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

1 February 2012

Annual Range Complex Exercise Report

2 August 2011 to 1 August 2012

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

1 October 2012

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SOUTHERN CALIFORNIA RANGE COMPLEX

INTRODUCTION

The U.S. Navy prepared this Annual Range Complex Exercise Report covering the period from 2 August 2011 to 1 August 2012 in compliance with the National Marine Fisheries Service (NMFS) Final Rule under the Marine Mammal Protection Act (MMPA) for the 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 2011 to 1 August 2012, and the information represents the best practical data collection for this period. The data collection and reporting timeline differs from the actual LOA dates. In order to provide a better representation of annual exercise data for the SOCAL Range Complex, the Navy has combined all exercise data from 2 August 2011 to 1 August 2012 and compared it to the annual allocations provided in the 1 February 2012 SOCAL Letter of Authorization. This representation of annual exercise data shall be repeated in future Annual Reports. To provide accounting for the entire five year period of the authorization, the Navy will also submit a final report at the end of the five years to provide comprehensive totals of authorized usage. All classified data is forwarded to the National Marine Fisheries Service in a separate classified annual exercise report.

(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 2011 and 1 August 2012.

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 seven MTEs within the SOCAL Range Complex between 2 August 2011 and 1 August 2012. 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
SUSTEX	17 Sep – 29 Sep	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	12,048	204	#	#	#	#	#	#	#	5,1,3
IAC II	21 Sep – 23 Sep	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	3,615	194	#	#	#	#	#	#	#	5,1,3
C2X	22 Sep – 11 Oct	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	12,052	401	#	#	#	#	#	#	#	5,1,2
IAC II	25 Sep – 27 Sep	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	2,127	302	#	#	#	#	#	#	#	5,1,2
JTFEX	1 Oct – 5 Oct	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	6,025	484	#	#	#	#	#	#	#	5,1,3
SUSTEX	5 Jul – 18 Jul	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	6,297	160	#	#	#	#	#	#	#	9,5,3
IAC II	12 Jul – 14 Jul	S	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	1,718	236	#	#	#	#	#	#	#	9,5,3

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

* Submarine mid-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: SUSTEX 17 – 29 Sep 2011.

(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 (mm)	(J) Sonar source in use (y/n)	(K) Range (yds)	(L) Mitigation implemented	(M) If source in use (J) is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion relative to ship	(N) Observed behavior
SOCAL	whale	1	N	VIS	CG	1	3	10	N	1000-2000	na	na	Swimming
SOCAL	whale	1	N	VIS	CG	2	3	10	N	1000-2000	na	na	Swimming
SOCAL	whale	1	N	VIS	CG	5	5	8	N	>2000	na	na	Swimming
SOCAL	whale	2	N	VIS	CG	3	6	10	N	1000-2000	na	na	Swimming
SOCAL	whale	1	N	VIS	FFG	2	2	4	N	<200	Maneuvered away	na	Opening
SOCAL	whale	1	N	VIS	FFG	2	2	4	N	<200	Maneuvered away	na	Opening
SOCAL	whale	1	N	VIS	CG	2	4	10	N	1000-2000	na	na	Swimming
SOCAL	pinniped	4	N	VIS	DDG	2	1	10	Y	200-500	Shut down sonar	Pinnipeds bearing 040, ship course 090, opening ship	Opening
SOCAL	dolphin	5	N	VIS	DDG	5	1	10	Y	500-1000	none	Dolphins bearing 180, ship course 183, paralleling ship	Paralleling
SOCAL	pinniped	1	N	VIS	DDG	10	1	10	Y	1000-2000	Shut down sonar	Pinniped bearing 353, ship course 350, opening ship	Opening
SOCAL	dolphin	50	N	VIS	DDG	15	1	10	N	1000-2000	na	na	Paralleling
SOCAL	dolphin	7	N	VIS	Non-ASW ship	3	2	5	na	<200	na	na	Bowriding
SOCAL	dolphin	50	N	VIS	DDG	30	2	10	N	>2000	na	na	Paralleling ship and breaching surface

SOCAL	whale	1	N	VIS	CG	2	2	10	N	500-1000	na	na	Swimming
SOCAL	dolphin	35	N	VIS	CG	3	2	10	Y	1000-2000	Shut down sonar	Dolphins bearing 330, ship course 200, paralleling ship	Swimming
SOCAL	dolphin	12	N	VIS	MPRA	10	4	10	N	>2000	na	na	Jumping
SOCAL	dolphin	10	N	VIS	Non-ASW ship	10	5	10	na	<200	na	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 21 – 23 Sep 2011.

(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	100	N	VIS	Non-ASW ship	30	2	10	na	<200	na	na	Float
SOCAL	dolphin	10	N	VIS	DDG	10	2	10	Y	>2000	na	Dolphins bearing 000, ship course 270, opening ship	nr
SOCAL	dolphin	25	N	VIS	CG	5	2	6	Y	500-1000	Powered down sonar	Dolphins bearing 084, ship course 264, closing ship	Swimming
SOCAL	dolphin	50	N	VIS	CG	15	5	10	Y	200-500	Shut down sonar	Dolphins bearing 335, ship course 315, paralleling ship	Swimming
SOCAL	dolphin	6	N	VIS	FFG	2	1	8	Y	500-1000	none	Dolphins bearing 160, ship course 160, closing ship	nr
SOCAL	dolphin	8	N	VIS	DDG	4	1	10	Y	500-1000	none	Dolphins bearing 165, ship course 30, paralleling ship	Paralleling
SOCAL	dolphin	6	N	VIS	Non-ASW ship	5	1	7	na	1000-2000	na	na	Parallel
SOCAL	dolphin	100	N	VIS	Non-ASW ship	5	1	7	na	1000-2000	na	na	Bowriding
SOCAL	dolphin	5	N	VIS	Non-ASW ship	1	1	7	na	1000-2000	na	na	Parallel
SOCAL	dolphin	39	N	VIS	Non-ASW ship	2	1	7	na	1000-2000	na	na	Bowriding
SOCAL	dolphin	8	N	VIS	Non-ASW ship	1	2	8	na	1000-2000	na	na	Parallel
SOCAL	dolphin	50	N	VIS	Non-ASW ship	10	1	7	na	1000-2000	na	na	Bowriding
SOCAL	dolphin	29	N	VIS	Non-ASW ship	3	1	7	na	1000-2000	na	na	Parallel
SOCAL	dolphin	10	N	VIS	Non-ASW ship	1	1	7	na	>2000	na	na	Bowriding
SOCAL	dolphin	27	N	VIS	Non-ASW ship	1	1	7	na	>2000	na	na	Parallel

SOCAL	dolphin	10	N	VIS	Non-ASW ship	10	1	7	na	>2000	na	na	Closing
SOCAL	pinniped	3	N	VIS	FFG	3	3	10	Y	<200	none	Pinnipeds bearing 050, ship course 016, nr	nr
SOCAL	dolphin	15	N	VIS	CG	10	3	6	Y	500-1000	Powered down sonar	Dolphins bearing 280, ship course 180, opening ship	nr
SOCAL	dolphin	2	N	VIS	FFG	6	1	6	N	500-1000	na	na	nr
SOCAL	dolphin	10	N	VIS	CG	10	3	6	Y	200-500	Shut down sonar	Dolphins bearing 180, ship course 180, closing ship	nr
SOCAL	dolphin	5	N	VIS	FFG	5	1	7	N	500-1000	na	na	nr
SOCAL	dolphin	20	N	VIS	CG	15	3	6	Y	1000-2000	Shut down sonar	Dolphins bearing 000, ship course 090, closing ship	nr
SOCAL	dolphin	6	N	VIS	CG	10	3	6	Y	nr	Shut down sonar	Dolphins bearing 285, ship course 295, closing ship	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: C2X 22 Sep – 11 Oct 2011.

