

Annual Range Complex Exercise Report

January to August 2009

- FINAL REPORT -
4 January 2010

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

04 January 2010

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(U) INTRODUCTION

(U) The U.S. Navy prepared this Annual Range Complex Exercise Report covering the period from January 2009 to 01 August 2009 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).

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

- (1) Mid-Frequency (MFAS)/High-Frequency (HFAS) Major Training Exercise (MTERs)
- (2) Anti-submarine Warfare (ASW) Summary
- (3) Improved Extended Echo Ranging (IEER) / Advanced Extended Echo Ranging (AEER) Summary

(U) Navy training events are variable within any given year based on the availability of strike groups undergoing training certification, logistics and fiscal considerations as they impact scheduling, and real-world commitments to other regional locations (North Atlantic and Mediterranean deployments, counter-piracy operations, disaster relief, etc.). Therefore, the data on range complex specific annual use as presented in this report will also be variable on an annual basis as compared to the total authorization from the NMFS.

(U) The information contained in this report represents the best practical data collection as of 01 August 2009. Given that many of the reporting metrics had not been previously collected in the format specified by NMFS, the Navy’s Range Complex data gathering process continues to be refined to improve the accuracy of reporting.

(U) Finally, on review of accumulated reporting metrics, the Navy has determined that certain portions become sensitive and classified by their summary. Information designated classified in this report will be submitted to NMFS in a separate **classified version**.

(U) The Navy continues to face public scrutiny and legal challenges regarding the possible impact of military sonar on marine mammals. As a result of recent court settlements, the Navy is required to document its use of mid-frequency active (MFA) sonar. Starting in mid-2006, the Navy mandated that each unit that uses MFA sonar submit a daily report on sonar usage to a central repository (the Sonar Positional Reporting System; SPORTS).² The Navy uses this aggregated information in both periodic and ad hoc reports of its sonar use to NMFS.

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

² COMFLTFORCOM, Message 231614Z May 2006, Sonar Positional Reporting System (SPORTS) implementation, Unclassified

(U) SECTION I AFAST STUDY AREA

(U) (1) MFAS/HFAS Major Training Exercise Summary

(U) This section summarizes authorized sonar use and marine mammal observations from MTERs conducted within the AFAST Study Area from January 2009 to 01 August 2009. The AFAST MTERs include *Southeastern ASW Integrated Training Initiative* exercises (SEASWITI), *Integrated ASW Course* (IAC), *Composite Training Unit Exercises* (COMPTUEX) and *Joint Task Force Exercises* (JTFEX).

(U) From January 2009 to 01 August 2009, there were four MTERs within the AFAST Study Area.

MTE Type	Dates (2009)	# Of Days
COMPTUEX *	06 – 27 January	22
COMPTUEX **	03 – 27 February	25
SEASWITI	23 – 27 February	5
COMPTUEX ***	09 June – 01 July	23

* IAC conducted in conjunction with COMPTUEX 11 & 13 January;

** 17 & 19 February; *** 15 & 17 June

(U) Exercise specific details as described in the AFAST Final Rule (DoN 2009) §216.245(f) (1) i to iii and LOA include:

- (i) Exercise Information (for each MTER)
- (ii) Individual marine mammal sighting information (for each sighting in each MTER)
- (iii) Evaluation (based on data gathered during all MTERs) of effectiveness of mitigation measures designed to avoid exposing marine mammals to MFAS. This evaluation shall identify the specific observations that support any conclusions the Navy reaches about the effectiveness of the mitigation.

(U) (i) Exercise Information and (ii) Individual marine mammal sighting information for each MTER

(U) AFAST MTER COMPTUEX January 2009

(A) Exercise designator	COMPTUEX 09-01 and IAC
(B) Date that exercise began and ended	06 January- 27 January 2009 (IAC 11 & 13 January)
(C) Location	AFAST
(D) Number and types of active sources used	(* SQS-53, (* SQS-56, (* BQQ-10, (* DICASS sonobuoys
(E) Number and types of passive sources used	(* SQS-53, (* SQS-56, (* SQR-19, (* BQQ-10, (* DIFAR passive sonobuoys
(F) Number and types of vessels and aircraft participating	ASW: (* CG, (* DDG, (* FFG, (* SSN, (* SH-60B non-dipping helicopter, (* SH-60F Non-ASW (not MFAS equipped): 1 additional surface ship
(G) Total hours of observation by watchstanders	16,820 hours
(H) Total hours of all active sonar sources operations	* hours
(I) Total hours of each active source	(* hrs) SQS-53, (* hrs) SQS-56, (* hrs) BQQ-10, (* hrs) DISCASS sonobuoy, (* dips) AQS-13F dipping sonar
(J) Wave height (high, low, and average during exercise)	HIGH: 12 ft, LOW: 2 ft, AVE: 5 ft

* CLASSIFIED

(U) AFAST MTER- Individual Marine Mammal Sighting Information COMPTUEX + IAC January 2009 (21 sightings of 110 marine mammals)

nr =not reported; VIS= visual; ACO= acoustic; y= yes; n= no; na= not applicable; crs= course

