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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 March 2014

Annual Unclassified Range Complex Exercise Report

2 August 2012 to 25 December 2013

For The U.S. Navy's
Southern California (SOCAL) Range Complex
and
Hawaii Range Complex (HRC)

1 March 2014

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INTRODUCTION

The U.S. Navy prepared this Annual Range Complex Exercise Report covering the period from 2 August 2012 to 25 December 2013 in compliance with the National Marine Fisheries Service (NMFS) Final Rule under the Marine Mammal Protection Act (MMPA) for the Southern California (SOCAL) Range Complex.

In the SOCAL Range Complex Letter of Authorization "Requirements for monitoring and reporting", the following report subsections were specified and are present within this report for the SOCAL Range Complex:

(1) Mid-Frequency Active Sonar (MFAS)/High-Frequency Active Sonar (HFAS) Major Training Exercises (MTE).

- (i) Exercise information (for each MTE).
- (ii) Individual marine mammal sighting information (for each MTE).
- (iii) Evaluation (based on data gathered during all MTEs) of effectiveness of mitigation measures designed to avoid exposing marine mammals 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) Sinking Exercises (SINKEX)

- (i) Exercise information (for each SINKEX)
- (ii) Individual marine mammal observation information (for each mammal sighting)

(4) Improved Extended Echo Ranging (IEER) Summary

- (i) Total number of IEER events conducted in the SOCAL Range Complex
- (ii) Total expended/detonated rounds (buoys)
- (iii) Total number of self-scuttled IEER rounds

(5) Explosives Summary

- (i) Total annual number of each type of explosive exercises
- (ii) Total annual expended/detonated rounds for each explosive type

This Annual Report covers the period from 2 August 2012 to 25 December 2013, and the information represents the best practical data collection for this period. 25 December 2013 marks the final day of data collection and reporting under the SOCAL EIS/OEIS. To provide accounting for the entire five year period of the authorization, the Navy will also submit a Comprehensive National Report at the end of the five years to provide totals of authorized usage. All classified data is reported in a separate report to the National Marine Fisheries Service at the appropriate level of classification.

(1) SOCAL – MFAS/HFAS Major Training Exercises

This section summarizes authorized sonar use and marine mammal observations from the MTEs conducted within the SOCAL Range Complex between 2 August 2012 and 25 December 2013.

For SOCAL, MTEs include Ship Anti-Submarine Warfare Readiness and Evaluation Measuring (SHAREM), Sustainment Exercises (SUSTEX), Integrated Anti-Submarine Warfare Course Phase II (IAC II), Composite Training Unit Exercises (C2X), and Joint Task Forces Exercises (JTFEX).

There were a total of six MTEs within the SOCAL Range Complex between 2 August 2012 and 25 December 2013. Exercise specific details as described in the SOCAL Final Rule §216.275(f)(1)i-iii and LOA include:

> (i) Exercise Information (for each MTE)
>
> (ii) Individual Marine Mammal Sighting Information (for each MTE)
>
> (iii) Evaluation (based on data gathered during all MTEs) of the 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.

(i) Exercise information

Table S1-i-1. MTEs conducted in the SOCAL Range Complex.

(A) Exercise	(B) Date	(C) Location	(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 (hrs)	(H) Total hours of all active sonar	(I) Total hours each active source							(J) Wave height (high, low, and average) (ft)
			SQS-53	SQS-56	BQQ-10	BQS-15*	AQS-22 (or AQS-13F)**	SSQ-62 Sonobuoys	SLQ-25 Nixie	SQS-53	SQS-56	Towed Array	BQQ-10	BQS-15*	AQS-22 (or AQS-13F)**	SSQ-53 Sonobuoys	CG	DDG	FFG	H-60F/R dipping helo	SH-60B non-dipping helo	Submarines	MPRA	Non-ASW surface ships			SQS-53	SQS-56	BQQ-10	BQS-15*	AQS-22 (or AQS-13F)**	SSQ-62 Sonobuoys	SLQ-25 Nixie	
C2X	17 Oct – 5 Nov	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	10,410	366	#	#	#	#	#	#	#	8,1,2
IAC II	29 Oct – 5 Nov	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	3,866	543	#	#	#	#	#	#	#	8,1,2
JTFEX	6 Nov – 12 Nov	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	2,896	490	#	#	#	#	#	#	#	8,1,2
SUSTEX	2 Apr – 18 Apr	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	4,072	195	#	#	#	#	#	#	#	13,1,6
C2X	8 Jul – 19 Jul	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	2,724	221	#	#	#	#	#	#	#	6,0,2
IAC II	6 Nov – 15 Nov	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	8,230	437	#	#	#	#	#	#	#	5,1,3

C2X=Composite Training Exercise; IAC II=Integrated ASW Course (Phase II); JTFEX=Joint Task Force Exercise; SUSTEX=Sustainment Exercise
S=SOCAL Range Complex

* Submarine high-frequency navigational sonar (BQS-15) incorrectly designated BQQ-15 in Final Rule and LOA.
** AQS-22 used as surrogate for AQS-13F; AQS-22 source level is higher than AQS-13F.
# Classified data.

(ii) Individual marine mammal sighting information by exercise

Table S1-ii-1. SOCAL MTE – Individual Marine Mammal Sighting Information: C2X 17 Oct – 5 Nov 2012.

(A) Location	(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
SOCAL	dolphin	15	N	VIS	DDG	3	2	10	N	200-500	none	na	Floating on the surface
SOCAL	dolphin	50	N	VIS	DDG	15	2	10	N	1000-2000	none	na	Floating on surface
SOCAL	whale	1	N	VIS	DDG	2	2	10	N	1000-2000	none	na	Floating on surface
SOCAL	whale	1	N	VIS	DDG	10	3	10	N	>2000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	3	4	10	N	>2000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	5	2	10	N	500-1000	none	na	nr
SOCAL	dolphin	20	N	VIS	DDG	2	2	10	N	500-1000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	1	2	10	N	500-1000	none	na	Surfaced then dove, flukes out of the water
SOCAL	dolphin	20	N	VIS	DDG	5	5	10	N	500-1000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	2	2	10	N	1000-2000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	4	3	10	N	1000-2000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	2	1	10	N	>2000	none	na	Blowing
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	>2000	none	na	Blowing
SOCAL	whale	1	N	VIS	DDG	8	2	10	N	>2000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	9	2	10	N	>2000	none	na	nr

(A) Location	(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
SOCAL	whale	1	N	VIS	DDG	5	2	10	N	>2000	none	na	nr
SOCAL	dolphin	20	N	VIS	Non-ASW ship	5	2	6	na	200-500	none	na	Paralleling ship
SOCAL	dolphin	20	N	VIS	DDG	3	1	10	N	200-500	none	na	nr
SOCAL	dolphin	50	N	VIS	DDG	1	1	10	N	500-1000	none	na	Jumping
SOCAL	dolphin	20	N	VIS	Non-ASW ship	10	2	6	na	500-1000	none	na	Paralleling ship
SOCAL	whale	1	N	VIS	HELO	4	3	5	Y	<200	Shut down sonar	Whale bearing 000, helo course nr, nr	nr
SOCAL	dolphin	10	N	VIS	DDG	5	2	2	N	<200	none	na	Observed to be Bow Riding.
SOCAL	dolphin	10	N	VIS	DDG	5	2	10	Y	<200	none	Dolphins bearing 270, ship course 270, paralleling ship	Bow riding
SOCAL	dolphin	5	N	VIS	DDG	2	2	5	Y	500-1000	Powered down sonar	Dolphins bearing 213, ship course 213, nr	nr
SOCAL	dolphin	15	N	VIS	DDG	5	3	3	N	500-1000	none	na	Closing to bow ride
SOCAL	dolphin	3	N	VIS	DDG	10	4	10	N	500-1000	none	na	Crossed the bow
SOCAL	dolphin	3	N	VIS	DDG	15	2	10	N	1000-2000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	10	1	7	N	1000-2000	none	na	Saw 1 whale off the stbd bow at about 2000 YDS
SOCAL	dolphin	50	N	VIS	DDG	2	2	10	Y	>2000	none	Dolphins bearing 030, ship course 000, closing ship	Swimming
SOCAL	whale	2	N	VIS	CG	1	3	10	Y	<200	Powered down sonar	Whales bearing 265, ship course 090, opening ship	Crossing port to starboard
SOCAL	whale	1	N	VIS	DDG	1	3	10	N	200-500	none	na	nr

(A) Location	(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
SOCAL	whale	1	N	VIS	CG	1	2	10	Y	200-500	Powered down sonar	Whale bearing 040, ship course 123, paralleling ship	1 whale on stbd bow
SOCAL	dolphin	40	N	VIS	Non-ASW ship	5	2	10	na	200-500	none	na	Paralleling ship
SOCAL	whale	1	N	VIS	DDG	1	2	10	N	500-1000	none	na	Jumping astern of ship
SOCAL	whale	1	N	VIS	CG	2	5	10	Y	500-1000	Powered down sonar	Whale bearing 010, ship course 277, opening ship	On stbd bow traveling west
SOCAL	dolphin	34	N	VIS	DDG	5	1	10	N	500-1000	none	na	Bow riding
SOCAL	dolphin	10	N	VIS	DDG	5	1	10	N	1000-2000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	2	1	10	N	1000-2000	none	na	Diving
SOCAL	dolphin	30	N	VIS	CG	30	3	10	N	1000-2000	none	na	Traveling
SOCAL	whale	1	N	VIS	DDG	5	3	10	N	1000-2000	none	na	nr
SOCAL	whale	3	N	VIS	CG	10	4	10	N	>2000	none	na	Blowing
SOCAL	dolphin	3	N	VIS	DDG	5	nr	10	N	<200	none	na	Bow riding
SOCAL	whale	1	N	VIS	DDG	1	nr	10	N	500-1000	none	na	nr
SOCAL	whale	5	N	VIS	DDG	20	2	10	N	>2000	none	na	Breeching
SOCAL	whale	2	N	VIS	DDG	1	2	10	N	>2000	none	na	Surfacing
SOCAL	whale	1	N	VIS	DDG	1	2	10	N	>2000	none	na	Surfacing
SOCAL	generic	1	N	ACO	DDG	10	nr	nr	Y	nr	none	Animal bearing nr, ship course nr, nr	nr
SOCAL	generic	1	N	ACO	DDG	1	nr	nr	Y	nr	none	Animal bearing nr, ship course 211, nr	nr

