AFAST MTER – Individual Marine Mammal and Sea Turtle Sighting Information: JTFEX 19-29 Jun 2012.

(A) Location of sighting	(B) Species	(C) # of individuals	(D) Calves observed (y/n)	(E) Initial detection sensor	(F) Platform detection from	(G) Length of time observed (min)	(H) Wave height (ft)	(I) Visibility (mm)	(J) Sonar source in use (y/n)	(K) Range (yds)	(L) Mitigation implemented	(M) If source in use (J) is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion relative to ship	(N) Observed behavior
CPOA	dolphin	20	N	VIS	CG	10	2	10	N	<200	na	na	Bowriding
CPOA	whale	2	N	VIS	DDG	14	2	10	Y	500-1000	Shut down sonar	Whales bearing 135, ship course 300, opening ship	Moving away from ship
CPOA	whale	1	N	VIS	DDG	20	2	10	Y	>2000	Manuevered away	Whale bearing 025, ship course 000, opening ship	Surface
CPOA	dolphin	13	N	VIS	CG	4	2	10	N	500-1000	na	na	Crossing the bow
CPOA	dolphin	1	N	VIS	FFG	1	3	10	N	<200	na	na	Air to dive
CPOA	dolphin	6	N	VIS	DDG	1	2	10	N	>2000	na	na	Parallelling
CPOA	dolphin	7	N	VIS	CG	5	4	10	N	<200	na	na	Bowriding

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

CPOA=Cherry Point Operating Area

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

Between 2 August 2011 and 1 August 2012, there were a total of nine major training exercises, including four IAC II, three C2X, and two JTFEX.

Table 1-iii-1. AFAST MTERs and associated animal sightings.

MTER Type	Month	# of Exercise Days	# of Ships Involved (MFAS and non-MFAS)	# of Animal Sightings	# of Animals
IAC II	Aug 2011	3	4	2	2
C2X w/ IAC II	Nov-Dec 2011	24	10	40	229
C2X w/ IAC II	Jan-Feb 2012	24	9	27	94
JTFEX	Feb 2012	7	9	14	90
C2X w/ IAC II	Apr-May 2012	25	11	166	815
JTFEX	Jun 2012	11	7	7	50
	Total	94	50	256	1,280

Mitigation Effectiveness Discussion

The three categories of mitigation measures (Personnel Training, Lookout and Watchstander Responsibility, and Operating Procedures) outlined in the AFAST EIS/OEIS and approved by NMFS (DoN 2008, NMFS 2011, 2012) were effective in detecting and appropriately mitigating exposure of marine mammal and sea 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 safety 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 6 sightings of at least 18 marine mammals for all AFAST MTER sightings at ranges less than 1,000 yards during which MFAS was in use. Of these 6 MTER MFAS sightings, there were 4 sightings of 14 dolphins, 2 sightings of 4 whales, and 0 sightings of pinnipeds or turtles. (Table 1-iii-2).