(A) Location	(B) Species	(C) # of individuals	(D) calves observed	(E) Detection Method	(F) Platform	(G) Minutes Observed	(H) Wave Height (ft)	(I) Visibility (nm)	(J) Sonar Source in Use (Y, N, N/A)	(K) Range (Yds or N/R)	(L) Mitigation Implementation and time, if reported (min)	(M) IF source in use hull-mounted, True Bearing, animal travel	(N) Observed MM behavior
JAX	TURTLE	1	N	VIS	CG	UNK	UNK	UNK	N	200-500 yd	None	N/A	Not Recorded
JAX	TURTLE	1	N	VIS	CG	UNK	UNK	UNK	N	200-500 yd	None	N/A	Not Recorded
JAX	DOLPHIN	1	N	VIS	FFG	UNK	UNK	UNK	N	200-500 yd	None	N/A	Not Recorded
JAX	DOLPHIN	4	N	VIS	CG	UNK	UNK	UNK	N	<200 yds	None	N/A	Not Recorded
JAX	DOLPHIN	40	N	VIS	DDG	UNK	UNK	UNK	N	<200 yds	None	N/A	Not Recorded
JAX	DOLPHIN	9	N	VIS	CG	UNK	UNK	UNK	N	<200 yds	None	N/A	Not Recorded
JAX	WHALE	2	N	VIS	DDG	UNK	UNK	UNK	N	>2000 yd	None	N/A	Not Recorded
JAX	WHALE	3	N	VIS	DDG	UNK	UNK	UNK	N	<200 yds	None	N/A	Not Recorded
JAX	DOLPHIN	1	N	ACO	DDG	UNK	UNK	UNK	N	N/R	None	N/A	Not Recorded
JAX	WHALE	3	N	VIS	CG	UNK	UNK	UNK	N	>2000 yd	None	N/A	Not Recorded
JAX	DOLPHIN	1	N	VIS	DDG	UNK	UNK	UNK	N	200-500 yd	None	N/A	Not Recorded
JAX	DOLPHIN	20	N	VIS	CG	UNK	UNK	UNK	N	<200 yds	None	N/A	Not Recorded
JAX	TURTLE	1	N	VIS	CG	UNK	UNK	UNK	N	<200 yds	None	N/A	Not Recorded
JAX	DOLPHIN	6	N	VIS	CG	UNK	UNK	UNK	N	<200 yds	None	N/A	Not Recorded
JAX	WHALE	1	N	VIS	DDG	UNK	UNK	UNK	N	>2000 yd	None	N/A	Not Recorded
JAX	DOLPHIN	1	N	VIS	DDG	UNK	UNK	UNK	N	500-1000yd	None	N/A	Not Recorded
JAX	WHALE	7	N	VIS	DDG	UNK	UNK	UNK	N	500-1000yd	None	N/A	Not Recorded
JAX	TURTLE	1	N	VIS	DDG	UNK	UNK	UNK	N	500-1000yd	None	N/A	Not Recorded
JAX	DOLPHIN	2	N	VIS	CG	10	UNK	UNK	Y	<200 yds	Shut Down, for 30 minutes	000 T, no recorded heading.	Not Recorded
JAX	DOLPHIN	2	N	VIS	CG	5	UNK	UNK	Y	<200 yds	Shut Down, for 30 minutes	000 T, no recorded heading.	Not Recorded
JAX	DOLPHIN	3	N	VIS	CG	UNK	UNK	UNK	N	<200 yds	None	N/A	Not Recorded

(U) AFAST MTER COMPTUEX February 2009

(A) Exercise designator	COMPTUEX 09-02 and IAC
(B) Date that exercise began and ended	03 – 27 February 2009 (IAC 17 & 19 February)
(C) Location	AFAST
(D) Number and types of active sources used	(* SQS-53, (* SQS-56, (* BQQ-10, (* DICASS sonobuoys
(E) Number and types of passive sources used	(* SQS-53, (* SQS-56, (* SQR-19, (* BQQ-10, (* DIFAR passive sonobuoys
(F) Number and types of vessels and aircraft participating	ASW: (* CG, (* DDG, (* FFG, (* SSN, (* SH-60B non-dipping helicopter, (* P-3C MPA Non-ASW (not MFAS equipped): 3 additional surface ships
(G) Total hours of observation by watchstanders	3,419 hours
(H) Total hours of all active sonar sources operations	* hours
(I) Total hours of each active source	(* hrs) SQS-53, (* hrs) SQS-56, (* hrs) BQQ-10, (* hrs) DISCASS sonobuoy
(J) Wave height (high, low, and average during exercise)	HIGH: 10 ft, LOW: 1 ft, AVE: 3 ft

* CLASSIFIED

(U) AFAST MTER- Individual Marine Mammal Sighting Information COMPTUEX + IAC Feb 2009 (39 sightings of 141 marine mammals)

nr =not reported; VIS= visual; ACO= acoustic; y= yes; n= no; na= not applicable; crs= course