(A) Location	(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
SOCAL	dolphin	3	N	VIS	DDG	3	1	10	N	<200	none	na	Bow riding
SOCAL	whale	1	N	VIS	DDG	10	6	10	N	200-500	Maneuvered away	na	Blowing
SOCAL	whale	1	N	VIS	DDG	10	6	10	N	500-1000	Maneuvered away	na	Blowing
SOCAL	dolphin	1	N	VIS	DDG	1	nr	10	N	<200	none	na	Diving
SOCAL	whale	2	N	VIS	DDG	6	3	10	N	200-500	none	na	Blowing, breached the surface
SOCAL	whale	1	N	VIS	DDG	5	2	10	N	500-1000	Maneuvered away	na	Blowing, breached the surface
SOCAL	whale	1	N	VIS	DDG	1	nr	10	N	500-1000	Maneuvered away	na	Blowing
SOCAL	whale	3	N	VIS	CG	3	5	10	Y	500-1000	Powered down sonar	Whales bearing 090, ship course 315, closing ship	Blowing
SOCAL	whale	1	N	VIS	DDG	10	nr	10	N	500-1000	none	na	Swimming
SOCAL	dolphin	5	N	VIS	DDG	1	2	10	N	1000-2000	none	na	Bow riding
SOCAL	dolphin	100	N	VIS	DDG	15	nr	10	N	1000-2000	none	na	Bow riding
SOCAL	whale	2	N	VIS	DDG	15	nr	10	N	>2000	none	na	Blowing
SOCAL	whale	1	N	VIS	Non-ASW ship	4	nr	10	na	>2000	none	na	Paralleling ship
SOCAL	whale	1	N	VIS	DDG	10	2	10	N	>2000	none	na	nr
SOCAL	generic	1	N	ACO	DDG	nr	nr	nr	N	nr	none	na	Unknown number of mammals heard on WQC-2
SOCAL	generic	1	N	ACO	DDG	10	nr	nr	Y	nr	none	Animal bearing nr, ship course nr, nr	Unknown number of mammals heard over WQC-2

(A) Location	(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
SOCAL	dolphin	6	N	VIS	DDG	10	1	10	N	200-500	none	na	nr
SOCAL	whale	2	N	VIS	DDG	1	3	NR	N	200-500	none	na	Blowing
SOCAL	pinniped	5	N	VIS	CG	5	2	10	N	200-500	none	na	5 Sea Lions surface swimming
SOCAL	whale	2	N	VIS	DDG	3	3	10	N	200-500	none	na	Blowing
SOCAL	dolphin	30	N	VIS	DDG	1	3	10	N	500-1000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	5	2	10	N	1000-2000	Maneuvered away	na	Blowing
SOCAL	whale	2	N	VIS	DDG	10	3	10	N	>2000	none	na	nr
SOCAL	dolphin	30	N	VIS	CG	30	2	10	N	>2000	none	na	Bow riding
SOCAL	whale	3	N	VIS	DDG	3	1	10	N	>2000	none	na	Paralleling
SOCAL	whale	2	N	VIS	DDG	10	1	10	N	>2000	none	na	nr
SOCAL	dolphin	20	N	VIS	Non-ASW ship	10	1	10	na	>2000	none	na	Paralleling ship
SOCAL	dolphin	1	N	VIS	DDG	3	1	10	N	<200	none	na	Bow riding
SOCAL	whale	1	N	VIS	DDG	2	1	10	N	500-1000	none	na	nr
SOCAL	whale	25	N	VIS	Non-ASW ship	5	1	5	na	500-1000	none	na	Paralleling ship
SOCAL	whale	2	N	VIS	DDG	5	2	10	N	500-1000	none	na	nr
SOCAL	whale	2	N	VIS	CG	2	2	10	N	500-1000	none	na	Surfacing
SOCAL	whale	1	N	VIS	DDG	2	1	10	N	1000-2000	none	na	nr
SOCAL	whale	15	N	VIS	DDG	15	3	10	N	1000-2000	none	na	Blowing

(A) Location	(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
SOCAL	whale	1	N	VIS	DDG	2	2	7	N	>2000	none	na	nr

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

Table S1-ii-2. SOCAL MTE – Individual Marine Mammal Sighting Information: IAC II 29 Oct – 5 Nov 2012.

(A) Location	(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
SOCAL	dolphin	50	N	VIS	DDG	10	0	10	Y	<200	none	Dolphins bearing 100, ship course 120, paralleling ship	Bow riding
SOCAL	dolphin	25	N	VIS	CG	10	2	8	N	<200	none	na	Surface swimming
SOCAL	pinniped	10	N	VIS	DDG	1	1	10	N	<200	none	na	Swimming
SOCAL	dolphin	20	N	VIS	CG	10	1	10	N	<200	none	na	Surface swimming
SOCAL	dolphin	3	N	VIS	DDG	2	1	10	N	<200	none	na	Crossed bow and proceeded north
SOCAL	dolphin	10	N	VIS	DDG	1	1	10	Y	<200	Shut down sonar	Dolphins bearing 110, ship course 102, closing ship	Bow riding
SOCAL	pinniped	10	N	VIS	DDG	8	1	10	N	200-500	none	na	Swimming
SOCAL	dolphin	10	N	VIS	DDG	5	1	10	Y	200-500	Shut down sonar	Dolphins bearing 180, ship course 060, closing ship	Swimming
SOCAL	pinniped	10	N	VIS	DDG	8	1	10	Y	200-500	Shut down sonar	Pinnipeds bearing 030, ship course 104, nr	nr
SOCAL	whale	1	N	VIS	CG	3	1	10	Y	500-1000	Powered down sonar	Whale bearing 180, ship course 090, paralleling ship	Blowing, whale approached briefly then dove
SOCAL	dolphin	50	N	VIS	DDG	5	0	10	Y	500-1000	none	Dolphins bearing 120, ship course 100, opening ship	Blowing
SOCAL	whale	1	N	VIS	DDG	5	2	10	Y	>2000	none	Whale bearing 100, ship course nr, opening ship	Blowing
SOCAL	whale	4	N	VIS	DDG	15	0	10	N	>2000	none	na	Blowing
SOCAL	whale	1	N	VIS	DDG	1	2	10	N	500-1000	none	na	Blowing

(A) Location	(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
SOCAL	whale	5	N	VIS	DDG	11	nr	10	Y	500-1000	Powered down sonar	Whales bearing 200, ship course nr, nr	Whales reported 1000 yards off port bow
SOCAL	dolphin	20	N	VIS	DDG	5	2	10	N	1000-2000	none	na	Paralleling ship
SOCAL	whale	1	N	VIS	DDG	2	2	8	N	1000-2000	none	na	Blowing
SOCAL	dolphin	20	N	VIS	DDG	10	2	10	N	1000-2000	none	na	Feeding
SOCAL	dolphin	6	N	VIS	DDG	1	1	10	N	>2000	none	na	Jumping
SOCAL	dolphin	5	N	VIS	DDG	45	2	8	N	>2000	none	na	Blowing
SOCAL	whale	3	N	VIS	CG	1	2	10	N	>2000	none	na	Surface swimming
SOCAL	whale	1	N	VIS	CG	2	2	10	N	>2000	none	na	Surface swimming
SOCAL	generic	1	N	ACO	DDG	2	1	10	Y	nr	none	Animal bearing nr, ship course 042, nr	nr
SOCAL	whale	2	N	VIS	HELO	5	2	10	Y	<200	Shut down sonar	Whales bearing 000, helo course nr, nr	nr
SOCAL	dolphin	15	N	VIS	DDG	1	1	10	N	<200	none	na	nr
SOCAL	dolphin	2	N	VIS	DDG	2	1	7	Y	<200	Maneuvered away	Dolphins bearing 230, ship course 140, opening ship	Bow riding
SOCAL	dolphin	15	N	VIS	DDG	5	3	10	N	200-500	none	na	nr
SOCAL	whale	2	N	VIS	DDG	5	2	10	N	500-1000	none	na	Swimming
SOCAL	whale	2	N	VIS	DDG	6	2	7	Y	1000-2000	Powered down sonar	Whales bearing 300, ship course 029, paralleling ship	Blowing
SOCAL	whale	1	N	VIS	DDG	1	2	10	Y	>2000	none	Whale bearing 300, ship course 000, nr	Swimming

(A) Location	(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
SOCAL	dolphin	50	N	VIS	DDG	30	2	10	N	>2000	none	na	Feeding
SOCAL	whale	1	N	VIS	DDG	1	2	10	Y	>2000	none	Whale bearing 090, ship course 000, nr	Swimming
SOCAL	whale	1	N	VIS	DDG	5	2	10	N	>2000	none	na	Blowing
SOCAL	whale	1	N	VIS	DDG	5	2	10	Y	>2000	none	Whale bearing 313, ship course 270, paralleling ship	nr
SOCAL	whale	1	N	VIS	DDG	2	2	10	N	1000-2000	none	na	Surfaced
SOCAL	dolphin	20	N	VIS	DDG	5	2	10	N	1000-2000	none	na	Swimming
SOCAL	dolphin	10	N	VIS	DDG	6	1	10	N	>2000	none	na	Swimming
SOCAL	whale	3	N	VIS	DDG	2	2	10	N	>2000	none	na	Blowing
SOCAL	whale	1	N	VIS	DDG	7	2	10	N	>2000	none	na	Surfaced
SOCAL	pinniped	1	N	VIS	DDG	2	1	10	N	>2000	none	na	Swimming
SOCAL	pinniped	1	N	VIS	DDG	1	1	10	N	>2000	none	na	Swimming
SOCAL	dolphin	5	Y	VIS	DDG	1	3	10	Y	<200	Shut down sonar	Dolphins bearing 325, ship course 020, opening ship	Jumping
SOCAL	whale	1	N	VIS	Non-ASW ship	5	2	10	na	500-1000	none	na	Paralleling ship
SOCAL	dolphin	10	N	VIS	DDG	2	2	8	N	500-1000	none	na	Surfaced
SOCAL	whale	2	N	VIS	DDG	5	2	10	N	500-1000	none	na	Blowing
SOCAL	dolphin	99	N	VIS	HELO	nr	3	10	N	<200	none	na	nr
SOCAL	dolphin	15	N	VIS	DDG	11	1	10	Y	<200	Shut down sonar	Dolphins bearing 015, ship course nr, paralleling ship	Bow riding