(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	1	N	VIS	DDG	2	4	6	N	200-500	na	na	Seal swimming on surface
SOCAL	dolphin	40	N	VIS	CG	2	1	4	N	500-1000	na	na	nr
SOCAL	pinniped	1	N	VIS	DDG	2	3	10	Y	500-1000	Shut down sonar	Pinniped bearing 330, ship course 246, paralleling ship	nr
SOCAL	dolphin	10	N	VIS	DDG	2	3	10	Y	500-1000	Powered down sonar	Dolphins bearing 310, ship course 340, paralleling ship	Pod of dolphins swimming in area
SOCAL	dolphin	15	N	VIS	DDG	4	2	8	N	500-1000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	1000-2000	na	na	nr
SOCAL	dolphin	70	N	VIS	DDG	36	1	9	N	1000-2000	na	na	nr
SOCAL	dolphin	5	N	VIS	DDG	4	2	8	N	1000-2000	na	na	nr
SOCAL	dolphin	45	N	VIS	DDG	2	1	9	N	>2000	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	2	1	4	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	1	5	N	na	na	na	nr
SOCAL	dolphin	2	N	VIS	DDG	1	1	10	N	<200	na	na	nr
SOCAL	dolphin	7	N	VIS	DDG	3	1	10	N	<200	na	na	nr
SOCAL	pinniped	3	N	VIS	DDG	12	1	9	N	<200	na	na	nr
SOCAL	dolphin	5	N	VIS	DDG	30	2	10	Y	<200	Shut down sonar	Dolphins bearing 270, ship course 300, paralleling ship	Bowriding
SOCAL	dolphin	12	N	VIS	DDG	5	3	10	N	200-500	na	na	nr

SOCAL	dolphin	15	N	VIS	DDG	2	2	10	Y	200-500	Shut down sonar	Dolphins bearing 200, ship course 122, opening ship	Blowing
SOCAL	dolphin	10	N	VIS	DDG	2	2	8	N	200-500	na	na	nr
SOCAL	whale	1	N	VIS	DDG	2	2	8	N	200-500	na	na	nr
SOCAL	dolphin	1	N	VIS	DDG	nr	nr	nr	Y	500-1000	Powered down sonar	Dolphin bearing nr, ship course 221, nr	nr
SOCAL	dolphin	12	N	VIS	MPRA	15	4	10	N	500-1000	na	na	Dolphins jumping with natural waves
SOCAL	dolphin	10	N	VIS	DDG	2	1	9	N	1000-2000	na	na	nr
SOCAL	dolphin	1	N	VIS	DDG	nr	nr	nr	N	nr	na	na	Swimming
SOCAL	dolphin	15	N	VIS	CG	6	2	10	N	200-500	na	na	nr
SOCAL	whale	1	N	VIS	DDG	3	1	10	N	1000-2000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	2	1	10	Y	1000-2000	na	Whale bearing 125, ship course 270, opening ship	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	500-1000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	2	1	10	N	1000-2000	na	na	nr
SOCAL	dolphin	1	N	ACO	DDG	nr	nr	nr	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	Y	na	na	Dolphin bearing nr, ship course 120, nr	nr
SOCAL	whale	1	N	VIS	Non-ASW ship	10	4	10	N	1000-2000	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	30	N	VIS	DDG	2	5	8	N	<200	na	na	nr
SOCAL	dolphin	10	N	VIS	CG	5	7	10	N	1000-2000	na	na	nr

SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	whale	6	Y	VIS	CG	2	2	10	N	500-1000	na	na	nr
SOCAL	whale	1	N	VIS	MPRA	nr	nr	nr	N	nr	na	na	Blue whale
SOCAL	whale	1	N	VIS	DDG	3	3	10	Y	500-1000	Powered down sonar	Whale bearing 230, ship course 315, paralleling ship	Sighted one whale breached
SOCAL	whale	2	N	VIS	Non-ASW ship	3	3	10	N	1000-2000	na	na	Possible Minke
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	whale	1	N	VIS	CG	1	2	10	N	500-1000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	2	3	10	Y	500-1000	Powered down sonar	Whale bearing 110, ship course 162, paralleling ship	One whale sighted with spout
SOCAL	whale	3	N	VIS	Non-ASW ship	10	3	10	N	1000-2000	na	na	Possible Minke
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	whale	1	N	VIS	CG	nr	nr	nr	Y	nr	Shut down sonar	Whale bearing nr, ship course 008, nr	nr
SOCAL	generic	1	N	VIS	CG	nr	nr	nr	Y	nr	na	Mammal bearing nr, ship course 172, nr	nr
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	200-500	na	na	Blowing
SOCAL	dolphin	8	N	VIS	DDG	5	2	10	N	500-1000	na	na	nr
SOCAL	dolphin	15	N	VIS	DDG	15	1	8	N	500-1000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	3	1	10	N	500-1000	na	na	nr
SOCAL	dolphin	20	N	VIS	DDG	5	1	10	N	500-1000	na	na	nr
SOCAL	whale	3	N	VIS	CG	nr	2	10	N	1000-2000	na	na	nr

SOCAL	whale	1	N	VIS	DDG	1	1	10	N	nr	na	na	Blowing perpendicular to own ship
SOCAL	dolphin	10	N	VIS	DDG	2	2	9	N	<200	na	na	nr
SOCAL	dolphin	4	N	VIS	DDG	1	1	10	N	200-500	na	na	nr
SOCAL	dolphin	5	N	VIS	DDG	3	4	9	N	500-1000	na	na	nr
SOCAL	dolphin	30	N	VIS	DDG	4	2	8	N	200-500	na	na	nr
SOCAL	dolphin	7	N	VIS	DDG	2	2	8	N	200-500	na	na	nr
SOCAL	dolphin	200	N	VIS	CG	nr	3	10	N	500-1000	na	na	nr
SOCAL	dolphin	5	N	VIS	DDG	4	1	10	N	500-1000	na	na	nr
SOCAL	dolphin	20	N	VIS	DDG	1	1	9	N	1000-2000	na	na	nr
SOCAL	dolphin	50	N	VIS	Non-ASW ship	15	4	10	N	>2000	na	na	nr
SOCAL	dolphin	20	N	VIS	DDG	2	2	10	N	1000-2000	na	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: IAC II 25 – 27 Sep 2011.

(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	100	N	VIS	DDG	5	5	9	Y	<200	Shut down sonar	Dolphins bearing 180, ship course 161, opening ship	nr
SOCAL	dolphin	100	N	VIS	DDG	5	5	9	N	<200	na	na	nr
SOCAL	dolphin	50	N	VIS	CG	3	1	10	N	500-1000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	1	3	10	N	500-1000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	3	1	10	N	1000-2000	na	na	nr
SOCAL	dolphin	1	N	ACO	DDG	7	nr	nr	N	na	na	na	nr
SOCAL	dolphin	10	N	VIS	DDG	1	1	10	Y	<200	none	Dolphins bearing 000, ship course 270, paralleling ship	Bowriding
SOCAL	dolphin	5	N	VIS	DDG	5	2	10	Y	<200	Shut down sonar	Dolphins bearing 090, ship course 165, nr	nr
SOCAL	dolphin	8	N	VIS	DDG	20	3	10	N	<200	na	na	Bowriding
SOCAL	dolphin	300	N	VIS	DDG	15	2	10	Y	200-500	none	Dolphins bearing 030, ship course 030, nr	nr
SOCAL	pinniped	1	N	VIS	DDG	3	2	10	Y	500-1000	Powered down sonar	Pinniped bearing 120, ship course 180, opening ship	Sea lion swimming on surface
SOCAL	dolphin	1	N	VIS	DDG	4	nr	nr	Y	1000-2000	Powered down sonar	Dolphin bearing 329, ship course 329, nr	nr
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	1000-2000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	2	1	10	N	1000-2000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	1	2	10	Y	1000-2000	Powered down sonar	Whale bearing 090, ship course 057, opening ship	Blowing