(A) Location	(B) Species	(C) # of individuals	(D) calves observed	(E) Detection Method	(F) Platform	(G) Minutes Observed	(H) Wave Height (ft)	(I) Visibility (nm)	(J) Sonar Source in Use (Y, N, N/A)	(K) Range (Yds or N/R)	(L) Mitigation Implementation and time, if reported (min)	(M) IF source in use hull-mounted, True Bearing, animal travel	(N) Observed MM behavior
JAX	Dolphin	40	N	VIS	DDG	10	1	10	N	500-1000yd	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	DDG	10	2	10	N	N/R	None	N/A	Normal behavior
JAX	Whale	2	N	VIS	FFG	15	3	1	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	LSD	1	1	9	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	DDG	2	1	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	FFG	3	3	10	N	N/R	None	N/A	Not Recorded
JAX	Turtle	1	N	VIS	DDG	5	1	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	1	N	VIS	CG	5	1	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	DDG	5	2	10	N	<200 yds	None	N/A	Normal behavior
JAX	Dolphin	2	N	VIS	DDG	1	1	10	N	200-500 yd	None	N/A	2 dolphins off port beam
JAX	Dolphin	3	N	VIS	DDG	4	1	10	N	1000-2000	None	N/A	3 dolphins on stbd beam
JAX	Dolphin	1	N	VIS	DDG	5	2	10	N	<200 yds	None	N/A	Riding bow wake
JAX	Dolphin	34	N	VIS	DDG	1	1	10	N	<200 yds	None	N/A	Estimated 34 dolphins off stbd beam
JAX	Turtle	2	N	VIS	DDG	1	1	10	N	200-500 yd	None	N/A	2 sea turtles observed
JAX	Dolphin	1	N	VIS	DDG	5	1	10	N	<200 yds	None	N/A	Observed normal behavior
JAX	Turtle	1	N	VIS	DDG	1	1	10	N	<200 yds	None	N/A	Turtle showed normal behavior
JAX	Dolphin	2	N	VIS	FFG	3	2	10	N	N/R	None	N/A	Not Recorded
JAX	Whale	1	N	VIS	DDG	1	1	10	N	<200 yds	None	N/A	1 whale observed
JAX	Dolphin	1	N	VIS	DDG	1	1	10	N	<200 yds	None	N/A	Dolphin showed normal behavior
JAX	Dolphin	2	N	VIS	LSD	2	1	10	N	N/R	None	N/A	Not Recorded

(A) Location	(B) Species	(C) # of individuals	(D) calves observed	(E) Detection Method	(F) Platform	(G) Minutes Observed	(H) Wave Height (ft)	(I) Visibility (nm)	(J) Sonar Source in Use (Y, N, N/A)	(K) Range (Yds or N/R)	(L) Mitigation Implementation and time, if reported (min)	(M) IF source in use hull-mounted, True Bearing, animal travel	(N) Observed MM behavior
JAX	Dolphin	1	N	VIS	DDG	1	1	10	N	<200 yds	None	N/A	Dolphin showed normal behavior
JAX	Whale	2	N	VIS	DDG	60	1	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	DDG	1	1	10	N	<200 yds	None	N/A	Dolphin showed normal behavior
JAX	Whale	1	N	VIS	DDG	1	1	10	N	200-500 yd	None	N/A	1 whale observed
JAX	Dolphin	2	N	VIS	DDG	1	1	10	N	<200 yds	None	N/A	Dolphins showed normal behavior
JAX	Whale	2	N	VIS	CG	5	2	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	1	N	VIS	DDG	3	2	10	N	N/R	None	N/A	Not Recorded
JAX	Whale	2	N	VIS	DDG	5	1	10	N	500-1000yd	None	N/A	Whales showed normal behavior
JAX	Dolphin	2	N	VIS	DDG	1	2	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	LSD	15	1	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	DDG	10	4	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	DDG	10	4	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	LSD	15	1	10	N	N/R	None	N/A	Not Recorded
JAX	Whale	1	N	VIS	LSD	20	1	10	N	N/R	None	N/A	Not Recorded
JAX	Turtle	2	N	VIS	FFG	15	3	1	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	CG	5	10	10	N	N/R	None	N/A	Not Recorded
JAX	Whale	5	N	VIS	DDG	5	1	10	N	<200 yds	None	N/A	Not Recorded
JAX	Turtle	2	N	VIS	DDG	1	1	10	N	N/R	None	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	DDG	1	1	10	N	N/R	None	N/A	Not Recorded

(U) AFAST MTER SEASWITI February 2009

(A) Exercise designator	SEASWITI
(B) Date that exercise began and ended	23 - 27 February 2009
(C) Location	AFAST
(D) Number and types of active sources used	(* SQS-53, (* SQS-56, (* BQQ-10, (* AQS-13F, (* DICASS sonobuoys
(E) Number and types of passive sources used	(* SQS-53, (* SQS-56, (* SQR-19, (* BQQ-10, (* DIFAR passive sonobuoys
(F) Number and types of vessels and aircraft participating	ASW: (* CG, (* DDG, (* FFG, (* SSN, (* SH-60B non-dipping helicopter, (* SH-60F dipping helicopter, (* P-3C MPA Non-ASW (not MFAS equipped): 0 additional surface ship
(G) Total hours of observation by watchstanders	898 hours
(H) Total hours of all active sonar sources operations	* hours
(I) Total hours of each active source	(* hrs) SQS-53, (* hrs) SQS-56, (* hrs) BQQ-10, (* hrs) DISCASS sonobuoy
(J) Wave height (high, low, and average during exercise)	HIGH: 7 ft, LOW: 2 ft, AVE: 3 ft

* CLASSIFIED

(U) AFAST MTER- Individual Marine Mammal Sighting Information SEASWITI Feb 2009 (1 sighting of 1 marine mammal)

nr =not reported; VIS= visual; ACO= acoustic; y= yes; n= no; na= not applicable; crs= course

(A) Location	(B) Species	(C) # of individuals	(D) calves observed	(E) Detection Method	(F) Platform	(G) Minutes Observed	(H) Wave Height (ft)	(I) Visibility (nm)	(J) Sonar Source in Use (Y, N, N/A)	(K) Range (Yds or N/R)	(L) Mitigation Implementation and time, if reported (min)	(M) IF source in use hull-mounted, True Bearing, animal travel	(N) Observed MM behavior
JAX	WHALE	1	N	VIS	CG	2	3	10	Y	<200 yds	Shut Down, for 30 minutes	No recorded bearing, no recorded heading.	Not Recorded