(A) Location	(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
SOCAL	pinniped	2	N	VIS	DDG	7	1	10	Y	<200	Shut down sonar	Pinnipeds bearing 270, ship course nr, opening ship	nr
SOCAL	dolphin	20	N	VIS	DDG	1	1	7	Y	200-500	none	Dolphins bearing 320, ship course 320, nr	Bow Riding Port bow
SOCAL	dolphin	50	Y	VIS	DDG	45	2	7	Y	200-500	Shut down sonar	Dolphins bearing 080, ship course 140, closing ship	Started off the bow, then to port beam
SOCAL	whale	2	N	VIS	DDG	10	nr	nr	Y	200-500	Shut down sonar	Whales bearing 330, ship course nr, closing ship	Shutdown when mammal reached 200 yards
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	200-500	none	na	nr
SOCAL	dolphin	1	N	VIS	DDG	5	2	10	N	200-500	none	na	nr
SOCAL	whale	1	N	VIS	DDG	45	4	10	N	200-500	none	na	Blowing
SOCAL	whale	2	N	VIS	DDG	8	4	10	Y	200-500	Powered down sonar	Whales bearing 330, ship course 330, paralleling ship	Blowing
SOCAL	whale	3	N	VIS	DDG	10	1	10	Y	200-500	Powered down sonar	Whales bearing 020, ship course nr, nr	nr
SOCAL	whale	1	N	VIS	DDG	nr	4	10	N	500-1000	none	na	Blowing
SOCAL	whale	2	N	VIS	CG	10	5	10	N	500-1000	none	na	Surfacing
SOCAL	dolphin	30	N	VIS	DDG	5	2	8	N	500-1000	none	na	Bow riding paralleling ship
SOCAL	whale	1	N	VIS	DDG	4	1	10	N	500-1000	none	na	nr
SOCAL	whale	1	N	VIS	DDG	10	2	10	N	500-1000	none	na	Blowing
SOCAL	whale	2	N	VIS	DDG	2	1	10	Y	500-1000	Powered down sonar	Whales bearing 040, ship course nr, nr	nr

(A) Location	(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
SOCAL	whale	3	N	VIS	DDG	7	1	10	Y	500-1000	Powered down sonar	Whales bearing 050, ship course 060, nr	nr
SOCAL	whale	1	N	VIS	DDG	20	3	10	Y	500-1000	Shut down sonar	Whale bearing 090, ship course nr, nr	nr
SOCAL	whale	1	N	VIS	DDG	5	1	10	N	500-1000	none	na	nr
SOCAL	whale	2	N	VIS	CG	5	3	10	Y	500-1000	Powered down sonar	Whales bearing 310, ship course 085, paralleling ship	Surfacing
SOCAL	whale	1	N	VIS	DDG	1	2	10	N	500-1000	none	na	nr
SOCAL	pinniped	3	N	VIS	DDG	3	1	10	N	1000-2000	none	na	nr
SOCAL	whale	2	N	VIS	DDG	30	1	10	N	1000-2000	none	na	Paralleling ship
SOCAL	dolphin	20	Y	VIS	DDG	5	2	10	N	1000-2000	none	na	nr
SOCAL	dolphin	20	Y	VIS	DDG	5	1	10	N	1000-2000	none	na	Feeding
SOCAL	whale	1	N	VIS	CG	10	5	10	Y	>2000	none	Whale bearing 180, ship course 000, closing ship	Breaching
SOCAL	dolphin	12	N	VIS	DDG	4	2	10	Y	>2000	none	Dolphins bearing 030, ship course nr, paralleling ship	Paralleling ship
SOCAL	generic	1	N	ACO	DDG	1	nr	nr	Y	nr	none	Animal bearing nr, ship course nr, nr	Heard over WQC-2, no visual sightings reported
SOCAL	generic	1	N	ACO	DDG	1	nr	nr	Y	nr	none	Animal bearing nr, ship course nr, nr	Heard over WQC-2, no visual sightings reported
SOCAL	generic	1	N	ACO	DDG	5	nr	nr	Y	nr	none	Animal bearing nr, ship course nr, nr	Heard over WQC-2, no visual sightings reported
SOCAL	dolphin	100	N	VIS	DDG	20	nr	nr	Y	nr	none	Dolphins bearing nr, ship course nr, nr	nr

(A) Location	(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
SOCAL	whale	2	N	VIS	DDG	nr	nr	nr	Y	nr	Powered down sonar	Whales bearing nr, ship course nr, nr	nr
SOCAL	whale	2	N	VIS	DDG	nr	nr	nr	Y	nr	Powered down sonar	Whales bearing nr, ship course nr, nr	nr
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	>2000	none	na	nr
SOCAL	dolphin	6	N	VIS	DDG	2	1	10	N	<200	none	na	nr
SOCAL	dolphin	40	N	VIS	DDG	4	2	10	N	200-500	none	na	Paralleling
SOCAL	dolphin	40	N	VIS	DDG	4	2	10	N	200-500	none	na	Paralleling
SOCAL	dolphin	15	N	VIS	DDG	2	2	10	N	200-500	none	na	Jumping
SOCAL	dolphin	20	N	VIS	DDG	8	1	10	N	500-1000	none	na	nr
SOCAL	pinniped	10	N	VIS	DDG	3	1	10	N	500-1000	none	na	Floating
SOCAL	dolphin	100	N	VIS	DDG	5	2	10	N	500-1000	none	na	nr
SOCAL	dolphin	40	Y	VIS	DDG	5	2	10	N	500-1000	none	na	nr

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

Table S1-ii-3. SOCAL MTE – Individual Marine Mammal Sighting Information: JTFEX 6 – 12 Nov 2012.

(A) Location	(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
SOCAL	dolphin	15	Y	VIS	DDG	12	1	10	N	<200	none	na	Closing
SOCAL	dolphin	6	N	VIS	DDG	5	1	10	N	<200	none	na	Closing
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	500-1000	none	na	Floating
SOCAL	whale	5	N	VIS	DDG	5	1	10	N	500-1000	none	na	Fins
SOCAL	dolphin	3	N	VIS	DDG	10	1	10	N	500-1000	none	na	nr
SOCAL	dolphin	100	N	VIS	Non-ASW ship	10	1	10	na	500-1000	none	na	Paralleling ship
SOCAL	dolphin	99	N	VIS	DDG	15	1	10	N	500-1000	none	na	nr
SOCAL	whale	10	N	VIS	Non-ASW ship	5	1	10	na	1000-2000	none	na	Paralleling ship
SOCAL	whale	10	N	VIS	CG	10	4	10	N	1000-2000	none	na	Breaching
SOCAL	generic	1	N	ACO	DDG	10	nr	nr	Y	nr	none	Animal bearing nr, ship course nr, nr	nr
SOCAL	dolphin	50	N	VIS	DDG	10	1	1	N	<200	none	na	nr
SOCAL	dolphin	30	N	VIS	DDG	1	3	10	N	500-1000	none	na	Jumping
SOCAL	whale	3	N	VIS	Non-ASW ship	10	3	10	na	500-1000	none	na	Paralleling ship
SOCAL	whale	4	N	VIS	DDG	15	1	10	Y	1000-2000	Shut down sonar	Whales bearing 345, ship course nr, nr	Whales off stbd side
SOCAL	dolphin	13	N	VIS	Non-ASW ship	3	3	10	na	>2000	none	na	Paralleling ship
SOCAL	generic	1	N	ACO	DDG	nr	nr	nr	N	nr	none	na	nr
SOCAL	whale	1	N	VIS	Non-ASW ship	1	2	10	na	<200	none	na	Diving
SOCAL	dolphin	20	N	VIS	DDG	10	2	10	N	1000-2000	none	na	Parallel C/S

(A) Location	(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
SOCAL	dolphin	4	N	VIS	DDG	5	1	10	N	1000-2000	none	na	Parallel C/S
SOCAL	whale	3	N	VIS	CG	2	6	10	Y	1000-2000	none	Whales bearing 271, ship course nr, nr	nr
SOCAL	whale	3	N	VIS	DDG	5	2	10	N	1000-2000	none	na	Parallel C/S
SOCAL	whale	3	N	VIS	CG	2	6	10	Y	1000-2000	none	Whales bearing 271, ship course 050, paralleling ship	Surfaced
SOCAL	generic	1	N	ACO	DDG	nr	nr	nr	N	nr	none	na	nr
SOCAL	whale	2	N	VIS	DDG	1	2	10	N	500-1000	none	na	Floating
SOCAL	whale	1	N	VIS	DDG	30	4	10	N	>2000	none	na	Blowing
SOCAL	dolphin	30	N	VIS	Non-ASW ship	5	4	10	na	200-500	none	na	Crossing bow
SOCAL	whale	2	N	VIS	HELO	nr	4	10	N	<200	none	na	nr
SOCAL	whale	1	N	VIS	DDG	35	2	12	Y	<200	Shut down sonar	Whale bearing 270, ship course 350, paralleling ship	Parallel course of ship
SOCAL	whale	1	N	VIS	CG	10	4	10	N	1000-2000	none	na	nr

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

Table S1-ii-4. SOCAL MTE – Individual Marine Mammal Sighting Information: SUSTEX 2 – 18 Apr 2013.