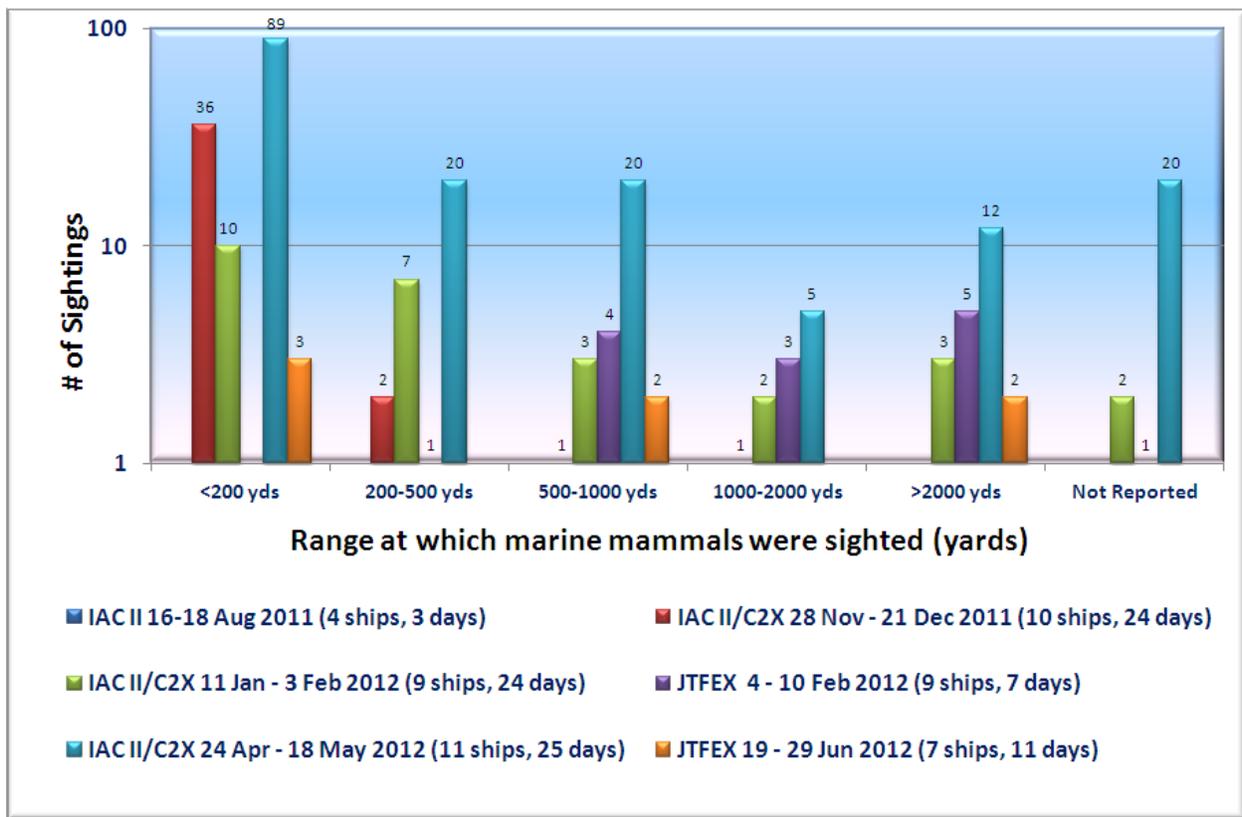
Table 1-iii-2. Breakdown of marine mammals and sea turtles sighted in the AFAST study area during MTERs at ranges less than 1000 yards concurrent with MFAS use.

Range	< 200 yards	200 – 500 yards	500 – 1000 yards
Dolphins	1	0	13
Whales	2	0	2
Pinnipeds	0	0	0
Turtles	0	0	0
Total marine mammals	3	0	15

For AFAST MTERs, there were a total of 5 mitigation events when sonar was shut off during ASW training. During three of these mitigations sonar was unnecessarily shut down, twice due to the observed range of a whale being in excess of 200 yards, and once due to passively receiving mammal vocalizations where the range to the mammal could not be determined.

Figure 1-iii-1 depicts the reported ranges of all marine mammal or sea turtle sightings (with and without MFAS) from each of nine MTERs within the AFAST Study Area. The number of sightings is variable by strike group, exercise type, and sea state at the time of the MTER.

Figure 1-iii-1. Marine mammal and sea turtle sightings by range and MTER in the AFAST Study Area.



Deep diving animals were not observed during any of the MTERs. 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 ship MFAS use, and even less so from less frequent and lower power aviation deployed MFAS systems (dipping sonar, sonobuoys). For instance, during a one hour dive by a beaked whale or sperm whale, a MFAS 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 observed range was less than 1,000 yards. It should be noted that with or without mitigation, given the relative motion of ships maneuvering at-sea and the independent marine mammal movement, the time any given animal would be exposed to MFAS 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 mammals at ranges less than 1,000 yards, and the mitigation conducted.