SOCAL	dolphin	1	N	VIS	DDG	nr	nr	nr	Y	nr	na	Dolphin bearing 230, ship course 233, nr	nr
SOCAL	generic	1	N	ACO	CG	20	3	10	Y	na	Powered down sonar	Mammal bearing 270, ship course 270, nr	nr
SOCAL	generic	1	N	ACO	CG	15	3	10	Y	na	na	Mammal bearing 120, ship course 120, nr	nr
SOCAL	dolphin	20	N	VIS	DDG	3	2	10	Y	200-500	Shut down sonar	Dolphins bearing 190, ship course 205, opening ship	nr
SOCAL	dolphin	20	N	VIS	DDG	2	2	10	Y	200-501	Shut down sonar	Dolphins bearing 350, ship course 312, opening ship	nr
SOCAL	dolphin	12	N	VIS	DDG	4	1	6	N	500-1000	na	na	nr
SOCAL	dolphin	2	N	VIS	DDG	1	1	6	Y	500-1000	Shut down sonar	Dolphins bearing 220, ship course 263, paralleling ship	nr
SOCAL	dolphin	12	N	VIS	DDG	1	3	10	Y	500-1000	Shut down sonar	Dolphins bearing 310, ship course 210, opening ship	nr
SOCAL	dolphin	8	N	VIS	DDG	3	2	6	Y	500-1000	Shut down sonar	Dolphins bearing 180, ship course 198, paralleling ship	nr
SOCAL	dolphin	12	N	VIS	DDG	10	1	6	Y	1000-2000	Shut down sonar	Dolphins bearing 342, ship course 000, opening ship	nr
SOCAL	dolphin	8	N	VIS	DDG	3	1	6	N	1000-2000	na	na	nr
SOCAL	dolphin	15	N	VIS	DDG	3	1	6	N	1000-2000	na	na	nr
SOCAL	dolphin	80	N	VIS	CG	5	1	5	N	>2000	na	na	nr
SOCAL	dolphin	80	N	VIS	CG	3	1	5	N	>2000	na	na	nr
SOCAL	generic	1	N	VIS	HELO	nr	nr	nr	N	nr	Delayed sonar	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	1	5	N	na	na	na	nr

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: JTFEX 1 – 5 Oct 2011.

(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) is hull-mounted, true bearing of animal from ship, true direction of ship's travel, and estimation of animal's motion	(N) Observed behavior
SOCAL	whale	1	N	VIS	Non-ASW ship	20	3	10	na	1000-2000	na	na	Spouting
SOCAL	whale	1	N	VIS	CG	1	5	10	Y	500-1000	Shut down sonar	Whale bearing 085, ship course 110, paralleling ship	Floating
SOCAL	whale	3	N	VIS	DDG	25	2	10	Y	1000-2000	na	Whales bearing 200, ship course 270, opening ship	nr
SOCAL	dolphin	1	N	VIS	DDG	15	3	10	N	>2000	na	na	Riding waves
SOCAL	dolphin	30	N	VIS	DDG	8	4	10	N	<200	na	na	nr
SOCAL	whale	3	N	VIS	DDG	3	5	10	N	1000-2000	na	na	nr
SOCAL	whale	1	N	VIS	DDG	1	4	10	N	1000-2000	na	na	nr
SOCAL	generic	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	50	N	VIS	CG	4	5	10	Y	1000-2000	Shut down sonar	Dolphins bearing 040, ship course 320, paralleling ship	Swimming
SOCAL	generic	1	N	ACO	CG	5	2	10	Y	na	na	Mammal bearing nr, ship course 120, nr	nr
SOCAL	dolphin	10	N	VIS	CG	10	4	10	N	1000-2000	na	na	Bowriding
SOCAL	whale	1	N	VIS	Non-ASW ship	10	4	10	N	1000-2000	na	na	nr
SOCAL	generic	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	generic	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	generic	1	N	ACO	CG	5	2	10	N	na	na	na	nr
SOCAL	dolphin	1	N	ACO	CG	5	2	10	N	na	na	na	nr

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: SUSTEX 5 – 18 Jul 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	whale	1	N	VIS	DDG	1	1	10	N	500-1000	na	na	Only observed spout
SOCAL	dolphin	40	N	VIS	DDG	1	1	10	N	<200	na	na	Moving in large pod crossing bow of ship
SOCAL	whale	1	N	VIS	DDG	1	6	10	N	500-1000	Maneuvered away	na	Crossed stbd to port
SOCAL	whale	1	N	VIS	DDG	1	6	10	N	>2000	na	na	Crossed port to stbd
SOCAL	whale	1	N	VIS	DDG	1	6	10	N	>2000	na	na	Crossed port to stbd
SOCAL	whale	1	N	VIS	DDG	1	6	10	N	>2000	na	na	Crossed port to stbd
SOCAL	whale	1	N	VIS	CG	1	4	10	N	500-1000	Maneuvered away	na	Blowing
SOCAL	whale	1	N	VIS	CG	3	4	10	N	500-1000	Maneuvered away	na	Blowing
SOCAL	whale	1	N	VIS	CG	1	4	10	N	500-1000	Maneuvered away	na	Blowing
SOCAL	whale	1	N	VIS	CG	1	4	10	N	500-1000	Maneuvered away	na	Blowing
SOCAL	whale	2	N	VIS	CG	3	4	10	N	1000-2000	Maneuvered away	na	Blowing
SOCAL	whale	1	N	VIS	CG	4	4	10	N	1000-2000	Maneuvered away	na	Blowing
SOCAL	whale	1	N	VIS	DDG	2	2	5	N	1000-2000	Maneuvered away	na	Blowing
SOCAL	whale	1	N	VIS	DDG	5	2	5	n	1000-2000	Maneuvered away	na	Blowing
SOCAL	whale	1	N	VIS	CG	2	2	10	N	1000-2000	Maneuvered away	na	Blowing
SOCAL	whale	1	N	VIS	DDG	1	4	10	n	>2000	na	na	Only observed spout

SOCAL	dolphin	30	N	VIS	DDG	1	2	10	N	<200	na	na	Only observed spout
SOCAL	whale	1	N	VIS	DDG	1	3	10	N	<200	na	na	Only observed spout
SOCAL	whale	1	N	VIS	DDG	5	2	10	N	200-500	na	na	Only observed spout
SOCAL	whale	3	N	VIS	DDG	10	2	5	N	1000-2000	Maneuvered away	na	On surface
SOCAL	dolphin	30	N	VIS	DDG	30	2	10	N	1000-2000	na	na	Only observed spout
SOCAL	dolphin	30	N	VIS	DDG	30	5	10	N	1000-2000	na	na	Only observed spout
SOCAL	whale	2	N	VIS	CG	5	3	10	N	>2000	na	na	Spout blowing
SOCAL	whale	1	N	VIS	DDG	1	1	10	N	<200	na	na	Only observed spout
SOCAL	whale	3	N	VIS	CG	1	4	10	N	500-1000	Maneuvered away	na	Blowing
SOCAL	whale	2	N	VIS	CG	3	4	10	N	1000-2000	Maneuvered away	na	Blowing
SOCAL	dolphin	12	N	VIS	CG	3	3	5	N	1000-2000	na	na	Swimming in pod
SOCAL	dolphin	25	N	VIS	DDG	6	1	6	N	1000-2000	na	na	Bowriding
SOCAL	whale	1	N	VIS	CG	4	4	10	N	1000-2000	Maneuvered away	na	Blowing
SOCAL	pinniped	1	N	VIS	DDG	7	2	6	N	1000-2000	na	na	On surface
SOCAL	whale	1	N	VIS	DDG	1	3	10	N	1000-2000	na	na	On surface
SOCAL	dolphin	100	y	VIS	CG	20	1	10	N	>2000	na	na	Bowriding
SOCAL	whale	2	N	VIS	CG	5	2	10	N	>2000	na	na	Breaching
SOCAL	dolphin	30	N	VIS	DDG	2	3	10	N	1000-2000	na	na	Opening