(A) Location	(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
SOCAL	dolphin	5	N	VIS	Non-ASW ship	5	8	10	na	<200	none	na	Closing to bow ride
SOCAL	dolphin	10	N	VIS	Non-ASW ship	5	8	10	na	200-500	none	na	Paralleling ship
SOCAL	dolphin	21	N	VIS	Non-ASW ship	30	3	10	na	>2000	none	na	Paralleling ship
SOCAL	dolphin	5	N	VIS	Non-ASW ship	5	8	10	na	<200	none	na	Closing to bow ride
SOCAL	dolphin	10	N	VIS	Non-ASW ship	5	8	10	na	200-500	none	na	Paralleling ship
SOCAL	dolphin	15	N	VIS	Non-ASW ship	3	3	10	na	500-1000	none	na	Surfacing
SOCAL	dolphin	5	N	VIS	DDG	2	3	10	N	<200	none	na	Paralleling C/S
SOCAL	dolphin	11	N	VIS	DDG	2	3	10	N	<200	none	na	Paralleling C/S
SOCAL	dolphin	2	N	VIS	DDG	1	4	10	N	<200	none	na	Swimming
SOCAL	dolphin	2	N	VIS	Non-ASW ship	3	5	10	na	nr	none	na	Surfacing
SOCAL	pinnped	2	N	VIS	DDG	2	2	8	N	200-500	none	na	Feeding
SOCAL	whale	1	N	VIS	DDG	5	4	4	N	<200	Shut down sonar	na	Swimming
SOCAL	turtle	1	N	VIS	DDG	1	4	7	N	<200	none	na	Blowing
SOCAL	whale	3	N	VIS	DDG	3	4	4	Y	<200	Shut down sonar	Whales bearing 270, ship course 015, opening ship	Swimming
SOCAL	dolphin	24	N	VIS	DDG	5	4	10	N	<200	none	na	Swimming/ jumping
SOCAL	dolphin	30	N	VIS	Non-ASW ship	4	2	10	na	<200	none	na	Surfacing
SOCAL	whale	1	N	VIS	HELO	3	4	4	Y	<200	Shut down sonar	Whale bearing nr, helo course nr, nr	Surfacing

(A) Location	(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
SOCAL	dolphin	13	N	VIS	DDG	4	6	9	N	200-500	none	na	Paralleling C/S
SOCAL	dolphin	6	N	VIS	DDG	6	4	7	N	200-500	none	na	Bowriding
SOCAL	whale	1	N	VIS	DDG	4	4	4	N	200-500	none	na	Swimming
SOCAL	whale	1	N	VIS	DDG	1	4	7	N	200-500	none	na	Blowing
SOCAL	whale	1	N	VIS	DDG	5	4	4	Y	500-1000	Powered down sonar	Whale bearing 050, ship course 030, opening ship	Swimming
SOCAL	whale	1	N	VIS	Non-ASW ship	4	2	10	na	nr	none	na	Surfacing
SOCAL	dolphin	12	N	VIS	DDG	10	2	10	N	200-500	none	na	Closing to bow ride
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	200-500	none	na	Feeding
SOCAL	dolphin	10	N	VIS	Non-ASW ship	4	4	10	na	500-1000	none	na	Surfacing
SOCAL	whale	5	N	VIS	Non-ASW ship	5	4	8	na	nr	none	na	nr
SOCAL	dolphin	20	N	VIS	Non-ASW ship	10	2	7	na	200-500	none	na	Paralleling ship
SOCAL	whale	1	N	VIS	Non-ASW ship	5	2	7	na	200-500	none	na	Surfacing
SOCAL	dolphin	50	N	VIS	Non-ASW ship	1	6	10	na	500-1000	none	na	Surfacing
SOCAL	dolphin	3	N	VIS	DDG	4	2	10	Y	500-1000	none	Dolphins bearing 090, ship course 044, paralleling ship	Paralleling C/S
SOCAL	dolphin	2	N	VIS	Non-ASW ship	2	1	10	na	nr	none	na	Surfacing

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

Table S1-ii-5. SOCAL MTE – Individual Marine Mammal Sighting Information: C2X 8 – 19 Jul 2013.

(A) Location	(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
SOCAL	pinniped	5	N	VIS	Non-ASW ship	10	2	10	na	200-500	none	na	Sun bathing
SOCAL	dolphin	10	N	VIS	Non-ASW ship	5	4	10	na	200-500	none	na	Swimming
SOCAL	dolphin	12	N	VIS	Non-ASW ship	3	2	10	na	<200	none	na	Bow riding
SOCAL	pinniped	9	N	VIS	Non-ASW ship	2	1	10	na	200-500	none	na	Playing
SOCAL	whale	1	N	VIS	DDG	2	1	10	N	500-1000	none	na	Opening
SOCAL	dolphin	9	N	VIS	Non-ASW ship	2	2	10	na	500-1000	Maneuvered away	na	Bow riding
SOCAL	dolphin	25	Y	VIS	Non-ASW ship	10	1	8	na	500-1000	none	na	Parallel
SOCAL	dolphin	10	N	VIS	Non-ASW ship	8	2	10	na	500-1000	none	na	Paralleling C/S
SOCAL	whale	2	N	VIS	Non-ASW ship	3	1	10	na	1000-2000	Maneuvered away	na	Blowing, fluking
SOCAL	dolphin	7	N	VIS	DDG	3	nr	nr	N	1000-2000	none	na	Spouts
SOCAL	dolphin	10	N	VIS	DDG	2	nr	nr	N	>2000	none	na	Spouts
SOCAL	whale	1	N	VIS	Non-ASW ship	2	2	10	na	>2000	none	na	Blowing
SOCAL	dolphin	15	N	VIS	DDG	5	nr	nr	N	>2000	none	na	Spouts
SOCAL	dolphin	1	N	VIS	Non-ASW ship	1	2	1	na	200-500	none	na	Paralleling
SOCAL	dolphin	8	N	VIS	Non-ASW ship	5	2	2	na	500-1000	none	na	Circling
SOCAL	dolphin	9	N	VIS	Non-ASW ship	10	2	2	na	500-1000	none	na	Paralleling
SOCAL	whale	1	N	VIS	Non-ASW ship	1	2	10	na	200-500	none	na	Tail Slapping
SOCAL	whale	1	N	VIS	Non-ASW ship	2	2	10	na	500-1000	none	na	Blowing

(A) Location	(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
SOCAL	dolphin	20	N	VIS	Non-ASW ship	2	2	5	na	500-1000	none	na	Paralleling
SOCAL	dolphin	12	N	VIS	Non-ASW ship	1	2	10	na	500-1000	none	na	Paralleling
SOCAL	pinniped	1	N	VIS	Non-ASW ship	2	4	10	na	500-1000	Maneuvered away	na	Dead
SOCAL	dolphin	30	N	VIS	Non-ASW ship	30	1	4	na	>2000	none	na	Parallel
SOCAL	dolphin	50	N	VIS	Non-ASW ship	30	1	10	na	>2000	none	na	Parallel
SOCAL	whale	1	N	VIS	Non-ASW ship	1	1	10	na	>2000	none	na	Paralleling
SOCAL	whale	1	N	VIS	Non-ASW ship	2	2	10	na	<200	none	na	nr
SOCAL	whale	1	N	VIS	Non-ASW ship	1	1	8	na	200-500	none	na	Diving
SOCAL	whale	1	N	VIS	Non-ASW ship	2	1	8	na	200-500	none	na	Diving
SOCAL	pinniped	1	N	VIS	Non-ASW ship	1	1	8	na	500-1000	none	na	Swimming
SOCAL	dolphin	6	N	VIS	Non-ASW ship	1	2	10	na	500-1000	none	na	nr
SOCAL	dolphin	3	Y	VIS	Non-ASW ship	10	1	8	na	500-1000	none	na	Swimming
SOCAL	pinniped	6	N	VIS	Non-ASW ship	3	1	10	na	1000-2000	none	na	nr
SOCAL	dolphin	7	N	VIS	Non-ASW ship	3	1	10	na	1000-2000	none	na	nr
SOCAL	whale	2	N	VIS	Non-ASW ship	10	1	10	na	>2000	Maneuvered away	na	Blowing/swimming
SOCAL	pinniped	1	N	VIS	Non-ASW ship	30	1	10	na	>2000	none	na	Dead/floating
SOCAL	whale	1	N	VIS	Non-ASW ship	2	1	8	na	>2000	none	na	Diving
SOCAL	whale	7	Y	VIS	Non-ASW ship	2	2	10	na	500-1000	none	na	Surface swimming

(A) Location	(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
SOCAL	whale	1	N	VIS	Non-ASW ship	1	2	8	na	>2000	none	na	Blowing/swimming
SOCAL	dolphin	10	N	VIS	Non-ASW ship	1	6	10	na	200-500	none	na	Wake riding
SOCAL	whale	2	N	VIS	Non-ASW ship	2	1	10	na	1000-2000	none	na	Blowing
SOCAL	whale	1	N	VIS	Non-ASW ship	1	1	10	na	1000-2000	none	na	Blowing
SOCAL	dolphin	30	N	VIS	Non-ASW ship	25	2	10	na	500-1000	none	na	Bow riding/playing
SOCAL	dolphin	6	N	VIS	Non-ASW ship	15	1	10	na	>2000	none	na	Jumping/playing

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

Table S1-ii-6. SOCAL MTE – Individual Marine Mammal Sighting Information: IAC II 6 – 15 Nov 2013.

(A) Location	(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
SOCAL	dolphin	1	N	VIS	DDG	5	4	10	N	200-500	none	na	Paralleling o/s
SOCAL	dolphin	1	N	VIS	DDG	5	4	10	N	200-500	none	na	Paralleling o/s
SOCAL	whale	1	N	VIS	DDG	15	3	10	N	>2000	none	na	Blowing
SOCAL	dolphin	5	N	VIS	DDG	10	3	10	N	>2000	none	na	Closing
SOCAL	dolphin	7	N	VIS	DDG	5	2	10	N	200-500	none	na	Closing to bowride
SOCAL	dolphin	20	N	VIS	DDG	1	3	10	N	200-500	none	na	Parallel
SOCAL	dolphin	20	N	VIS	DDG	5	2	10	N	500-1000	none	na	Jumping on surface
SOCAL	dolphin	10	N	VIS	DDG	30	2	10	N	500-1000	none	na	Bowriding
SOCAL	dolphin	50	N	VIS	CG	15	2	10	N	1000-2000	none	na	nr
SOCAL	dolphin	8	N	VIS	DDG	15	1	10	N	500-1000	none	na	Jumping on surface
SOCAL	dolphin	6	Y	VIS	DDG	1	1	10	N	200-500	none	na	Closed then dove under ship
SOCAL	dolphin	6	N	VIS	DDG	1	1	10	N	200-500	none	na	Closed to bowride
SOCAL	dolphin	30	Y	VIS	DDG	20	3	10	N	1000-2000	none	na	Feeding
SOCAL	dolphin	40	Y	VIS	DDG	15	2	10	N	1000-2000	none	na	Jumping on surface
SOCAL	dolphin	10	N	VIS	DDG	180	1	10	N	200-500	none	na	Paralleling o/s
SOCAL	dolphin	30	Y	VIS	DDG	10	1	10	N	1000-2000	none	na	Jumping on surface
SOCAL	generic	1	N	nr	MPRA	nr	5	10	N	nr	none	na	nr
SOCAL	generic	1	N	nr	MPRA	nr	4	10	N	nr	none	na	nr