1) OpArea (JAX (J); CPOA (C); VCOA (V))	2) MTER	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 [secure (SD); power down (PD); maneuver ship (MAN)]	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 (J) is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion relative to ship	15) Observed behavior
CPOA	IAC II	AUG	whale	2	DDG	16	<200	Sonar shutdown	<189	23	None	7,667	Whales bearing 153, ship course 185, opening ship	Passed port side, opening
CPOA	C2X	MAY	dolphin	1	CG	nr	<200	Sonar shutdown	<189	5	None	1,667	Dolphin bearing nr, ship course 180, paralleling ship	Unreported number of dolphins spotted close aboard
CPOA	C2X	MAY	dolphin	5	DDG	2	500-1000	Sonar powerdown	<175-181	3	<169-175	1,000	Dolphins bearing 350, ship course 090, opening ship	Blowing
CPOA	C2X	MAY	dolphin	5	DDG	3	500-1000	Sonar powerdown	<175-181	4	<169-175	1,333	Dolphins bearing 351, ship course 090, opening ship	Blowing
CPOA	C2X	MAY	dolphin	3	DDG	3	500-1000	Sonar shutdown	<175-181	5	None	1,667	Dolphins bearing 350, ship course 004, closing ship	nr
JAX	JTFEX	JUN	whale	2	DDG	14	500-1000	Sonar shutdown	<175-181	12	None	4,000	Whales bearing 135, ship course 300, opening ship	Moving away from ship

Notes:

¹ Estimated exposure based on 20Log[R] spherical spreading propagation loss for ranges less than 1000 yards and where nominal MFAS Source Level (SL) assumed to be 235 dB for DDGs and 225 for FFGs (Urick 1982). Actual operating parameters and oceanographic condition likely result in 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.

nr = not reported

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 (Urlick 1982)]. Spherical spreading loss in the first 1000 yards equates to 60 dB of loss. At ranges between 1000 and 2000 yards the sound waves become trapped by the sea surface and bottom and cannot expand vertically. The spreading wave then forms an expanding cylinder. Cylindrical spreading loss in dB between two points can be calculated by using the formula $(10\log R_2/R_1)$, 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 active 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 mammal 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 determinations of marine mammal range 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 mammals that are vocalizing (i.e., making underwater sound as part of communication and echolocation). Marine mammal 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 mammals 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 mammal vocalization can be detected, it does not mean the mammal is necessarily close to the passive sonar sensor. Determining when or if a marine mammal is within a mitigation zone by passive acoustic detection is not always 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 (DoN 2008, NMFS 2009). However, many of the ESA-listed species in AFAST, 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 AFAST 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. For all marine mammal sightings made by Navy platforms during AFAST MTERs (**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, or foraging.

(2) AFAST – Annual ASW Summary**(i) Total annual hours of each type of sonar source**

This section summarizes total annual hours of each type of sonar source used within AFAST between 2 August 2011 to 1 August 2012 from MTERs and non-major training exercises such as unit-level training.

Table 2-i-1. Sonar usage within the AFAST Study Area by source.