(U) AFAST MTER COMPTUEX June 2009

(A) Exercise designator	COMPTUEX 09-03 and IAC
(B) Date that exercise began and ended	09 June – 01 July 2009 (IAC 15 & 17 June)
(C) Location	AFAST
(D) Number and types of active sources used	(* SQS-53, (* SQS-56, (* BQQ-10, (* AQS-13F, (* DICASS sonobuoys
(E) Number and types of passive sources used	(* SQS-53, (* SQS-56, (* SQR-19, (* BQQ-10, (* AQS-13F, (* DIFAR passive sonobuoys
(F) Number and types of vessels and aircraft participating	ASW: (* CG, (* DDG, (* FFG, (* SSN, (* SH-60B non-dipping helicopters, (* SH-60F dipping helicopter, (* P-3C MPA Non-ASW (not MFAS equipped): 1 additional surface ship
(G) Total hours of observation by watchstanders	17,956 hours
(H) Total hours of all active sonar sources operations	* hours
(I) Total hours of each active source	(* hrs) SQS-53, (* hrs) SQS-56, (* hrs) BQQ-10, (* hrs) AQS-13F, (* hrs) DISCASS sonobuoy
(J) Wave height (high, low, and average during exercise)	HIGH: 8 ft, LOW: 1 ft, AVE: 3 ft

* CLASSIFIED

(U) AFAST MTER- Individual Marine Mammal Sighting Information COMPTUEX + IAC June 2009 (28 sightings of 192 marine mammals)

nr = not reported; VIS= visual; ACO= acoustic; y= yes; n= no; na= not applicable

(A) Location	(B) Species	(C) # of individuals	(D) calves observed	(E) Detection Method	(F) Platform	(G) Minutes Observed	(H) Wave Height (ft)	(I) Visibility (nm)	(J) Sonar Source in Use (Y, N, N/A)	(K) Range (Yds or N/R)	(L) Mitigation Implementation and time, if reported (min)	(M) IF source in use hull-mounted, True Bearing, animal travel	(N) Observed MIM behavior
JAX	Dolphin	4	N	VIS	CG	25	3	10	N	200-500 yd	None	N/A	Surfaced
JAX	Dolphin	1	N	VIS	CG	25	3	10	N	200-500 yd	None	N/A	Surfaced
JAX	Dolphin	5	N	VIS	DDG	5	2	12	N	200-500 yd	None	N/A	was seen swimming near the ship
JAX	Whale	10	N	VIS	CG	3	1	15	N	200-500 yd	None	N/A	Surfaced
JAX	Whale	1	N	VIS	CG	UNK	UNK	UNK	UNK	>2000 yd	Not Recorded	N/A	Not Recorded
JAX	Dolphin	1	N	VIS	CG	1	3	15	N	<200 yds	None	N/A	Surfaced
JAX	Whale	2	N	VIS	CG	5	2	9	N	1000-2000	None	N/A	mammal was sighted while not active
JAX	Dolphin	1	N	ACO	CG	5	2	UNK	Y	N/R	Power Down for 5 min.	No recorded bearing, no recorded heading.	biologics were heard over WQC-2 and SQR-19B audio, number of mammals unknown
JAX	Whale	4	N	VIS	CG	1	3	15	Y	>2000 yd	Shut Down, Duration not recorded	030 T, opening.	Swimming
JAX	Dolphin	5	N	VIS	CG	2	3	10	N	<200 yds	None	N/A	Swimming
JAX	Dolphin	40	N	VIS	CG	4	3	10	Y	1000-2000	None	070 T, opening.	Swimming
JAX	Dolphin	10	N	VIS	DDG	UNK	UNK	UNK	N	500-1000yd	None	N/A	Not Recorded
JAX	Dolphin	15	N	VIS	CG	1	1	10	Y	500-1000yd	None	065 T, opening.	Swimming
JAX	Whale	4	N	VIS	CG	4	5	10	Y	>2000 yd	Shut Down, Duration not recorded	330 T, opening.	Swimming
JAX	Dolphin	3	N	ACO	CG	15	2	UNK	Y	N/R	Shut Down for 15 min.	030 T, opening.	mammals were heard over WQC-2 and seen by lookouts blowing near ship

(A) Location	(B) Species	(C) # of individuals	(D) calves observed	(E) Detection Method	(F) Platform	(G) Minutes Observed	(H) Wave Height (ft)	(I) Visibility (nm)	(J) Sonar Source in Use (Y, N, N/A)	(K) Range (Yds or N/R)	(L) Mitigation Implementation and time, if reported (min)	(M) IF source in use hull-mounted, True Bearing, animal travel	(N) Observed MM behavior
JAX	Dolphin	1	N	ACO	CG	2	UNK	UNK	Y	N/R	Shut Down for 2 min.	270 T, no recorded heading.	Not Recorded
JAX	Dolphin	1	N	ACO	CG	17	2	UNK	Y	N/R	Shut Down for 17 min.	000 T, no recorded heading.	Not Recorded
JAX	Dolphin	2	N	VIS	DDG	UNK	UNK	UNK	N	500-1000yd	Maneuvered vessel.	N/A	dolphins spotted off port bow, course changed
JAX	Dolphin	25	Y	VIS	DDG	UNK	3	8	N	200-500 yd	None	N/A	Swimming
JAX	Dolphin	7	N	VIS	CG	UNK	3	8	Y	<200 yds	Shut Down for 10 Minutes and maneuvered vessel.	155 T, opening.	Swimming
JAX	Generic	2	UNK	UNK	CG	UNK	UNK	UNK	UNK	N/R	Not Recorded	N/A	Not Recorded
JAX	Dolphin	2	N	VIS	DDG	2	3	10	N	<200 yds	None	N/A	Swimming
JAX	Dolphin	20	Y	VIS	CG	1	1	10	N	<200 yds	None	N/A	Swimming
JAX	Dolphin	6	N	VIS	DDG	5	UNK	UNK	N	200-500 yd	Not Recorded	N/A	was seen swimming next to the ship
JAX	Dolphin	4	N	VIS	CG	5	1	10	N	<200 yds	None	N/A	Swimming
JAX	Dolphin	5	N	ACO	CG	UNK	UNK	UNK	N	N/R	None	N/A	were heard over WQC-2
JAX	Dolphin	4	UNK	ACO	CG	UNK	UNK	UNK	N	N/R	None	N/A	were heard over WQC-2
JAX	Dolphin	7	UNK	ACO	CG	UNK	UNK	UNK	N	N/R	None	N/A	were heard over WQC-2