(A) Location	(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
SOCAL	whale	1	N	VIS	DDG	5	3	10	N	500-1000	none	na	Feeding
SOCAL	dolphin	40	N	VIS	HELO	10	1	10	N	200-500	none	na	nr
SOCAL	generic	1	N	VIS	CG	nr	nr	nr	Y	nr	Shut down sonar	Mammal bearing nr, ship course 175, nr	nr
SOCAL	whale	1	N	VIS	DDG	5	1	10	N	1000-2000	none	na	Surfacing
SOCAL	whale	1	N	VIS	DDG	5	nr	nr	Y	200-500	Powered down sonar	Whale bearing nr, ship course 110, opening ship	nr
SOCAL	whale	2	N	VIS	DDG	5	1	10	N	>2000	none	na	nr
SOCAL	dolphin	8	N	VIS	DDG	5	2	10	Y	<200	none	Dolphins bearing 115, ship course 050, paralleling ship	Bowriding
SOCAL	whale	1	N	VIS	DDG	nr	nr	nr	Y	1000-2000	Powered down sonar	Whale bearing 270, ship course 180, closing ship	nr
SOCAL	generic	1	N	ACO	MPRA	5	5	10	N	nr	none	na	No observation/ aural only
SOCAL	generic	1	N	nr	MPRA	nr	4	10	N	nr	none	na	nr
SOCAL	dolphin	3	N	VIS	DDG	nr	nr	nr	N	<200	none	na	nr
SOCAL	whale	1	N	VIS	CG	5	1	9	N	>2000	none	na	Blowing
SOCAL	dolphin	12	Y	VIS	DDG	12	3	10	Y	200-500	none	Dolphins bearing 020, ship course 130, paralleling ship	Bowriding
SOCAL	whale	1	N	VIS	DDG	5	2	10	N	>2000	none	na	Blowing
SOCAL	whale	1	N	VIS	FFG	3	3	10	N	>2000	Maneuvered away	na	Blowing
SOCAL	dolphin	40	N	VIS	DDG	10	2	10	N	1000-2000	none	na	Pod

(A) Location	(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
SOCAL	dolphin	1	N	VIS	DDG	10	nr	nr	Y	200-500	Powered down sonar	Dolphin bearing 030, ship course 215, nr	nr
SOCAL	whale	1	N	VIS	DDG	1	2	10	Y	200-500	Powered down sonar	Whale bearing 095, ship course 103, paralleling ship	Paralleling
SOCAL	pinniped	1	N	VIS	DDG	2	2	10	N	200-500	none	na	Eating fish
SOCAL	generic	1	N	nr	MPRA	nr	5	10	N	nr	none	na	nr
SOCAL	whale	2	N	VIS	DDG	2	3	10	N	200-500	none	na	Dorsal fins swimming
SOCAL	whale	10	N	VIS	DDG	20	3	10	Y	1000-2000	Shut down sonar	Whales bearing 155, ship course 190, paralleling ship	Logging
SOCAL	whale	15	N	VIS	DDG	3	3	10	Y	500-1000	Shut down sonar	Whales bearing 000, ship course 000, closing ship	Logging
SOCAL	generic	1	N	nr	MPRA	nr	3	10	N	nr	none	na	nr
SOCAL	dolphin	10	N	VIS	DDG	15	2	10	N	200-500	none	na	Parallel C/S
SOCAL	whale	1	N	VIS	CG	3	1	10	Y	>2000	none	Whale bearing 020, ship course 187, nr	Blowing
SOCAL	whale	1	Y	VIS	DDG	5	1	10	N	<200	none	na	Breaching
SOCAL	whale	1	N	VIS	DDG	2	2	10	N	>2000	none	na	Blowing
SOCAL	whale	2	N	VIS	DDG	5	2	10	Y	200-500	Powered down sonar	Whales bearing 165, ship course 150, nr	nr
SOCAL	whale	2	N	VIS	DDG	19	nr	nr	Y	>2000	none	Whales bearing 034, ship course 056, nr	nr
SOCAL	dolphin	100	N	VIS	FFG	5	3	10	N	200-500	Maneuvered away	na	Jumping/bow ride
SOCAL	dolphin	4	N	VIS	DDG	5	1	10	N	500-1000	none	na	Paralleling o/s

(A) Location	(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
SOCAL	dolphin	5	N	VIS	FFG	2	2	10	N	200-500	Maneuvered away	na	Bow ride
SOCAL	dolphin	100	Y	VIS	DDG	3	4	10	N	200-500	none	na	Bowriding
SOCAL	dolphin	10	N	VIS	DDG	10	3	7	N	1000-2000	none	na	On surface
SOCAL	whale	4	N	VIS	DDG	25	1	7	N	1000-2000	none	na	Blowing
SOCAL	whale	1	N	VIS	Non-ASW ship	1	nr	10	na	>2000	none	na	Blow spout

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

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

There were six major training exercises conducted in the SOCAL Range Complex this reporting period (2 Aug 2012 to 25 Dec 2013) (**Table S1-iii-1**). In support of these MTEs, the Navy conducted over 4,161 hours of Marine Species Awareness Training for 2,526 Navy personnel prior to the beginning of these training exercises. Over 74 MTE days the Navy performed over 32,198 hours of visual observation (when counting the number of individual watchstanders engaged in lookout or navigation duties times the number of ships involved times the number of days at-sea) (**Table S1-iii-1**).

Table S1-iii-1. SOCAL Range Complex major training exercises from 2 August 2012 to 25 December 2013.

MTE Type	Dates	# of Days	# of Ships Involved	# of Observation Hours	# of Marine Mammal Sightings	# of Marine Mammals
C2X	17 Oct – 5 Nov 2012	20	9	10,410	83	740
IAC II	29 Oct – 5 Nov 2012	8	9	3,866	88	1,092
JTFEX	6 – 12 Nov 2012	7	9	2,896	29	423
SUSTEX	2 – 18 Apr 2013	17	7	4,072	32	275
C2X	8 – 19 Jul 2013	12	6	2,724	42	337
IAC II	6 – 15 Nov 2013	10	10	8,230	55	635
	Total	**74**	**50**	**32,198**	**329**	**3,502**

Key: C2X= Composite Training Unit Exercise; IAC II= Integrated Anti-Submarine Warfare Course; JTFEX= Joint Task Force Exercise; SUSTEX= Sustainment Exercise

SOCAL Range Complex Major Training Exercise Marine Mammal Observations

There were 329 sightings of an estimated 3,502 marine mammals over the course of six MTEs in the SOCAL Range Complex between 2 August 2012 and 25 December 2013 (**Table S1-iii-1**). Breakdown of sightings by species type are shown in **Table S1-iii-2**.

Table S1-iii-2. Total number of marine mammal sightings observed from Navy platforms during SOCAL Range Complex major training exercises from 2 August 2012 to 25 December 2013.

Species Type	# of Sightings	% of Total Sightings	# of Marine Mammals	% of Total Number of Marine Mammals
Dolphins	144	44%	3,091	88%
Whales	149	45%	314	9%
Pinnipeds	17	5%	78	2%
Turtles	1	<1%	1	<1%
Not recorded	18	5%	18	<1%
Totals:	**329**		**3,502**	

Dolphin species in Southern California typically occur in larger pods than whales, hence the higher number of dolphins and larger percentage of total numbers seen in these counts. During this reporting period, dolphin sightings accounted for 44% of all sightings and 88% of all individuals sighted (**Table S1-iii-2**).

SOCAL Range Complex Major Training Exercise Mitigations

Sonar mitigation – **Table S1-iii-3** shows the number of marine mammal sightings out of the total 329 sightings reported this period (**Table S1-iii-2**) that occurred at ranges less than 1,000 yards and indicates how many sonar mitigations (turn off or power down) were applied (third column in **Table S1-iii-3**). Other sightings within these ranges were instances in which sonar was not on hence sonar mitigation was not necessary (fourth column in **Table S1-iii-3**). Within the sonar mitigation shutdown zone less than 200 yards, there were only three sonar shutdowns applicable to three dolphin sightings (30 total individuals).

Ship maneuvering to avoid marine mammals – There were also 13 instances of Navy ships proactively maneuvering to avoid marine mammals or avoid crossing the path of marine mammals. Of these 13 maneuvers, 8 were to avoid whales (n= 10 whales), 4 were to avoid dolphins (n= 116 dolphins), and 1 was to avoid pinnipeds (n=1 pinniped). There were also 8 instances during this reporting period of bowriding dolphins during MFAS use.

Table S1-iii-3. Number of marine mammal sightings at ranges less than 1,000 yards observed from Navy platforms during major training exercises concurrent with sonar shutdown mitigation from 2 August 2012 to 25 December 2013.

Ranges	Marine Mammal Type	Sightings within a given range with mitigation (i.e., sonar was on prior to sighting and sonar mitigation was applied)	Sightings within a given range with no mitigation required (i.e., sonar not on so sonar mitigation was not needed)
< 200 yards			
	Whales	6 times for 10 whales	5 sightings of 6 whales
	Dolphins	7 times for 100 dolphins*	23 sightings of 354 dolphins
	Pinnipeds	1 time for 2 pinnipeds	1 sightings of 10 pinnipeds
	Turtles	0 times	1 sighting of 1 turtle
200-500 yards			
	Whales	7 times for 12 whales	15 sightings of 19 whales
	Dolphins	5 times for 93 dolphins**	32 sightings of 640 dolphins
	Pinnipeds	1 time for 10 pinnipeds	6 sightings of 32 pinnipeds
	Turtles	0 times	0 sightings
501-1000 yards			
	Whales	10 times for 34 whales	30 sightings of 72 whales
	Dolphins	3 times for 58 dolphins***	34 sightings of 873 dolphins
	Pinnipeds	0 times	3 sightings of 12 pinnipeds
	Turtles	0 times	0 sightings

*includes 4 cases of bowriding dolphins where sonar mitigation was not applied
**includes 2 case of bowriding dolphins where sonar mitigation was not applied
***includes 2 sightings where initial range was 1000 yds and dolphins opened ship; sonar mitigation was not applied

SUMMARY: Mitigation Effectiveness and Navy Safety Zone Adherence

During this year's MTEs in the SOCAL Range Complex, prescribed NMFS mitigation zones were effectively applied in cases of observation of marine mammals within the applicable zone. As detailed in previous Monitoring Reports, there are no sonar power-downs or shut-downs in the case of bowriding dolphins.