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

Table S1-ii-7. SOCAL MTE – Individual Marine Mammal Sighting Information: IAC II 12 – 14 Jul 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	30	N	VIS	DDG	6	3	10	Y	1000-2000	Maneuvered away	Dolphins bearing 290, ship course 240, paralleling ship	Parallel ship
SOCAL	dolphin	35	N	VIS	DDG	10	2	6	N	1000-2000	na	na	Bowriding
SOCAL	whale	3	N	VIS	CG	10	1	7	N	>2000	na	na	Swimming in pod
SOCAL	whale	3	Y	VIS	CG	5	1	7	N	>2000	na	na	Swimming in pod
SOCAL	whale	1	N	VIS	DDG	2	3	6	Y	200-500	Shut down sonar	Whale bearing 260, ship course 270, opening ship	Blowing
SOCAL	dolphin	40	Y	VIS	DDG	1	4	6	Y	200-500	Powered down sonar	Dolphins bearing 240, ship course 266, opening ship	nr
SOCAL	whale	4	N	VIS	DDG	5	3	6	N	200-500	na	na	Blowing
SOCAL	whale	1	N	VIS	DDG	1	2	10	Y	500-1000	Shut down sonar	Whale bearing 345, ship course 349, closing ship	nr
SOCAL	whale	1	N	VIS	DDG	1	4	8	Y	500-1000	none	Whale bearing 270, ship course 270, opening ship	Blowing
SOCAL	whale	1	N	VIS	DDG	1	2	10	Y	500-1000	Powered down sonar	Whale bearing 090, ship course 281, nr	nr
SOCAL	whale	1	N	VIS	DDG	15	3	6	Y	1000-2000	Powered down sonar	Whale bearing 260, ship course 270, opening ship	Blowing
SOCAL	dolphin	30	Y	VIS	DDG	6	4	10	Y	1000-2000	Maneuvered away	Dolphins bearing 290, ship course 267, closing ship	Bowriding
SOCAL	dolphin	35	Y	VIS	DDG	10	3	6	Y	1000-2000	Maneuvered away	Dolphins bearing 220, ship course 060, closing ship	Bowriding

SOCAL	whale	1	N	VIS	DDG	1	3	10	N	1000-2000	na	na	nr
SOCAL	whale	2	N	VIS	DDG	1	1	10	Y	>2000	na	Whales bearing 205, ship course 328, nr	nr
SOCAL	whale	1	N	VIS	DDG	1	2	10	Y	>2000	na	Whale bearing 169, ship course 091, nr	nr
SOCAL	whale	1	N	VIS	DDG	3	4	7	Y	200-500	none	Whale bearing 168, ship course 211, nr	Blowing
SOCAL	dolphin	10	N	VIS	CG	15	2	10	N	500-1000	na	na	Bowriding
SOCAL	whale	2	N	VIS	CG	2	6	7	N	1000-2000	na	na	Swimming in pod
SOCAL	whale	2	N	VIS	CG	2	6	7	N	>2000	na	na	Swimming in pod
SOCAL	whale	2	Y	VIS	DDG	5	5	8	Y	>2000	na	Whales bearing 120, ship course 209, nr	nr

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 seven major training exercises conducted in the SOCAL Range Complex this reporting period (2 Aug 2011 to 1 Aug 2012) (**Table S1-iii-1**). In support of these MTEs, the Navy conducted over 2,934 hours of Marine Species Awareness Training for 2,634 Navy personnel prior to the beginning of these training exercises. Over 61 MTE days the Navy performed over 43,882 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 2011 to 1 August 2012.

MTE Type	Dates	# of Days	# of Ships Involved	# of Observation Hours	# of Marine Mammal Sightings	# of Marine Mammals
SUSTEX	17 – 29 Sep 2011	13	#	12,048	17	183
IAC II	21 – 23 Sep 2011	3	#	3,615	23	544
C2X	22 Sep – 11 Oct 2011	20	#	12,052	77	766
IAC II	25 – 27 Sep 2011	3	#	2,127	31	855
JTFEX	1 – 5 Oct 2011	5	#	6,025	17	108
SUSTEX	5 – 18 Jul 2012	14	#	6,297	34	331
IAC II	12 – 14 Jul 2012	3	#	1,718	21	206
Total		61	#	43,882	220	2,993

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

SOCAL Range Complex Major Training Exercise Marine Mammal Observations

There were 220 sightings of an estimated 2,993 marine mammals over the course of seven MTEs in the SOCAL Range Complex between 2 August 2011 and 1 August 2012 (**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 2011 to 1 August 2012.

Species Type	# of Sightings	% of Total Sightings	# of Marine Mammals	% of Total Number of Marine Mammals
Dolphins	125	57%	2,857	95%
Whales	78	35%	112	4%
Pinnipeds	8	4%	15	<1%
Not recorded	9	4%	9	<1%
Totals:	220		2,993	

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 57% of all sightings and 95% 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 220 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 (110 total individuals).

Ship maneuvering to avoid marine mammals - There were also 19 instances of Navy ships proactively maneuvering to avoid marine mammals or avoid crossing the path of marine mammals.

Of these 19 maneuvers, 16 were to avoid whales (n= 22 whales), and 3 were to avoid dolphins (n= 95 dolphins). There were also two 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 2011 to 1 August 2012.

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	0 times	4 sightings of 4 whales
	Dolphins	3 times for 110 dolphins	13 sightings of 384 dolphins
	Pinnipeds	0 times	2 sightings of 6 pinnipeds
200-500 yards			
	Whales	1 time for 1 whale	5 sightings of 8 whale
	Dolphins	6 times for 155 dolphins	7 sightings of 378 dolphins
	Pinnipeds	1 time for 4 pinnipeds	1 sighting of 1 pinniped
500-1000 yards			
	Whales	5 times for 5 whales	28 sightings of 48 whales
	Dolphins	11 times for 156 dolphins	32 sightings of 796 dolphins
	Pinnipeds	3 times for 3 pinnipeds	0 sightings

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 2,934 hours completed this year representing training to 2,634 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	IAC II	Sep	dolphin	25	CG	5	500-1000	PD	<175-181	5	<169-175	1,667	Dolphins bearing 084, ship course 264, closing ship	Swimming
S	IAC II	Sep	dolphin	50	CG	15	200-500	SD	<181-189	15	None	5,000	Dolphins bearing 335, ship course 315, paralleling ship	Swimming
S	IAC II	Sep	dolphin	6	FFG	2	500-1000	None	<165-171	na	<165-171	na	Dolphins bearing 160, ship course 160, closing ship	nr
S	IAC II	Sep	dolphin	8	DDG	4	500-1000	None	<175-181	na	<175-181	na	Dolphins bearing 165, ship course 30, paralleling ship	Paralleling
S	IAC II	Sep	pinniped	3	FFG	3	<200	None	<179	na	<179	na	Pinnipeds bearing 050, ship course 016, nr	nr
S	IAC II	Sep	dolphin	15	CG	10	500-1000	PD	<175-181	10	<169-175	3,333	Dolphins bearing 280, ship course 180, opening ship	nr
S	IAC II	Sep	dolphin	10	CG	10	200-500	SD	<181-189	10	None	3,333	Dolphins bearing 180, ship course 180, closing ship	nr
S	SUSTEX	Sep	pinniped	4	DDG	2	200-500	SD	<181-189	2	None	667	Pinnipeds bearing 040, ship course 090, opening ship	Opening
S	SUSTEX	Sep	dolphin	5	DDG	5	500-1000	None	<175-181	na	<175-181	na	Dolphins bearing 180, ship course 183, paralleling ship	Paralleling
S	C2X	Sep	pinniped	1	DDG	2	500-1000	SD	<175-181	2	None	667	Pinniped bearing 330, ship course 246,	nr