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

(U) Range Complex Evaluation

(U) From January 2009 to 01 August 2009, there were a total of 444 marine mammals from 89 sightings during four MTERs in the AFAST Study Area (**Table iii-1**). All of the sightings were in the JAX Operating Area as all four of the MTERs were conducted within this area. 34.8% of the reported sightings (31 of 89) did not provide a range estimate of the observation. 8 of these 31 sightings were actually detections by passive sonar and precluded an estimate of range. 4 of these 8 passive acoustic detections occurred simultaneously with MFAS operations and were conservatively reported as if they were within 200 yards of the ship using MFAS without verification of actual range. Of the remaining sightings (23 of 31) that did not report a range estimate MFAS was not in use, (no additional mitigation measures were required) possibly accounting for the lack of a range estimate being provided. A total of 75 days out of the approximately 181 days between January and 01 August contained an MTER (approximately 41.4 %).

(U) **Table iii-1. AFAST MTERs and associated marine mammal sightings.**

MTER Type	Month (2009)	# Of Exercise Days	# Of Ships Involved (MFAS and non-MFAS)	# Of Marine Mammal Sightings	# Of Marine Mammals
COMPTUEX *	Jan	22	17	21	110
COMPTUEX *	Feb	25	10	39	141
SEASWITI	Feb	5	3	1	1
COMPTUEX *	Jun	23	14	28	192
* Includes IAC					
<i>AFAST totals:</i>		75	44	89	444

(U) Mitigation Effectiveness Discussion

(U) The three categories of mitigation measures (Personnel Training, Lookout and Watchstander Responsibilities, and Operating Procedures) outlined in the AFAST EIS/OEIS and approved by NMFS (DoN 2008, NMFS 2009) were effective in detecting and appropriately mitigating exposures of marine mammals 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 and mandatory marine species awareness training. As more sighting and mitigation data is gathered as a result of this type of reporting, training will be adjusted and improved upon based on the lessons learned. The safety zones were adhered to, and vessels and aircraft apply mitigation measures when marine mammals are first visually observed within the requisite zone.

(U) There were a total of 9 sightings of 33 marine mammals for all AFAST MTER sightings at ranges less than 1,000 yards during which MFAS was in use. As a result, power down or shutdown mitigation measures were properly implemented. (**Table iii-2**).

(U) Of these 9 total MTER MFAS sightings, there were 8 sightings of 32 dolphins, 1 sighting of 1 whale, and 0 sightings of pinnipeds.

(U) **Table iii-2. Breakdown by ranges of less than 1000 yards of marine mammal sightings in the AFAST Study Area during sightings concurrent with MFAS use.**