The three categories of mitigation measures (Personnel Training, Lookout and Watchstander Responsibility, and Operating Procedures) outlined in the SOCAL Final Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) of December 2008 and approved by NMFS in subsequent LOAs in 2009, 2010, 2011, and 2012 were effective in appropriately mitigating exposure of marine mammals to sonar. Fleet commanders, aircrews 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 with over 4,161 hours completed this year representing training to 2,526 Navy personnel, adherence to required MFAS mitigation zones (**Table S1-iii-3**), and application of lessons learned in marine mammal sighting and reporting.

Table S1-iii-4. SOCAL MTEs where sonar was in use during detection of marine mammals at ranges less than 1,000 yards, and mitigation conducted.

1) Range [SOCAL (S)]	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 [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)	(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	15) Observed behavior
S	C2X	Oct	whale	1	HELO	4	<200	SD	<189	15	None	5,000	Whale bearing 000, helo course nr, nr	nr
S	C2X	Oct	dolphin	10	DDG	5	<200	none	<189	na	<189	na	Dolphins bearing 270, ship course 270, paralleling ship	Bow riding
S	C2X	Oct	dolphin	5	DDG	2	500-1000	PD	<175-181	2	<169-175	667	Dolphins bearing 213, ship course 213, nr	nr
S	C2X	Oct	whale	2	CG	1	<200	PD	<189	5	<179	1,667	Whales bearing 265, ship course 090, opening ship	Crossing port to starboard. Whale sighted for 1 min astern and outside 200 yds at time of mitigation
S	C2X	Oct	whale	1	CG	1	200-500	PD	<181-189	10	<171-179	3,333	Whale bearing 040, ship course 123, paralleling ship	1 whale on stbd bow
S	C2X	Oct	whale	1	CG	2	500-1000	PD	<175-181	30	<169-175	10,000	Whale bearing 010, ship course 277, opening ship	On stbd bow traveling west
S	C2X	Oct	whale	3	CG	3	500-1000	PD	<175-181	3	<169-175	1,000	Whales bearing 090, ship course 315, closing ship	Blowing
S	IAC II	Oct	dolphin	50	DDG	10	<200	none	<189	na	<189	na	Dolphins bearing 100, ship course 120, paralleling ship	Bow riding
S	IAC II	Oct	dolphin	10	DDG	1	<200	SD	<189	5	None	1,667	Dolphins bearing 110, ship course 102, closing ship	Bow riding

1) Range [SOCAL (S)]	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 [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)	(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	15) Observed behavior
S	IAC II	Oct	dolphin	10	DDG	5	200-500	SD	<181-189	5	None	1,667	Dolphins bearing 180, ship course 060, closing ship	Swimming
S	IAC II	Oct	pinniped	10	DDG	8	200-500	SD	<181-189	8	None	2,667	Pinnipeds bearing 030, ship course 104, nr	nr
S	IAC II	Oct	whale	1	CG	3	500-1000	PD	<175-181	12	<169-175	4,000	Whale bearing 180, ship course 090, paralleling ship	Blowing, whale approached briefly then dove
S	IAC II	Oct	dolphin	50	DDG	5	500-1000	none	<175-181	na	<175-181	na	Dolphins bearing 120, ship course 100, opening ship	Blowing. Sighted at 1000 yds and opening
S	IAC II	Oct	whale	5	DDG	11	500-1000	PD	<175-181	11	<169-175	3,667	Whales bearing 200, ship course nr, nr	Whales reported 1000 yards off port bow
S	IAC II	Oct	whale	2	HELO	5	<200	SD	<189	10	None	3,333	Whales bearing 000, helo course nr, nr	nr
S	IAC II	Oct	dolphin	2	DDG	2	<200	MAN	<189	10	<189	3,333	Dolphins bearing 230, ship course 140, opening ship	Bow riding
S	IAC II	Nov	dolphin	5	DDG	1	<200	SD	<189	8	None	2,667	Dolphins bearing 325, ship course 020, opening ship	Jumping
S	IAC II	Nov	dolphin	15	DDG	11	<200	SD	<189	45	None	15,000	Dolphins bearing 015, ship course nr, paralleling ship	Bow riding
S	IAC II	Nov	pinniped	2	DDG	7	<200	SD	<189	13	None	4,333	Pinnipeds bearing 270, ship course nr, opening ship	nr

1) Range [SOCAL (S)]	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 [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)	(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	15) Observed behavior
S	IAC II	Nov	dolphin	20	DDG	1	200-500	none	<181-189	na	<181-189	na	Dolphins bearing 320, ship course 320, nr	Bow riding port bow
S	IAC II	Nov	dolphin	50	DDG	45	200-500	SD	<181-189	45	None	15,000	Dolphins bearing 080, ship course 140, closing ship	Started off the bow, then to port beam
S	IAC II	Nov	whale	2	DDG	10	200-500	SD	<181-189	23	None	7,667	Whales bearing 330, ship course nr, closing ship	Shutdown when mammal reached 200 yards
S	IAC II	Nov	whale	2	DDG	8	200-500	PD	<181-189	13	<171-179	4,333	Whales bearing 330, ship course 330, paralleling ship	Blowing
S	IAC II	Nov	whale	3	DDG	10	200-500	PD	<181-189	6	<171-179	2,000	Whales bearing 020, ship course nr, nr	nr
S	IAC II	Nov	whale	2	DDG	2	500-1000	PD	<175-181	2	<169-175	667	Whales bearing 040, ship course nr, nr	nr
S	IAC II	Nov	whale	3	DDG	7	500-1000	PD	<175-181	7	<169-175	2,333	Whales bearing 050, ship course 060, nr	nr
S	IAC II	Nov	whale	1	DDG	20	500-1000	SD	<175-181	24	None	8,000	Whale bearing 090, ship course nr, nr	nr
S	IAC II	Nov	whale	2	CG	5	500-1000	PD	<175-181	5	<169-175	1,667	Whales bearing 310, ship course 085, paralleling ship	Surfacing
S	JTFEX	Nov	whale	1	DDG	35	<200	SD	<189	5	None	1,667	Whale bearing 270, ship course 350, paralleling ship	Parallel course of ship
S	SUSTEX	Apr	whale	3	DDG	3	<200	SD	<189	5	None	1,667	Whales bearing 270, ship course 015, opening ship	Swimming

1) Range [SOCAL (S)]	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 [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)	(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	15) Observed behavior
S	SUSTEX	Apr	whale	1	HELO	3	<200	SD	<189	3	None	1,000	Whale bearing nr, helo course nr, nr	Surfacing
S	SUSTEX	Apr	whale	1	DDG	5	500-1000	PD	<175-181	5	<169-175	1,667	Whale bearing 050, ship course 030, opening ship	Swimming
S	SUSTEX	Apr	dolphin	3	DDG	4	500-1000	none	<175-181	na	<175-181	na	Dolphins bearing 090, ship course 044, paralleling ship	Paralleling C/S. Sighted at 1000 yds and eventually opened to 1200 yds.
S	IAC II	Nov	dolphin	8	DDG	5	<200	none	<189	na	<189	na	Dolphins bearing 115, ship course 050, paralleling ship	Bowriding
S	IAC II	Nov	whale	1	DDG	5	200-500	PD	<181-189	11	<171-179	3,667	Whale bearing nr, ship course 110, opening ship	nr
S	IAC II	Nov	dolphin	12	DDG	12	200-500	none	<181-189	na	<181-189	na	Dolphins bearing 020, ship course 130, paralleling ship	Bowriding
S	IAC II	Nov	dolphin	1	DDG	10	200-500	PD	<181-189	10	<171-179	3,333	Dolphin bearing 030, ship course 215, nr	nr
S	IAC II	Nov	whale	1	DDG	1	200-500	PD	<181-189	10	<171-179	3,333	Whale bearing 095, ship course 103, paralleling ship	Paralleling
S	IAC II	Nov	whale	2	DDG	5	200-500	PD	<181-189	5	<171-179	1,667	Whales bearing 165, ship course 150, nr	nr
S	IAC II	Nov	whale	15	DDG	3	500-1000	SD	<175-181	15	None	5,000	Whales bearing 000, ship course 000, closing ship	Logging

Notes:
[1] Estimated exposure based on 20Long[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. 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.

nr=not reported; na=not applicable; mitigation not applicable if dolphins were determined to be bowriding.

Exposure assessment

Estimated exposures within 2000 yards can be determined based on standard formulas of how sound propagates in water. Spherical spreading is generally valid within 1000 yards from the sound source, and can be expressed as spreading loss (in dB from a source) equals 20logR (with "R" being range from the source in yards). Spherical spreading loss in the first 1000 yards equates to 60 dB of loss. At ranges between 1000 and 2000 yards the sound waves can become trapped by the sea surface and bottom (depending on water depth and other sound propagation factors) and not 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 $(10\log R_2/R_1)$. Cylindrical spreading loss between 1000 and 2000 yards equates to an additional 3 dB of loss. By the time the sound wave has propagated to 2000 yards, the sonar signal strength has decreased by a total of at least 63 dB. Using the AN/SQS-53 sonar as an example transmitting at 235 dB 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 relative motion of ships and animals at sea, the time spent with any given exposure from surface ships is likely to be limited.

(2) SOCAL – ASW Summary

This section summarizes information from MTEs and non-major training exercises such as unit level training.

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

(U) Total annual hours of each type of sonar source used within the SOCAL Range Complex between 2 August 2012 and 25 December 2013 are contained in the classified version of this Annual Exercise Report that has been submitted to the National Marine Fisheries Service.

Table S2-i-1. Sonar authorized per year within the SOCAL Range Complex by source.