													paralleling ship	
S	C2X	Sep	dolphin	10	DDG	2	500-1000	PD	<175-181	10	<169-175	3,333	Dolphins bearing 310, ship course 340, paralleling ship	Pod of dolphins swimming in area
S	C2X	Sep	dolphin	5	DDG	30	<200	SD	<189	42	None	14,000	Dolphins bearing 270, ship course 300, paralleling ship	Bowriding
S	C2X	Sep	dolphin	15	DDG	2	200-500	SD	<181-189	4	None	1,333	Dolphins bearing 200, ship course 122, opening ship	Blowing
S	C2X	Sep	dolphin	1	DDG	nr	500-1000	PD	<175-181	3	<169-175	1,000	Dolphin bearing nr, ship course 221, nr	nr
S	JTFEX	Oct	whale	1	CG	1	500-1000	SD	<175-181	15	None	5,000	Whale bearing 085, ship course 110, paralleling ship	Floating
S	C2X	Oct	whale	1	DDG	3	500-1000	PD	<175-181	10	<169-175	3,333	Whale bearing 230, ship course 315, paralleling ship	Sighted one whale breached
S	C2X	Oct	whale	1	DDG	2	500-1000	PD	<175-181	5	<169-175	1,667	Whale bearing 110, ship course 162, paralleling ship	One whale sighted with spout
S	IAC II	Sep	dolphin	100	DDG	5	<200	SD	<189	11	None	3,667	Dolphins bearing 180, ship course 161, opening ship	nr
S	IAC II	Sep	dolphin	10	DDG	1	<200	na	<189	na	<189	na	Dolphins bearing 000, ship course 270, paralleling ship	Bowriding
S	IAC II	Sep	dolphin	5	DDG	5	<200	SD	<189	14	None	4,667	Dolphins bearing 090, ship course 165, nr	nr
S	IAC II	Sep	dolphin	300	DDG	15	200-500	None	<181-189	na	<181-189	na	Dolphins bearing 030, ship course 030, nr	nr
S	IAC II	Sep	pinniped	1	DDG	3	500-1000	PD	<175-181	10	<169-175	3,333	Pinniped bearing 120, ship course 180, opening ship	Sea lion swimming on surface
S	IAC II	Sep	dolphin	20	DDG	3	200-500	SD	<181-189	3	None	1,000	Dolphins bearing 190, ship course 205, opening ship	nr
S	IAC II	Sep	dolphin	20	DDG	2	200-500	SD	<181-189	3	None	1,000	Dolphins bearing 350, ship course 312, opening ship	nr
S	IAC II	Sep	dolphin	2	DDG	1	500-1000	SD	<175-181	8	None	2,667	Dolphins bearing 220, ship course 263, paralleling ship	nr
S	IAC II	Sep	dolphin	12	DDG	1	500-1000	SD	<175-181	1	None	333	Dolphins bearing 310,	nr

													ship course 210, opening ship	
S	IAC II	Sep	dolphin	8	DDG	3	500-1000	SD	<175-181	17	None	5,667	Dolphins bearing 180, ship course 198, paralleling ship	nr
S	IAC II	Jul	whale	1	DDG	2	200-500	SD	<181-189	34	None	11,333	Whale bearing 260, ship course 270, opening ship	Blowing
S	IAC II	Jul	dolphin	40	DDG	1	200-500	PD	<181-189	1	<171-179	333	Dolphins bearing 240, ship course 266, opening ship	nr
S	IAC II	Jul	whale	1	DDG	1	500-1000	SD	<175-181	1	None	333	Whale bearing 345, ship course 349, closing ship	nr
S	IAC II	Jul	whale	1	DDG	1	500-1000	None	<175-181	na	<175-181	na	Whale bearing 270, ship course 270, opening ship	Blowing
S	IAC II	Jul	whale	1	DDG	1	500-1000	PD	<175-181	1	<169-175	333	Whale bearing 090, ship course 281, nr	nr
S	IAC II	Jul	whale	1	DDG	3	200-500	None	<181-189	na	<181-189	na	Whale bearing 168, ship course 211, nr	Blowing

Notes:

¹ Estimated exposure based on 20Log[R] spherical spreading propagation loss for ranges less than 1000 yards and where nominal MFAS Source Level (SL) assumed to be 235 dB for DDGs and 225 for FFGs. 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 $20\log R$ (with "R" being range from the source in yards). Spherical spreading loss in the first 1000 yards equates to 60 dB of loss. At ranges between 1000 and 2000 yards the sound waves can become trapped by the sea surface and bottom (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 2011 and 1 August 2012 are presented in the classified annual exercise report. Sonar use within SOCAL during the reporting period was less than authorized for all sources.

Table S2-i-1. Sonar use 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.

(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. There is currently no method to declassify the sensitivity of this data in order to publish this type of information in an unclassified report. For this reason the only available method for this information to be disseminated for the foreseeable future is in the classified version of this Annual Exercise Report.

(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.

Table S4-1. IEER events and buoys expended, detonated, and self-scuttled.

Event	# Events	# Expended	# Detonated	# Self-scuttled
2 Aug 2011 – 21 Jan 2012	*	*	*	*
22 Jan 2012 – 1 Aug 2012	*	*	*	*
Total Annual	*	*	*	*

*Classified data

(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 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)	0	402	0%
(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		0	
(B) 76 mm naval gunfire rounds		0	
(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		8	
(J) EER/IEER explosive sonobuoys		*	

*classified data

These explosive numbers were collected manually from several different databases that are maintained by separate entities. 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.

HAWAII RANGE COMPLEX

INTRODUCTION

The U.S. Navy prepared this Annual Range Complex Exercise Report covering the period from 2 August 2011 to 1 August 2012 in compliance with the National Marine Fisheries Service (NMFS) Final Rule under the Marine Mammal Protection Act (MMPA) for the 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 2011 to 1 August 2012, and the information represents the best practical data collection for this period. The data collection and reporting timeline differs from the actual LOA dates. In order to provide a better representation of annual exercise data for the HRC, the Navy has combined all exercise data from 2 August 2011 to 1 August 2012 and compared it to the annual allocations provided in the 17 February 2012 HRC Letter of Authorization. This representation of annual exercise data shall be repeated in future Annual Reports. To provide accounting for the entire five year period of the authorization, the Navy will also submit a final report at the end of the five years to provide comprehensive 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 2011 and 1 August 2012. For the HRC, MTEs include Rim of the Pacific exercises (RIMPAC), Undersea Warfare Exercises (USWEX), and Multi Strike Group Exercises.

Between 2 August 2011 and 1 August 2012, there were six MTEs 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
USWEX	8 Aug – 11 Aug	H	#	#	#	#	#	#	#	#	#	1,337	#	#	#	#	#	#	#	4,464	#	#	#	#	#	#	6,4,3
USWEX*	10 Nov – 17 Nov	H	#	#	#	#	#	#	#	#	#	595	#	#	#	#	#	#	#	2,271	#	#	#	#	#	#	9,2,5
USWEX	8 Dec – 10 Dec	H	#	#	#	#	#	#	#	#	#	539	#	#	#	#	#	#	#	2,744	#	#	#	#	#	#	10,2,3
USWEX	14 Dec – 16 Dec	H	#	#	#	#	#	#	#	#	#	521	#	#	#	#	#	#	#	1,962	#	#	#	#	#	#	10,2,3
USWEX*	30 Mar – 9 Apr	H	#	#	#	#	#	#	#	#	#	379	#	#	#	#	#	#	#	4,464	#	#	#	#	#	#	8,2,4
RIMPAC	9 Jul – 1 Aug	H	#	#	#	#	#	#	#	#	#	2,773	#	#	#	#	#	#	#	34,560	#	#	#	#	#	#	8,3,1

USWEX=Undersea Warfare Exercise
H=Hawaii Range Complex

*Koa Kai Exercise
#classified data

(ii) Individual marine mammal sighting information by exercise

Table H1-ii-1. HRC MTE – Individual Marine Mammal Sighting Information: USWEX 8 – 11 Aug 2011.