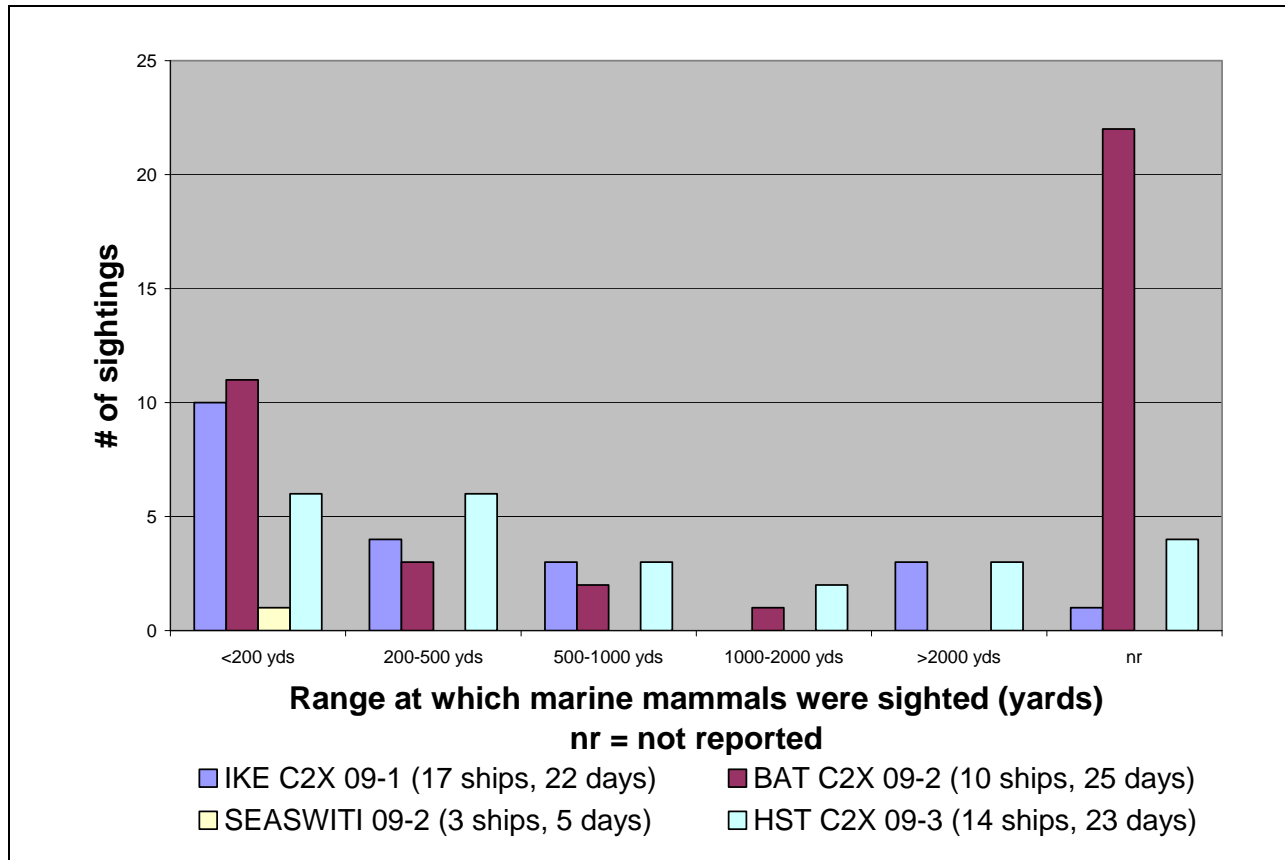
Range of marine mammal sighting		
< 200 yards	200-500 yards	500-1000 yards
17 dolphins *	0 dolphins	15 dolphins
1 whale	0 whales	0 whales
<u>0 pinnipeds</u>	<u>0 pinnipeds</u>	<u>0 pinnipeds</u>
18 total marine mammals	0 total marine mammals	15 total marine mammals
* Note: Includes four sightings where range to marine mammals were not reported		

(U) For AFAST MTERs, there were a total of 11 mitigation events reported. Of these, 1 mitigation event caused sonar power to be lowered (power down by either -6 or -10 dB) and 9 mitigation events caused sonar to be turned off (secured), with 3 of these power off events not requiring mitigation (range in excess of 1000 yds.) but still being applied (sonar shut down).

(U) **Table iii-3** contains a list of all mitigation events for AFAST. It should be noted that with or without mitigation, given relative motion of ships maneuvering at-sea and 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 iii-3 Column 13**.

(U) **Figure iii-1** shows the ranges from an individual ship of all marine mammal sightings (with and without MFAS) from each of four 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.

(U) 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 cover about 10 nm from its original location, well beyond ranges predicted to have significant exposures (**Table iii-3**).



(U) Figure iii-1. Marine mammal sighting by range and MTER in the AFAST Study Area.

(U) 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 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, 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.

(U) 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 iii-1, iii-2, iii-3** and **Figure iii-1**), there was no obvious indication or report that any animal behaved in a manner not associated with normal movement, or foraging (**Table iii-3**).

(U) Table iii-3. AFAST MTERs where sonar was on during detection of marine mammals at ranges less than 1000 yards and associated mitigation conducted.

1) OpArea [JAX (J); CHAS (C)]	2) MTER	3) Month (2009)	4) Species Sighted	5) # of marine mammals sighted	6) Platform	7) Length of time observed (min)	8) Range at which marine mammal sighted (yds)	9) Mitigation [secure (SD); power down (PD); maneuver ship (MAN) ¹⁾	10) Estimate MAX. exposure PRIOR to mitigation (dB re 1uPa) ²⁾	11) Number of minutes sonar mitigation applied (min)	12) Estimate exposure AFTER mitigation (dB re 1uPa) ²⁾	13) DISTANCE ship would have moved given length of mitigation and nominal 10-knot ship speed (yds)	14) IF source in use hull-mounted, true bearing, animal travel	15) Observed behavior
J	C2X	Jan	Dolphin	2	CG	10	<200	SD	< 190 dB	30	none for 30 min	10140	Dolphins 010 from ship, ship crs 265, dolphins moving toward ship (closing)	UNK
J	C2X	Jan	Dolphin	2	CG	5	<200	SD	< 190 dB	30	none for 30 min	10140	Dolphins 000 from ship, ship crs UNK, dolphin direction unknown	UNK
J	SEAWITI	Feb	Whale	1	CG	2	200	SD	< 190 dB	30	none for 30 min	10140	Whale 330 from ship, ship crs 000, whale direction unknown	UNK
J	C2X	Jun	Dolphin	1	CG	5	nr	PD	UKN	5	none for 5 min	1690	Detection was passive acoustic only	UNK
J	C2X	Jun	Whale	4	CG	1	>2000	SD	< 150 dB	nr	UNK	UNK	whale 030 from ship, ship crs 175, whale moving away from ship (opening)	Swimming
J	C2X	Jun	Dolphin	15	CG	1	1000	na	<182-176 dB	na	na	na	Dolphin 075 from ship, ship crs 065, dolphin moving away from ship (opening)	Swimming
J	C2X	Jun	Whale	4	CG	4	> 2000	SD	< 150 dB	nr	UNK	UNK	whale 060 from ship, ship crs 065, whale moving away from ship (opening)	Swimming
J	C2X	Jun	Dolphin	3	CG	15	nr	SD	UNK	15	none for 15 min	5070	Detection was passive acoustic and visual by lookouts	Blowing
J	C2X	Jun	Dolphin	1	CG	2	nr	SD	UNK	2	none for 2 min	676	Detection was passive acoustic only	UNK
J	C2X	Jun	Dolphin	1	CG	17	nr	SD	UNK	17	none for 17 min	5746	Detection was passive acoustic only	UNK
J	C2X	Jun	Dolphin	7	CG	nr	< 200	SD, MAN	< 190 dB	10	none for 10 min	3380	Dolphin 155 from ship, ship crs 180, dolphin moving away from ship (opening)	Swimming