Authorized MFAS sources §216.270 (c)(1) of NMFS SOCAL Final Rule and LOA	Annually Authorized
(i) AN/SQS-53 surface ship hull-mounted active sonar (hours)	1,977
(ii) AN/SQS-56 surface ship hull-mounted active sonar (hours)	494
(iii) AN/BQQ-10 submarine active sonar (hours)	815
(iv) AN/BQS-15 submarine navigational sonar (hours)	122
(v) AN/AQS-22 helicopter active dipping sonar (# of dips) *	2,719
(vi) AN/SSQ-62 DICASS acoustic sonobuoy (# of buoys) **	4,256
(vii) SSQ-125 AEER sonobuoy (# of buoys)***	1,150
(viii) Mk-48 heavyweight torpedoes (# of torpedoes)	87
(ix) Mk-46 lightweight torpedoes (# of torpedoes)	84
(x) AN/SLQ-25 NIXIE acoustic countermeasure (hours)	1,600

* ULT data does not report actual number of dips an aircraft conducted, only the sonar hours. The number of dips shown in this table is based on the modeled estimate of 2 dips per hour, therefore the actual number of dips conducted during ULT events may differ.

** ULT data does not report actual number of buoys deployed, only the sonar hours. DICASS buoy numbers in this table are based on the modeled estimate of 8 buoys per hour, therefore the actual number of buoys used during ULT events may differ.

*** ULT data does not report actual number of buoys deployed, only the sonar hours. AEER buoy numbers in this table are based on an estimate of 6 buoys per hour, therefore the actual number of buoys used during ULT events may differ.

(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 MTEs) 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 SOCAL Range Complex. The Navy shall include (in the SOCAL Range Complex 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. Currently there is not a 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.

(3) SOCAL – SINKEXs

No SINKEXs were conducted in the SOCAL Range Complex during the reporting period.

(4) SOCAL – IEER Summary

The annual summary of use within the SOCAL Range Complex for Improved Extended Echo-Ranging System (IEER) sonobuoys is presented in the classified annual exercise report.

(5) SOCAL – Explosives Summary

The Navy is in the process of improving the methods used to track explosives use within each range complex. Therefore, NMFS requested that the Navy report to the maximum extent practicable as defined in the SOCAL Range Complex Final Rule. The implementation of an automated database that was estimated to be operational for this year's explosive data collection has been delayed due to unanticipated technical and administrative issues. The Navy will continue the development of an automated system to track explosives use within the range complexes. This system will eventually reduce the manpower needed to collect this data and improve reporting accuracy within the SOCAL Range Complex. The summary for maritime explosives use within the SOCAL Range Complex is presented below.

Table S5-1. Explosives use in the SOCAL Range Complex.

(i) Total annual number of each type of explosive exercise			
Authorized Exercise	**Total Annual**	**Amount Annually Authorized**	**% Total Used To Total Authorized**
(A) Surface-to-Surface Gunnery Exercise (S-S GUNNEX)	6	402	2%
(B) Air-to-Surface Missile Exercise (A-S MISSILEX)	0	50	0%
(C) Bombing Exercise (BOMBEX)	0	40	0%
(D) Sinking Exercise (SINKEX)	0	2	0%
(E) EER/IEER/AEER Exercise	*	30	*
(ii) Total annual expended/detonated rounds for each explosive type			
Category			**Quantity**
(A) 5" naval gunfire rounds			329
(B) 76 mm naval gunfire rounds			42
(C) Maverick missiles			0
(D) Harpoon missiles			0
(E) Mk-82 aerial bombs			0
(F) Mk-83 aerial bombs			0

(G) Mk-84 aerial bombs	0
(H) Mk-48 torpedoes (detonations)	0
(I) Demolition charges	9
(J) EER/IEER explosive sonobuoys	*

*classified data.

(U) These explosive numbers were collected manually from several different databases that are maintained by separate entities. The Navy will continue the development of an automated system to track explosives use within the range complexes. This system will eventually reduce the manpower needed to collect this data and improve reporting accuracy within the SOCAL Range Complex.

HAWAII RANGE COMPLEX

INTRODUCTION

The U.S. Navy prepared this Annual Range Complex Exercise Report covering the period from 2 August 2012 to 25 December 2013 in compliance with the National Marine Fisheries Service (NMFS) Final Rule under the Marine Mammal Protection Act (MMPA) for the Hawaii Range Complex (HRC).

In the Hawaii Range Complex Letter of Authorization "Requirements for monitoring and reporting", the following report subsections were specified and are present within this report for the HRC:

(1) Mid-Frequency Active Sonar (MFAS)/High-Frequency Active Sonar (HFAS) Major Training Exercises (MTE).

- (i) Exercise Information (for each MTE).
- (ii) Individual Marine Mammal Sighting Information (for each MTE).
- (iii) Evaluation (based on data gathered during all MTEs) of effectiveness of mitigation measures designed to avoid exposing marine mammals 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) Total sonar hours (dense humpback areas)
- (iii) Total sonar hours (humpback whale cautionary area)
- (iv) Cumulative Impact Report

(3) Sinking Exercises (SINKEX)

- (i) Exercise information
- (ii) Individual marine mammal observation information

(4) Improved Extended Echo Ranging (IEER)/Advanced Extended Echo Ranging (AEER) Summary

- (i) Total number of IEER/AEER events conducted in the HRC
- (ii) Total expended/detonated rounds (buoys)
- (iii) Total number of self-scuttled IEER rounds

(5) Explosives Summary

- (i) Total annual number of each type of explosive exercises
- (ii) Total annual expended/detonated rounds for each explosive type

This Annual Report covers the period from 2 August 2012 to 25 December 2013, and the information represents the best practical data collection for this period. 25 December 2013 marks the end of the data collection and reporting period under the HRC EIS/OEIS. To provide accounting for the entire five year period of the authorization, the Navy will also submit a Comprehensive National Report at the end of the five years to provide totals of authorized usage.

(1) HRC – MFAS/HFAS Major Training Exercises

This section summarizes authorized sonar use and marine mammal observations from MTEs conducted within the HRC between 2 August 2012 and 25 December 2013. For the HRC, MTEs include Rim of the Pacific exercises (RIMPAC), Undersea Warfare Exercises (USWEX), and Multi Strike Group Exercises.

Between 2 August 2012 and 25 December 2013, there was one MTE conducted within the HRC.

Exercise specific details as described in the HRC Final Rule §216.175(f)(1)i to iii and LOA include:

(i) Exercise Information (for each MTE)

(ii) Individual Marine Mammal Sighting Information (for each MTE)

(iii) Evaluation (based on data gathered during all MTEs) of the 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.

(i) Exercise information

Table H1-i-1. MTEs conducted in the HRC.

(A) Exercise	(B) Date	(C) Location	(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 (hrs)	(H) Total hours of all active sonar	(I) Total hours each active source					(J) Wave height (high, low, and average) (ft)
			SQS-53	SQS-56	BQQ-5/10	AQS-22 or 13	SSQ-62 Sonobuoys	SQS-53	SQS-56	SQR-19	BQQ-5/10	AQS-22 or 13	SSQ-53 Sonobuoys	CG	DDG	FFG	SH-60F \MH-60R dipping helo	SH-60B non-dipping helo	Submarines	P-3C MPRA	Non-ASW surface ships			SQS-53	SQS-56	BQQ-5/10	AQS-22 or 13	SSQ-62 Sonobuoys	
USWEX	19 Jan – 23 Jan	H	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	4,944	365	#	#	#	#	#	13,1,7

USWEX=Undersea Warfare Exercise
H=Hawaii Range Complex
# classified data

(ii) Individual marine mammal sighting information by exercise

Table H1-ii-1. HRC MTE – Individual Marine Mammal Sighting Information: USWEX 19 – 23 Jan 2013.

(A) Location	(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
HRC	generic	2	N	ACO	DDG	nr	2	10	Y	>2000	Powered down sonar	Animals bearing 290, ship course 296, closing ship	When within 1000 yds attenuated sonar until mammals were clear
HRC	generic	3	N	ACO	DDG	nr	2	8	Y	>2000	Maneuvered away	Animals bearing 290, ship course 298, closing ship	As unit approached, mammals diverted course
HRC	generic	1	N	ACO	DDG	nr	1	10	N	na	none	na	Acoustic only
HRC	whale	1	N	VIS	MPRA	nr	1	6	N	1000-2000	none	na	Visual on tail slap and full breach
HRC	whale	1	N	ACO	DDG	10	2	10	N	>2000	none	na	Acoustic only
HRC	whale	1	N	ACO	DDG	10	2	10	N	>2000	none	na	Acoustic only

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

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

For the one major training exercise conducted in the Hawaii Range Complex this reporting period (2 Aug 2012 to 25 December 2013), the Navy conducted over 501 hours of Marine Species Awareness Training for over 557 Navy personnel prior to beginning the training events. In addition, over the 5 major training event days in this same period (**Table H1-iii-1**), the Navy performed over 4,944 hours of visual observation (when counting the number of individual watch standers engaged in lookout or navigation duties times the number of ships involved times the number of days at sea). The majority (five of six or 83%) of all marine mammal "sightings" during this exercise were made using passive acoustic detections of marine mammal vocalizations with the listening mode of the associated sonar system.

Table H1-iii-1. HRC MTEs from 2 August 2012 to 25 December 2013.