(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
No marine mammal sightings reported by units during this exercise.													

Table H1-ii-2. HRC MTE – Individual Marine Mammal Sighting Information: USWEX (Koa Kai Exercise) 10 – 17 Nov 2011.

(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	dolphin	3	N	VIS	DDG	5	1	10	N	500-1000	na	na	nr
HRC	dolphin	10	N	VIS	DDG	5	2	10	N	>2000	na	na	nr
HRC	whale	3	N	VIS	FFG	1	2	7	N	500-1000	na	na	nr
HRC	dolphin	2	N	VIS	FFG	2	2	7	N	500-1000	na	na	nr
HRC	dolphin	2	N	VIS	FFG	1	4	7	N	500-1000	na	na	nr
HRC	dolphin	15	N	VIS	DDG	10	1	10	Y	<200	Shut down sonar	Dolphins bearing 010, ship course 040, opening ship	nr
HRC	whale	1	N	VIS	FFG	10	3	10	Y	<200	Shut down sonar	Whale bearing 230, ship course 358, closing ship	nr
HRC	whale	4	N	VIS	FFG	15	3	10	Y	>2000	Shut down sonar	Whales bearing 070, ship course 235, closing ship	nr
HRC	dolphin	10	N	VIS	MPRA	1	5	10	N	>2000	na	na	Swimming

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

Table H1-ii-3. HRC MTE – Individual Marine Mammal Sighting Information: USWEX 8 – 10 Dec 2011.

(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	whale	11	N	VIS	MPRA	1	10	10	N	nr	na	na	Swimming
HRC	whale	1	N	ACO	MPRA	2	8	20	N	na	na	na	Heard aurally while monitoring buoy pattern
HRC	whale	4	N	ACO	MPRA	8	3	10	N	na	na	na	nr

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

Table H1-ii-4. HRC MTE – Individual Marine Mammal Sighting Information: USWEX 14 – 16 Dec 2011.

(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
No marine mammal sightings reported by units during this exercise.													

Table H1-ii-5. HRC MTE – Individual Marine Mammal Sighting Information: USWEX (Koa Kai Exercise) 30 Mar – 9 Apr 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
HRC	whale	1	N	VIS	DDG	3	3	10	N	200-500	na	na	Surfacing
HRC	whale	1	N	VIS	DDG	1	4	10	N	>2000	na	na	Surfacing
HRC	whale	3	N	VIS	FFG	10	6	10	N	500-1000	na	na	nr
HRC	whale	10	N	VIS	DDG	3	4	10	N	>2000	na	na	Slapping/ feeding
HRC	whale	3	Y	VIS	FFG	5	4	10	N	>2000	na	na	nr
HRC	whale	2	N	VIS	FFG	nr	2	10	N	>2000	na	na	nr
HRC	whale	2	N	VIS	FFG	15	2	10	N	1000-2000	na	na	nr
HRC	whale	2	Y	VIS	FFG	10	2	10	N	500-1000	na	na	nr
HRC	whale	8	Y	VIS	FFG	9	4	10	N	200-500	na	na	nr
HRC	whale	2	Y	VIS	FFG	3	4	10	Y	500-1000	Shut down sonar	Whales bearing 165, ship course 175, paralleling ship	nr
HRC	generic	1	N	ACO	FFG	5	4	10	Y	na	na	Mammal bearing nr, ship course 161, nr	nr
HRC	whale	4	N	VIS	FFG	15	4	10	N	>2000	na	na	nr
HRC	whale	1	N	VIS	FFG	5	3	10	Y	500-1000	Powered down sonar	Whale bearing 160, ship course 207, nr	nr
HRC	whale	1	N	VIS	FFG	5	5	10	N	>2000	na	na	nr
HRC	whale	1	N	VIS	DDG	1	1	10	N	>2000	Maneuvered away	na	nr
HRC	whale	2	N	VIS	DDG	5	4	10	N	>2000	na	na	nr
HRC	whale	8	Y	VIS	FFG	30	6	10	N	<200	na	na	nr

HRC	whale	1	N	VIS	DDG	1	4	10	Y	>2000	na	Whale bearing 180, ship course 162, opening ship	Surfacing
HRC	whale	3	N	VIS	DDG	2	2	10	N	500-1000	na	na	Surfacing
HRC	whale	2	Y	VIS	DDG	5	2	10	N	500-1000	na	na	Surfacing
HRC	whale	1	N	VIS	FFG	1	4	6	N	500-1000	na	na	nr
HRC	whale	2	N	VIS	FFG	2	4	6	N	200-500	na	na	nr
HRC	whale	2	N	VIS	FFG	5	4	10	N	200-500	na	na	nr
HRC	whale	1	N	VIS	FFG	10	5	10	Y	500-1000	Powered down sonar	Whale bearing 210, ship course 162, nr	nr

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

Table H1-ii-6. HRC MTE – Individual Marine Mammal Sighting Information: RIMPAC 9 Jul – 1 Aug 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
HRC	dolphin	4	Y	VIS	FFG	10	6	10	N	<200	na	na	Paralleling
HRC	dolphin	4	N	VIS	DDG	50	nr	nr	nr	<200	nr	na	nr
HRC	dolphin	6	N	VIS	FFG	1	8	10	N	<200	na	na	nr
HRC	dolphin	5	N	VIS	CG	3	4	10	N	<200	na	na	Paralleling ship's course
HRC	dolphin	5	N	VIS	CG	5	4	10	N	200-500	na	na	Opening
HRC	whale	1	N	VIS	HELO	7	2	10	N	200-500	Maneuvered away	na	nr
HRC	dolphin	5	N	VIS	HELO	5	2	10	N	<200	na	na	Several dolphins in the water
HRC	whale	10	N	VIS	DDG	5	5	10	N	500-1000	na	na	Opening
HRC	whale	2	N	VIS	CG	8	2	10	N	1000-2000	Maneuvered away	na	Believed to be Cuvier's Beaked Whale heading stbd to port
HRC	whale	50	Y	VIS	FFG	3	10	10	N	<200	na	na	Paralleling
HRC	dolphin	100	N	VIS	HELO	20	5	10	N	<200	Maneuvered away	na	Jumping out of water
HRC	dolphin	25	N	VIS	DDG	10	5	10	N	<200	na	na	Bowriding
HRC	whale	1	N	VIS	CG	3	6	10	N	500-1000	na	na	Believed to be Cuvier's Beaked Whale
HRC	dolphin	8	N	VIS	FFG	15	5	10	Y	<200	Shut down sonar	Dolphins bearing 000, ship course 000, paralleling ship	Swimming
HRC	whale	6	N	VIS	Foreign	nr	nr	10	N	nr	na	na	breaching