1) OpArea [JAX (J); CHAS (C)]	2) MTER	3) Month (2009)	4) Species Sighted	5) # of marine mammals sighted	6) Platform	7) Length of time observed (min)	8) Range at which marine mammal sighted (yds)	9) Mitigation [secure (SD); power down (PD); maneuver ship (MAN) ¹]	10) Estimate MAX. exposure PRIOR to mitigation (dB re 1uPa) ²	11) Number of minutes sonar mitigation applied (min)	12) Estimate exposure AFTER mitigation (dB re 1uPa) ²	13) DISTANCE ship would have moved given length of mitigation and nominal 10-knot ship speed (yds)	14) IF source in use hull-mounted, true bearing, animal travel	15) Observed behavior
notes: ¹ na= not applicable; mitigation not required for ranges in excess of 1000 yds. ² 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 CG's (Urick 1982). Actual operating parameters and oceanographic conditions likely result in lower exposures. 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.														

² Exposure assessments

(U) Estimated exposures can be determined based on standard generic formulas of how sound propagates in water [defined as spherical spreading where propagation loss from a source = 20 log [R] with “R” being range from the source (Urick 1982)]. However, spherical spreading is only an appropriate sound propagation formula to a range of 1,000 yards from a source in open ocean, after which sound propagation is determined by cylindrical spreading [defined as spherical spreading where propagation loss from a source = 10 log [R] +30 with “R” being range from the source >1,000 yards and 30 being the spherical loss from 0 to 1,000 yards]. Depending on the range of the sighting reported in Table iii-3, Urick’s spherical formula was used to make very conservative assumptions about potential exposure. The formula above is a generic estimation of propagation and does not take into account other factors that could limit actual propagation such as oceanographic conditions and Navy-unique MFAS operating parameters which would result in slightly lower propagation ranges. Use of this approach to estimate potential Receive Levels (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 relative motion of ships and animals at sea, the time spent with any given exposure from surface ships is likely to be limited.

(U) SUMMARY

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

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

(U) 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. For instance, in minke whales, it is often only the male of the species that frequently vocalizes.

(U) The Navy continues conducting robust and realistic exercises, and development of long-term range complex 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 needs to address unresolved questions regarding likely area-specific species' composition and the potential for alternative detection technologies. This may be incorporated into future exercises as the Navy's exercise and marine mammal monitoring programs evolve.

(U) (2) ASW Summary

(U) This section summarizes information from MTERs and non-major training exercises such as unit-level training.

(U) (i) Total annual hours of each type of sonar source

(U) Total annual hours of each type of sonar source used within the AFAST Study Area from 01 January to 01 August 2009 are presented in the **classified version** of this report.

(U) Authorized MFAS, HFAS, or Explosive Sonobuoy sources §216.240 (c)	(U) Amt. Annually Authorized ¹
(1) AN/SQS-53 surface ship hull-mounted active sonar	3214 hrs
(2) AN/SQS-56 surface ship hull-mounted active sonar	1684 hrs
(3) AN/SQS-56 or 53 surface ship hull-mounted active sonar in object detection mode	216 hrs
(4) AN/BQQ-10 or 5 submarine active sonar	9976 pings
(5) AN/AQS-22 or 13 Helicopter Dipping Sonar	2952 dips
(6) AN/SSQ-62 DICASS sonobuoys	5853 buoys
(7) Mk-48 heavyweight torpedoes	32 torpedoes
(8) MK-46 or 54 lightweight torpedoes	24 hrs
(9) AN/SSQ-110A (IEER) and AN/SSQ-125 (AEER) explosive sonobuoys	872 buoys
(10) AN/SQQ-32 over the side mine-hunting sonar	4474 hrs
(11) AN/SLQ-25 NIXIE towed countermeasure	332 hrs
(12) AN/BQS-15 Submarine navigation	450 hrs
(13) Mk-1 or 2 or 3 or 4 Submarine-fired Acoustic Device Countermeasure (ADC)	225 ADCs
(14) Noise Acoustic Emitters NAE – Sub-fired countermeasure	127 NAEs

¹ as specified in NMFS 2009 (AFAST Final Rule)