Authorized MFAS sources §216.170 (c)(1) of NMFS AFAST Final Rule and LOA	22 Jan 2011 – 21 Jan 2012 (MTER + ULT)	2 Aug 2011 – 21 Jan 2012 (MTER + ULT)	22 Jan 2012 – 1 Aug 2012 (MTER + ULT)	2 Aug 2011 – 1 Aug 2012 (MTER + ULT)	Annually Authorized	% Total Used of Total Authorized (2 Aug 2011 – 1 Aug 2012)
(i) AN/SQS-53 surface ship hull-mounted active sonar (hours)	*	*	*	*	3,214	*
(ii) AN/SQS-56 surface ship hull-mounted active sonar (hours)	*	*	*	*	1,684	*
(iii) AN/SQS-56/53 hull-mounted sonar in object detection mode (hours)	*	*	*	*	216	*
(iv) AN/BQQ-10 or 5 submarine active sonar (# of pings) *	*	*	*	*	9,976	*
(v) AN/AQS-22 or 13 helicopter active dipping sonar (# of dips) **	*	*	*	*	2,952	*
(vi) AN/SSQ-62 DICASS acoustic sonobuoy (# of buoys) ***	*	*	*	*	5,853	*
(vii) Mk-48 heavyweight torpedoes (# of torpedoes)	*	*	*	*	32	*
(viii) Mk-46 or 54 lightweight torpedoes (# of torpedoes)	*	*	*	*	24	*
(ix) AN/SSQ-110A IEER explosive sonobuoy (# of buoys)	*	*	*	*	1,725	*
(x) AN/SSQ-125 AEER sonobuoy (# of buoys)	*	*	*	*	1,550	*
(xi) AN/SLQ-25 NIXIE towed countermeasure (hours)	*	*	*	*	2,500	*
(xii) AN/BQS-15 submarine navigation (hours)	*	*	*	*	450	*
(xiii) MK-1/2/3/4 Acoustic Device Countermeasures (# of ADCs)	*	*	*	*	225	*
(xiv) Noise Acoustic Emitters (# of NAEs)	*	*	*	*	127	*

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

(ii) Cumulative Impact Report

From NMFS Final Rule: *“To the extent practicable, the Navy, in coordination with NMFS, shall develop and implement a method of annually reporting non-major (i.e., other than MTERs) training exercises utilizing hull-mounted sonar. The report shall present an annual (and seasonal, where practicable) depiction of non-major training exercises geographically across the AFAST Study Area. To the extent practicable, this report will also include the total number of sonar hours (from helicopter dipping sonar and object detection exercises) conducted within the southern NARW critical habitat plus 5 nm buffer area. The Navy shall include (in the AFAST annual report) a brief annual progress update on the status of the development of an effective and unclassified method to report this information until an agreed-upon (with NMFS) method has been developed and implemented.”*

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.

The total number of sonar hours (from helicopter dipping sonar or object detection exercises) that were conducted within the southern North Atlantic Right Whale (NARW) Critical Habitat plus a 5nm buffer area during this reporting period are presented in the classified version of this report.

(3) AFAST – IEER/AEER Summary

The annual summary of use within the AFAST Study Area for Improved Extended Echo-Ranging System (IEER) and Advanced Extended Echo-Ranging System (AEER) sonobuoys is classified. Data requested from the Navy is presented in the classified version of this report. Reporting elements include (i) Total number of IEER and AEER events; (ii) Total expended/detonated rounds (buoys); and (iii) Total number of self-scuttled IEER rounds.

Report Summary

The Navy's mitigation measures within the AFAST Study Area are assessed to have been effective during this reporting period. No animals were known to be adversely affected by the use of mid-frequency active sonar.

Visual detection by Navy lookouts remains the most realistically achievable at-sea mitigation currently available.

Real-time passive sonar systems used by the Navy, and to some degree by most of the marine mammal science community, lack the ability to automatically classify detected species in real time. Most current passive data sets rely on extensive post-collection analysis by skilled subject matter experts to conclusively establish species identification. In addition to species classification, range detection using moving passive acoustic systems on Navy ships is limited in real time. Also, non-vocalizing marine mammals cannot currently be detected using passive systems.

The Navy continues conducting robust and realistic exercises, and development of long-term marine mammal monitoring plans. The goal of these plans is to integrate multiple tools in an effort to generate better assessments of marine mammal occurrence and possible MFAS effects (or lack thereof). Data collection efforts continue to focus on addressing unresolved questions regarding likely area-specific species' composition and the potential for alternative detection technologies.

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