HRC	dolphin	1	N	ACO	DDG	15	nr	10	N	na	na	na	nr
HRC	whale	4	N	VIS	Foreign	nr	nr	10	N	nr	na	na	Sperm whale
HRC	whale	5	N	VIS	Foreign	5	3	10	N	>2000	na	na	Melon headed whale cruising on surface, shallow dives
HRC	turtle	1	N	VIS	Foreign	nr	nr	nr	nr	nr	na	na	nr
HRC	dolphin	2	N	VIS	Foreign	3	4	10	N	200-500	na	na	Swimming normally
HRC	dolphin	4	N	VIS	Foreign	3	3	10	N	<200	na	na	Swimming on Surface
HRC	whale	1	N	VIS	Foreign	nr	nr	10	N	500-1000	na	na	Unknown only saw tail
HRC	pinniped	1	N	VIS	na	120	0	10	na	nr	na	na	Hawaiian Monk Seal hauled out on Waikiki beach
HRC	dolphin	1	N	ACO	Foreign	5	5	10	N	na	na	na	Only detected aurally, apparently paralleling ship's course
HRC	whale	12	N	VIS	Non-ASW ship	5	1	10	na	500-1000	Maneuvered away	na	Paralleling ship
HRC	dolphin	20	N	VIS	Foreign	3	5	10	N	<200	na	na	Paralleling ship's course
HRC	whale	4	N	VIS	Foreign	3	2	10	N	1000-2000	na	na	Melon headed Whales floating on Surface, Blowing
HRC	whale	8	N	VIS	Foreign	3	2	10	N	200-500	na	na	Swimming on Surface, Blowing - believed to be Cuvier's Beaked Whales
HRC	dolphin	30	N	VIS	Foreign	nr	nr	nr	N	1000-2000	na	na	Dolphins initially sighted on STBD bow at 1500yards. Pod passed down vessel's STBD beam and last seen STBD quarter at 2000yards.
HRC	dolphin	8	N	VIS	Foreign	3	3	7	N	500-1000	na	na	Breaching
HRC	dolphin	200	N	VIS	Foreign	1	2	10	Y	200-500	Powered down sonar	Dolphins bearing 100, ship course 060, opening ship	Large pod of dolphins sighted on bow
HRC	whale	1	N	VIS	Foreign	3	5	10	N	<200	na	na	Killer Whale paralleling ship's

													course
HRC	generic	1	N	ACO	DDG	39	6	10	Y	na	na	Mammal bearing 105, ship course 060, nr	Marine mammals detected acoustically on listen display
HRC	dolphin	8	N	VIS	Foreign	3	5	8	N	200-500	na	na	nr
HRC	generic	1	N	ACO	DDG	31	nr	10	N	na	na	na	nr

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 six major training exercises conducted in the Hawaii Range Complex this reporting period (2 Aug 2011 to 1 Aug 2012), the Navy conducted over 4,262 hours of Marine Species Awareness Training for over 2,857 Navy personnel prior to beginning the training events. In addition, over the 53 non-consecutive major training event days in this same period (**Table H1-iii-1**), the Navy performed over 50,465 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).

Table H1-iii-1. HRC MTEs from 2 August 2011 to 1 August 2012.

MTE Type	Month	# of Exercise Days	# of Ships Involved (MFAS and non-MFAS)	# of Marine Mammal Sightings	# of Marine Mammals
USWEX	Aug 2011	4	#	0	0
USWEX*	Nov 2011	8	#	9	50
USWEX	Dec 2011	3	#	3	16
USWEX	Dec 2011	3	#	0	0
USWEX*	Mar – Apr 2012	11	#	24	64
RIMPAC	Jul – Aug 2012	24	#	35	545
Totals:		53	#	71	675

*Koa Kai Exercise
#classified data

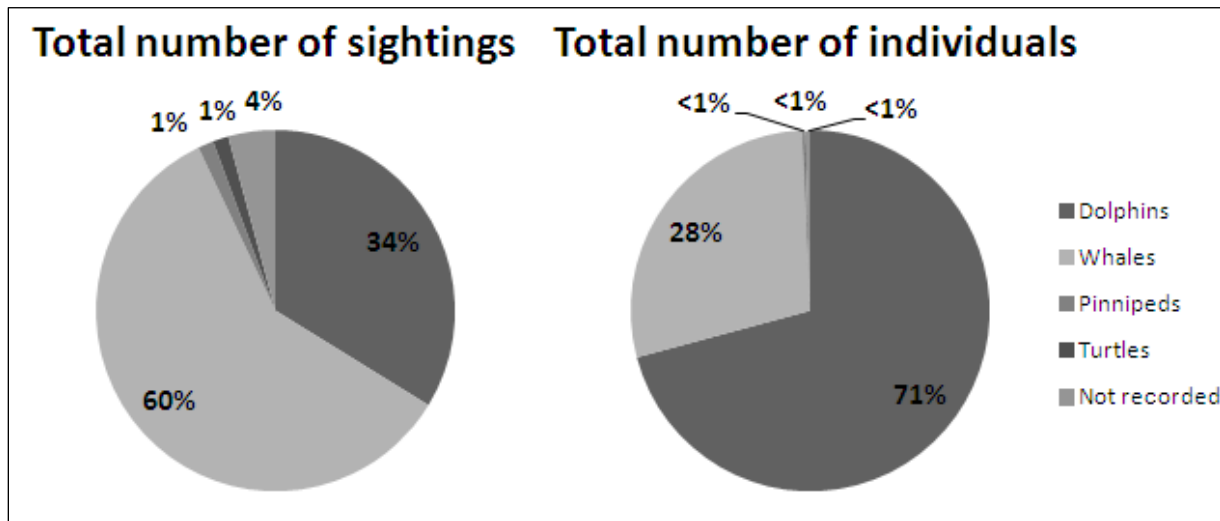
Hawaii Range Complex Major Training Exercise Marine Mammal Observations

There were approximately 71 sightings of an estimated 675 marine mammals over the course of the six major training exercises 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 2011 to 1 August 2012.

Species Type	# of Sightings	% of Total Sightings	# of Marine Mammals	% of Total Number of Marine Mammals
Dolphins	24	34%	478	71%
Whales	42	60%	192	28%
Pinnipeds	1	1%	1	<1%
Turtles	1	1%	1	<1%
Not recorded	3	4%	3	<1%
Totals:	71		675	

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 2011 to 1 August 2012.



Hawaii Range Complex Major Training Event Mitigations

From **Table H1-iii-2**, of the 71 Navy marine mammal sightings during major training exercises this reporting period, there were 3 sightings within 200 yards that qualified as mitigation events. In other words, mid-frequency active sonar units had their sonar on, and followed the appropriate mitigation (power down) depending on the range to the marine mammal (**Table H1-iii-3**).

There were also 5 instances of Navy ships actively maneuvering to avoid marine mammals. Of these 4 maneuvers, 2 were to avoid 1 whale each, 1 was to avoid 2 whales, 1 was to avoid 12 whales, and the last was to avoid 100 dolphins.

Table H1-iii-3. Number of marine mammal sightings at ranges less than 200 yards observed from Navy platforms during major training exercises concurrent with sonar shutdown mitigation 2 August 2011 to 1 August 2012.

Shutdown Mitigation Range	Total # of Sightings	Total # of Marine Mammals	Breakdown by species type			
			# of Whales	# of Dolphins	# of Pinnipeds	# of Not Reported
< 200 yards	3	24	1 times for 1 whale	2 times for 23 dolphins	0	0

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 1µPa) ¹	11) Number of minutes sonar mitigation applied	12) Estimate exposure AFTER mitigation (dB re 1µPa) ¹	13) DISTANCE ship would have moved given length of mitigation and nominal 10-knot ship speed (yds)	(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	Nov	dolphin	15	DDG	10	<200	SD	<189	25	None	8,333	Dolphins bearing 010, ship course 040, opening ship	nr
H	USWEX	Nov	whale	1	FFG	10	<200	SD	<179	15	None	5,000	Whale bearing 230, ship course 358, closing ship	nr
H	USWEX	Apr	whale	2	FFG	3	500-1000	SD	<165-171	10	None	3,333	Whales bearing 165, ship course 175, paralleling ship	nr
H	USWEX	Apr	whale	1	FFG	5	500-1000	PD	<165-171	16	<159-165	5,333	Whale bearing 160, ship course 207, nr	nr
H	USWEX	Apr	whale	1	FFG	10	500-1000	PD	<165-171	10	<159-165	3,333	Whale bearing 210, ship course 162, nr	nr
H	RIMPAC	Jul	dolphin	8	FFG	15	<200	SD	<179	60	None	20,000	Dolphins bearing 000, ship course 000, paralleling ship	Swimming
H	RIMPAC	Jul	dolphin	200	Foreign	1	200-500	PD	<171-179	60	<161-169	20,000	Dolphins bearing 100, ship course 060, opening ship	Large pod of dolphins sighted off the bow

Notes:
¹Estimated 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 $20\log R$ (with "R" being range from the source in yards). Spherical spreading loss in the first 1000 yards equates to 60 dB of loss. At ranges between 1000 and 2000 yards the sound waves can become trapped by the sea surface and bottom (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 2011 and 1 August 2012 are presented in the classified annual exercise report. Sonar use within the HRC during the reporting period was less than authorized for all sources.