(U) (ii) Cumulative Impact Report

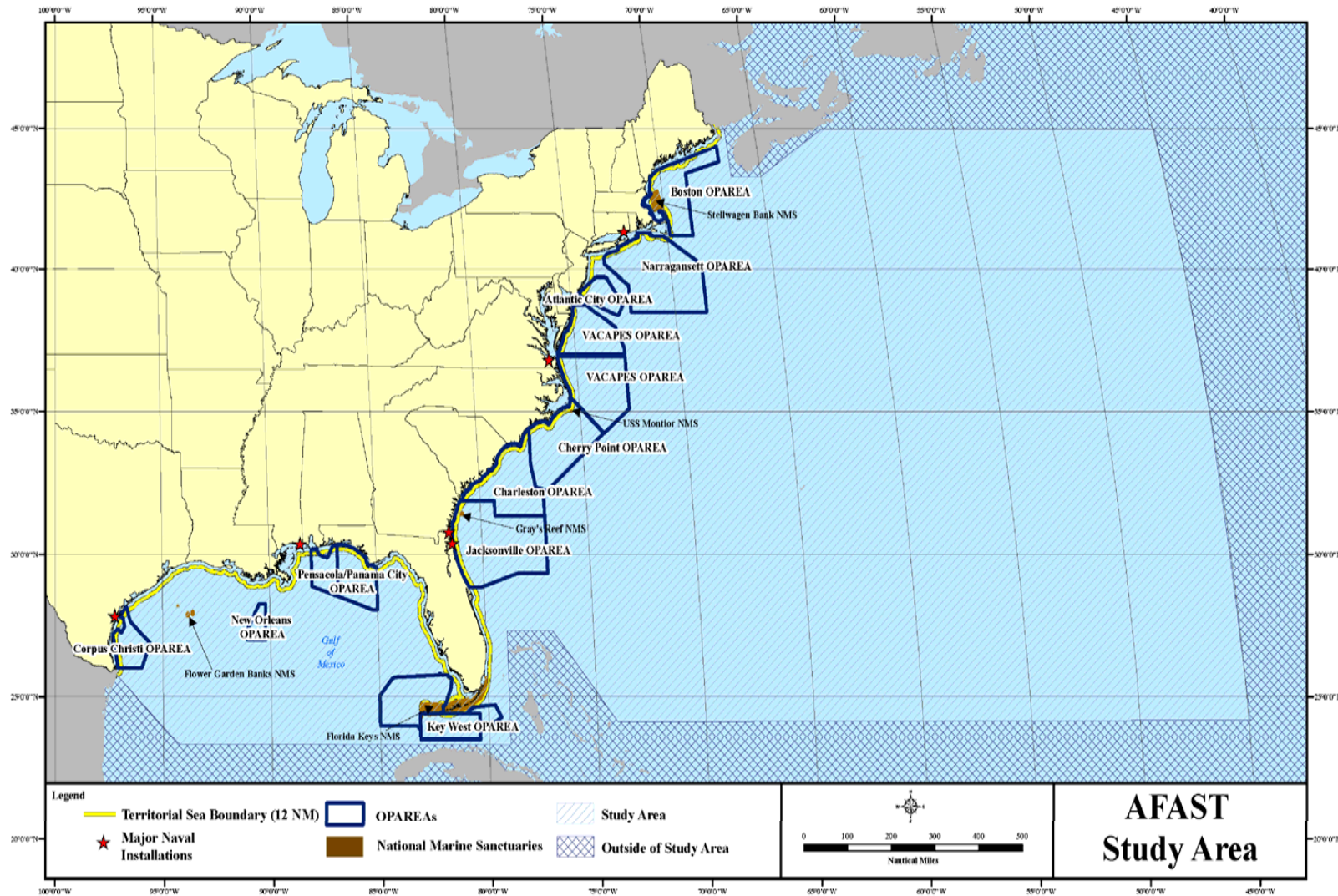
(U) FROM NMFS Final Rule: *“To the extent practical, the Navy shall develop and implement a method of annually reporting non-major training exercises utilizing hull-mounted sonar. This section shall report an annual (and seasonal, where practicable), depiction of non-major training exercises geographically 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 5nm buffer area.”*

(U) The annual quantity in hours and breakdown by system of hull-mounted sonar use in the AFAST Study Area during non-major training events is presented in the **classified version**. The majority of this MFAS occurred during short-duration unit level training (ULT). ULT is typically a single ship event that normally only lasts for a few hours at a time.

(U) The total number of sonar hours (from helicopter dipping sonar or object detection exercises) that were conducted within the southern NARW critical habitat plus 5nm buffer area during this reporting period is presented in the **classified version**.

(U) (3) AFAST- IEER/AEER Summary

(U) 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 deemed classified. Data requested from the Navy is contained 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.



(U) Figure A-1. Geographic extent of the AFAST Study Area

(U) REFERENCES

(U) DoN. 2008. Letter of Authorization Application (request for incidental Harassment for AFAST activities) submitted to NMFS Office of Protected Resources.

(U) DoN. 2008a. Final Atlantic Fleet Active Sonar Training Environmental Impact Statement\Overseas Environmental Impact Statement-December 2008. Department of the Navy.

(U) NMFS. 2008. Taking and Importing Marine Mammals; U.S. Navy's Atlantic Fleet Active Sonar Training (AFAST); Proposed Rule. October 14 2008. 73 FR 60754

(U) NMFS. 2009. Taking and Importing Marine Mammals; U.S. Navy's Atlantic Fleet Active Sonar Training (AFAST); Final Rule. January 27, 2009. 74 FR 4843.

(U) NMFS. 2009a. Letter of Authorization take marine mammals incidental to U.S. Navy's Atlantic Fleet Active Sonar Training (AFAST) issued. January 22 2009

(U) Urick, R.J. 1982. Sound Propagation in the Sea. Peninsula Publishing, Los Altos CA.

(U) COMFLTFORCOM, Message 231614Z may 2006, Sonar Positional Reporting System (SPORTS) implementation, Unclassified