MTE Type	Month	# of Exercise Days	# of Ships Involved (MFAS and non-MFAS)	# of Marine Mammal Sightings	# of Marine Mammals
USWEX	Jan 2013	5	6	6	9
	Totals:	**5**	**6**	**6**	**9**

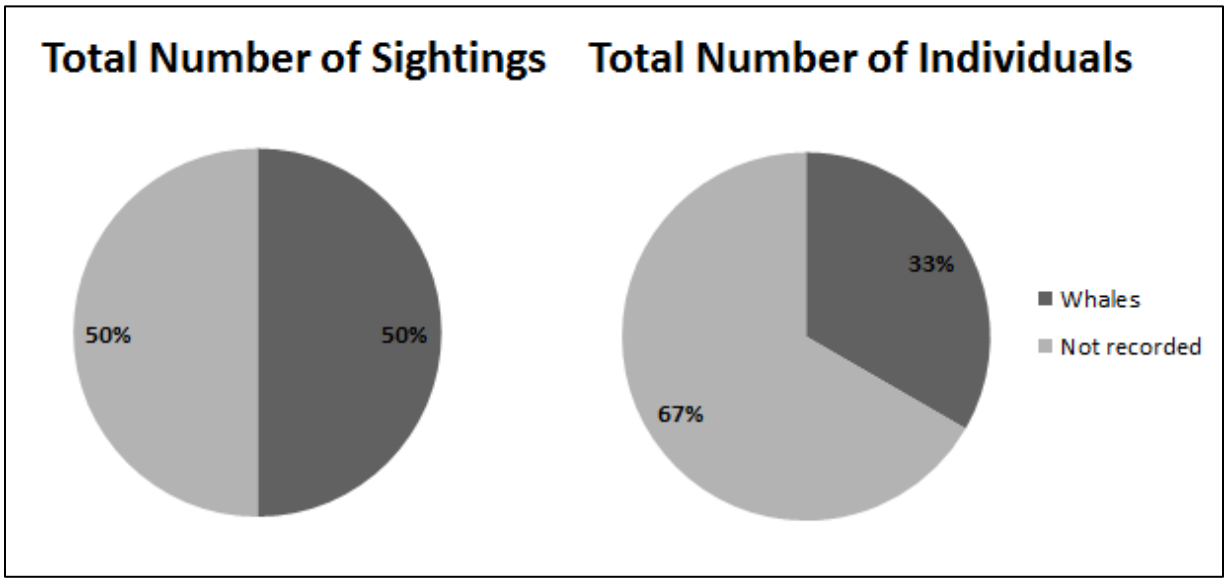
Hawaii Range Complex Major Training Exercise Marine Mammal Observations

There were 6 sightings of at least 9 marine mammals during the one major training exercise in the Hawaii Range Complex. A breakdown of sightings by species is shown in **Table H1-iii-2** and **Figure H1-iii-1**:

Table H1-iii-2. Total number of marine mammal sightings observed from Navy platforms during Hawaii Range Complex major training exercises from 2 August 2012 to 25 December 2013.

Species Type	# of Sightings	% of Total Sightings	# of Marine Mammals	% of Total Number of Marine Mammals
Dolphins	0	0%	0	0%
Whales	3	50%	3	33%
Pinnipeds	0	0%	0	0%
Turtles	0	0%	0	0%
Not recorded	3	50%	6	67%
Totals:	**6**		**9**	

Figure H1-iii-1. Chart of marine mammal sightings (left) and number of individuals by species categories (right) during Hawaii Range Complex major training exercises from 2 August 2012 to 25 December 2013.



Hawaii Range Complex Major Training Event Mitigations

From **Table H1-iii-2**, of the 6 Navy marine mammal sightings during major training exercises this reporting period, there were no sightings within 200 yards that qualified as mitigation events.

There was one instance of a Navy ship powering down active sonar when an unidentified group of 2 mammals was observed closing the ship within 1,000 yds.

SUMMARY: Mitigation Effectiveness and Navy Safety Zone Adherence

During this year's major training exercises in the Hawaii Range Complex, prescribed NMFS safety zones were effectively applied 100% of the time in cases of observation of marine mammals within the applicable safety zone.

The three categories of mitigation measures (Personnel Training, Lookout and Watch Stander Responsibility, and Operating Procedures) outlined in the Hawaii Final Environmental Impact Statement/Overseas Environmental Impact Statement of December 2008 and approved by NMFS in subsequent Letters of Authorization in 2009, 2010, 2011 and 2012 were effective in appropriately mitigating exposure of marine mammals to mid-frequency sonar. During this year's major training exercises, the proscribed NMFS safety zones were adhered to, and vessels and aircraft applied mitigation measures when marine mammals were visually observed within the requisite zone. Fleet commanders, aircrews and ship watch teams continue to improve individual awareness and enhance reporting practices. This improvement can be attributed to the various pre-event conferences, mandatory Marine Species Awareness Training, adherence to required MFAS mitigation zones, and application of lessons learned in marine mammal sighting and reporting.

Table H1-iii-4. HRC MTEs where sonar was on during detection of marine mammals at ranges less than 1,000 yards and mitigation conducted.

1) Range [HRC (H)]	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 [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)	(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	15) Observed behavior
H	USWEX	Jan	generic	2	DDG	nr	>2000	PD	<175	8	<169	2,667	Animals bearing 290, ship course 296, closing ship	When within 1000 yds attenuated sonar until mammals were clear

Notes:
[1]Estimated exposures based on 20Long[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. 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.

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 20logR (with "R" being range from the source in yards). Spherical spreading loss in the first 1000 yards equates to 60 dB of loss. At ranges between 1000 and 2000 yards the sound waves can become trapped by the sea surface and bottom (depending on water depth and other sound propagation factors) and not 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 $(10\log R_2/R_1)$. Cylindrical spreading loss between 1000 and 2000 yards equates to an additional 3 dB of loss. By the time the sound wave has propagated to 2000 yards, the sonar signal strength has decreased by a total of at least 63 dB. Using the AN/SQS-53 sonar as an example transmitting at 235 dB 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 relative motion of ships and animals at sea, the time spent with any given exposure from surface ships is likely to be limited.

(2) HRC – ASW Summary

This section summarizes information from MTEs and non-major training exercises such as unit level training.

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

Total annual hours of each type of sonar source used within the HRC between 2 August 2012 and 25 December 2013 are presented in the classified version of this report. All reporting metrics within the HRC were below the NMFS authorized amount.

Table H2-i-1. Sonar use within the Hawaii Range Complex by source.

Authorized MFAS sources §216.170 (c)(1) of NMFS HRC Final Rule and LOA	Annually Authorized
(i) AN/SQS-53 surface ship hull-mounted active sonar (hours)	1,284
(ii) AN/SQS-56 surface ship hull-mounted active sonar (hours)	383
(iii) AN/AQS-22 or 13 helicopter active dipping sonar (# of dips) *	1,010
(iv) AN/SSQ-62 DICASS acoustic sonobuoy (# of buoys) **	2,423
(v) Mk-48/Mk-46/Mk-54 torpedoes (# of torpedoes)	313
(vi) AN/BQQ-5/10 submarine active sonar (hours)	200

* ULT data does not report actual number of dips an aircraft conducted, only the sonar hours. The number of dips shown in this table is based on the modeled estimate of 2 dips per hour, therefore the actual number of dips conducted during ULT events may differ.

** ULT data does not report actual number of buoys deployed, only the sonar hours. DICASS buoy numbers in this table are based on the modeled estimate of 8 buoys per hour, therefore the actual number of buoys used during ULT events may differ.

(ii) Total Sonar Hours (dense humpback areas)

For the first time during the five-year NMFS authorization, hull-mounted active sonar was used briefly within a dense humpback (as described in the Letter of Authorization and Final Rules for the Hawaii Range Complex) area between 15 December and 15 April. Duration and location of this activity is presented in the classified version of this report.

(iii) Total Sonar Hours (Humpback Whale Cautionary Area)

Hull-mounted active sonar use was not reported within the Humpback Whale Cautionary Area between 15 December 2012 and 15 April 2013 or between 15 December 2013 and 25 December 2013. Hull mounted active sonar was not used at any time within the Humpback Cautionary Area between 15 December and 15 April from January 2009 through December 2013

(iv) 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 RIMPAC, USWEX, or Multi-Strike Group Exercises) 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 HRC. The Navy shall include (in the HRC 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."

Specific to the HRC only, seasonality refers to reporting of total hull-mounted use within Hawaii's "dense humpback areas" and Humpback Whale Cautionary Area between 15 December and 15 April. Hull-mounted sonar was used briefly for the first time during the five-year authorization within the boundary of a "dense humpback area" during this reporting season.

Hull-mounted sonar was not used within the boundaries of the "Humpback Whale Cautionary Area" between 15 December 2012 and 15 April 2013 or between 15 December 2013 and 25 December 2013.

The precise locations and frequency of ASW training is classified. Currently there is not a 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.

(3) HRC – SINKEX

No SINKEX events took place in the HRC between 2 August 2012 and 25 December 2013.

(4) HRC – IEER/AEER Summary

Echo Ranging (AEER) sonobuoys is in the classified annual exercise report. Reporting elements include (i) Total number of IEER/AEER events; (ii) Total expended/detonated rounds (buoys); and (iii) Total number of self-scuttled IEER rounds (buoys).

(5) HRC – Explosives Summary

(U) The Navy is in the process of improving the methods used to track explosives use within each range complex. Therefore, NMFS requested that the Navy report to the maximum extent practicable as defined in the Hawaii Range Complex Final Rule. These explosive numbers were collected manually from several different databases that are maintained by the separate entities. The Navy will continue the development of an automated system to track explosives use within the range complexes. This system will eventually reduce the manpower needed to collect this data and improve reporting accuracy within the Hawaii Range Complex.

(i) Total annual number of each type of explosives exercises (of those identified as part of the "specified activity" under HRC LOA)

Table H5-i-1. Explosives exercises conducted in the HRC.

(i) Total annual number of each type of explosive exercise	Total Annual	Amount Annually Authorized	% Total Used To Total Authorized
(A) Mine Neutralization	1	68	2%
(B) Air-to-Surface Missile Exercise (A-S MISSILEX)	7	50	14%
(C) Surface-to-Surface Missile Exercise (S-S MISSILEX)	0	12	0%
(D) Bombing Exercise (BOMBEX)	37	38	97%
(E) Sinking Exercise (SINKEX)	0	6	0%
(F) Surface-to-Surface Gunnery Exercise (S-S GUNEX)	51	91	56%
(G) Naval Surface Fire Support (NSFS)	3	28	11%
(H) EER/IEER explosive sonobuoys	*	*	*

(U) (ii) Total annual expended/detonated rounds for each explosive type

(U) Table H5-ii-1. Explosives usage in the HRC.

(ii) Total annual expended/detonated rounds for each explosive type	Number
(A) 5" naval gunfire rounds	292
(B) 76 mm naval gunfire rounds	3
(C) Maverick missiles	0
(D) Harpoon missiles	0
(E) Mk-82 aerial bombs	20
(F) Mk-83 aerial bombs	10
(G) Mk-84 aerial bombs	0
(H) Mk-48 torpedoes (detonations)	0
(I) Demolition charges	10
(J) EER/IEER sonobuoys	*

*classified data.