Table H2-i-1. Sonar use authorized per year 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)

Hull-mounted MFAS use was not reported within the dense humpback areas plus a 5 km buffer between 15 December 2011 and 15 April 2012. The precise boundaries of these “dense humpback areas” have yet to be formalized by the U.S. Navy and NMFS.

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

Hull-mounted MFAS use was not reported within the Humpback Whale Cautionary Area between 15 December 2011 and 15 April 2012.

(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 MFAS was not used within the boundaries of the “dense humpback areas” or the “Humpback Whale Cautionary Area” between 15 December 2011 and 15 April 2012.

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

(3) HRC – SINKEX

(i) Exercise information

Based on the reporting requirements in the HRC Final Rule the below information on Sinking Exercises is submitted for events between 2 August 2011 and 1 August 2012. Three SINKEXs were conducted in the HRC between 2 August 2011 and 1 August 2012, one each on 14 July, 17 July, and from 20 to 22 July 2012.

Specific reporting requirements include:

- (i) Exercise information (for each SINKEX)
- (ii) Individual marine mammal observations.

HRC SINKEX data for the reporting period is summarized in the classified annual exercise report.

Table H3-i-1. Summary of SINKEXs conducted in HRC.

(a) Location	(b) Date/time exercise began/ended	(c) Total hours of observation before, during, and after exercise	(d) Total number and types of rounds expended/explosives detonated	(e) Number and types of passive acoustic sources used in exercise	(f) Total hours of passive acoustic search time	(g) Number and types of vessels and aircraft participating	(h) Wave height in ft (High, Low, Avg)	(i) Narrative description of sensors and platforms used for marine mammal detection and timeline illustrating how marine mammal detection was conducted
23:01.2N – 160:01.7W	141800ZJUL12 to 142131ZJUL12	14	*	None, ships were outside of passive detection ranges	0	*	4, 3, 3	Marine mammal surveillance began 2 hours prior to COMEX using C-26 and S-61 aircraft from PMRF. In addition, 2 P-3 aircraft provided a total of 6.5 hours of range clearance, commencing 1 hour prior to COMEX. Aerial surveillance continued throughout the event and for 2 hours after FINEX by participants and range platforms.
22:53.8N – 160:08.7W	171930ZJUL12 to 180212ZJUL12	26	*	1 SQS-53 sonar 8 SSQ-53 sonobuoys	4	*	3, 2, 2	Marine mammal surveillance began 2 hours prior to COMEX using C-26 and S-61 aircraft from PMRF. 3 P-3 aircraft provided more than 10 hours of range clearance, commencing 1 hour prior to COMEX. A P-3 laid a pattern of passive buoys around the hulk. Aerial surveillance continued throughout the event and for 2 hours after FINEX by participants and range platforms.
23:02.1N – 159:51.6W	221600ZJUL12 to 222145ZJUL12	39	*	8 SSQ-53 sonobuoys	3	*	5, 3, 4	This SINKEX actually occurred over a three day period, from 20-22 July due to various range issues, but the only ordnance launched occurred on the 20th and 22nd. Marine mammal surveillance began 2 hours prior to COMEX each day, using C-26 and S-61 aircraft from PMRF. In addition, P-3 aircraft provided more than 15 hours of range clearance, commencing at least 1 hour prior to COMEX each day. A P-3 laid a pattern of passive buoys around the hulk. Aerial surveillance continued throughout the event and for 2 hours after FINEX by participants and range platforms.

(ii) Individual marine mammal observation information

Table H3-ii-1. Mammal sighting information for SINKEX on 14 July 2012.

(a) Location	(b) Species	(c) Number of individuals	(d) Calves observed (y/n)	(e) Initial detection sensor	(f) Length of observation (min)	(g) Wave height	(h) Visibility	(i) Sighted before/during/after exercise, and time (min)	(j) Distance of mammal from detonation	(k) Observed behavior	(l) Mitigation implementation	(m) If observation occurs during detonation, indicate munitions type
No marine mammal sightings reported during this event.												

Table H3-ii-2. Mammal sighting information for SINKEX on 17 July 2012.

(a) Location	(b) Species	(c) Number of individuals	(d) Calves observed (y/n)	(e) Initial detection sensor	(f) Length of observation (min)	(g) Wave height	(h) Visibility	(i) Sighted before/during/after exercise, and time (min)	(j) Distance of mammal from detonation	(k) Observed behavior	(l) Mitigation implementation	(m) If observation occurs during detonation, indicate munitions type
No marine mammal sightings reported during this event.												

Table H3-ii-3. Mammal sighting information for SINKEX on 20 – 22 July 2012.

(a) Location	(b) Species	(c) Number of individuals	(d) Calves observed (y/n)	(e) Initial detection sensor	(f) Length of observation (min)	(g) Wave height	(h) Visibility	(i) Sighted before/during/after exercise, and time (min)	(j) Distance of mammal from detonation	(k) Observed behavior	(l) Mitigation implementation	(m) If observation occurs during detonation, indicate munitions type
No marine mammal sightings reported during this event.												

(4) HRC – IEER/AEER Summary

The annual summary of use within the HRC for Improved Extended Echo Ranging (IEER) and Advanced Extended 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).

Table H4-1. IEER/AEER events and buoys expended, detonated, and self-scuttled.

Event	# Events	# Expended	# Detonated	# Self-scuttled
2 Aug 2011 – 14 Jan 2012	*	*	*	*
15 Jan 2012 – 1 Aug 2012	*	*	*	*
Total Annual	*	*	*	*

*classified data

(5) HRC – 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 Hawaii Range Complex Final Rule. These explosive numbers were collected manually from several different databases that are maintained by the separate entities. 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 within the Hawaiian 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.

Authorized Exercise §216.170(c)(2)(ii)	Total Annual	Amount Annually Authorized	% Total Used To Total Authorized
(A) Mine Neutralization	11	68	16%
(B) Air-to-Surface Missile Exercise (A-S MISSILEX)	15	50	30%
(C) Surface-to-Surface Missile Exercise (S-S MISSILEX)	2	12	17%
(D) Bombing Exercise (BOMBEX)	5	38	13%
(E) Sinking Exercise (SINKEX)	3	6	50%
(F) Surface-to-Surface Gunnery Exercise (S-S GUNEX)	84	91	92%
(G) Naval Surface Fire Support (NSFS)	5	28	18%
(H) EER/IEER explosive sonobuoys	*	4	*

*classified data

(ii) Total annual expended/detonated rounds for each explosive type**Table H5-ii-1. Explosives usage in the HRC.**

Underwater Explosives §216.170 (c)(2)(i)	Number
(A) 5" naval gunfire rounds	656
(B) 76 mm naval gunfire rounds	139
(C) Maverick missiles	7
(D) Harpoon missiles	7
(E) Mk-82 aerial bombs	19
(F) Mk-83 aerial bombs	0
(G) Mk-84 aerial bombs	0
(H) Mk-48 torpedoes (detonations)	5
(I) Demolition charges	24
(J) EER/IEER sonobuoys	*

*classified data