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

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UNCLASSIFIED
Annual Exercise Report
With 5-Year Close-out Report

26 December 2017 to 20 December 2018
Year 5

For The U.S. Navy's
Hawaii-Southern California Training and Testing (HSTT)
Study Area

25 March 2019

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ANNUAL HAWAII-SOUTHERN CALIFORNIA TRAINING AND TESTING EXERCISE REPORT

INTRODUCTION

The U.S. Navy prepared this unclassified Annual Exercise Report covering the period from 26 December 2017 to 20 December 2018. In compliance with the National Marine Fisheries Service (NMFS) Final Rule under the Marine Mammal Protection Act (MMPA) for the Hawaii-Southern California Training and Testing (HSTT) Study Area a classified version of this report is also submitted to NMFS.

In the HSTT Study Area Letter of Authorization¹ requirements for “Monitoring and Reporting”, the following report subsections were specified. However, only unclassified information is present within this report:

- (1) Major Training Exercises (MTE)/SINKEX
 - (i) Reporting requirements for Coordinated and Strike Group Exercises and SINKEX
 - (ii) Exercise information for each MTE
 - (iii) Exercise information for each SINKEX
- (2) Summary of Sources Used
 - (i) Total annual usage of each type of sound source
- (3) Sonar Exercise Notification
- (4) Geographic Information Presentation
- (5) Special Reporting Requirements
 - (i) Total hours (from 15 December through 15 April) of hull-mounted active sonar operation occurring in the dense humpback areas generally shown on the Mobley map plus a 5-km buffer, but not including the Pacific Missile Range Facility
 - (ii) Total estimated annual hours of hull-mounted active sonar operation conducted in the Humpback Whale Cautionary Area between 15 December and 15 April
- (6) 5-Year Close-out Report

The information in this Annual Report represents the best practical data collection for this period. The 5-Year Close-out Report contains final totals of authorized usage for the entire five-year period of the authorization.

¹HSTT: 7(d) of the Training Letter of Authorization, and 50 CFR §218.75(f)(1) through (f)(5)

(1) HSTT – Major Training Exercises/SINKEX

(i) Reporting requirements for Coordinated and Strike Group Major Training Exercises and SINKEX

The HSTT Study Area Letter of Authorization requires reporting for MTEs and Sinking Exercises (SINKEX) taking place during the reporting period. MTEs that occur in HSTT include *Sustainment Exercises* (SUSTEX), *Integrated ASW Courses* (IAC), *Composite Training Unit Exercises* (C2X), *Joint Task Force Exercises* (JTFEX), *Undersea Warfare Exercises* (USWEX), and *Rim of the Pacific Exercises* (RIMPAC)¹.

(ii) Exercise information for each Major Training Exercise

Major training exercise sonar usage and participants are classified and were forwarded to NMFS in the classified version of this report.

Table 1-ii-1. MTEs conducted in the HSTT Study Area.

(A) Exercise designator	(B) Date	(C) Location	(D) Number of items or hours of each sound source bin used						(E) Number and types of US vessels and aircraft participating								
			MF1 (hours)	MF2 (hours)	MF3 (hours)	MF4 (hours)	MF5 (buoys)	ASW3 (hours)	CG	DDG	FFG	MH-60R/SH-60F dipping helo	SH-60B non-dipping helo	Submarines	MRA	Non-ASW surface ship	
USWEX	16 Jan – 17 Jan 2018	HRC	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C2X	30 May – 15 Jun 2018	SOCAL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IAC	5 Jun – 8 Jun 2018	SOCAL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
RIMPAC	9 Jul – 2 Aug 2018	SOCAL/HRC	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
C2X	7 Aug – 8 Sep 2018	SOCAL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IAC	8 Aug – 16 Aug 2018	SOCAL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
USWEX	23 Oct – 1 Nov 2018	SOCAL/HRC	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

¹RIMPAC is not listed as one of the Major Training Exercises requiring reporting in the HSTT Final Rule, or the HSTT MMPA Letter of Authorization for training, but is listed in the sonar exercise notification section.

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

(F) Individual marine mammal sighting information by exercise
 Table 1-ii-2. HSTT MTE – Individual Marine Mammal Sighting Information: USWEX 16 Jan – 17 Jan 2018.

Date/time/location of sighting	Species	Number of individuals	Initial detection sensor	Indication of specific type of platform the observation was made from	Length of time observers maintained visual contact with marine mammals (min)	Sea state (Beaufort scale)	Visibility (nm)	Sound source in use at time of sighting (Y/N)	Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000yd from sound source	Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was; or whether navigation was changed or delayed	If source in use is a hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s), and if any calves are present
17-Jan-18	dolphin	30	VIS	Non-ASW ship	5	2	10	na	200-500	None	Closing	nr
18-Jan-18	whale	2	VIS	Non-ASW ship	2	2	10	na	501-1000	None	Paralleling	nr

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

Table 1-ii-3. HSTT MTE – Individual Marine Mammal Sighting Information: C2X 30 May – 15 Jun 2018.

Date/time/location of sighting	Species	Number of individuals	Initial detection sensor	Indication of specific type of platform the observation was made from	Length of time observers maintained visual contact with marine mammal(s) (min)	Sea state (Beaufort scale)	Visibility (nm)	Sound source in use at time of sighting (Y/N)	Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000yd from sound source	Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was; or whether navigation was changed or delayed	If source in use is a hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s), and if any calves are present
No marine mammal sightings reported during this exercise.												

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

Table 1-ii-4. HSTT MTE – Individual Marine Mammal Sighting Information: IAC 5 Jun – 8 Jun 2018.

Date/time/location of sighting	Species	Number of individuals	Initial detection sensor	Indication of specific type of platform the observation was made from	Length of time observers maintained visual contact with marine mammal(s) (min)	Sea state (Beaufort scale)	Visibility (m)	Sound source in use at time of sighting (Y/N)	Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000yd from sound source	Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was; or whether navigation was changed or delayed	If source in use is a hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s), and if any calves are present

No marine mammal sightings reported during this exercise.

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

Table 1-ii-5. HSTT MTE – Individual Marine Mammal Sighting Information: RIMPAC 9 Jul – 2 Aug 2018.

Date/time/location of sighting	Species	Number of individuals	Initial detection sensor	Indication of specific type of platform the observation was made from	Length of time observers maintained visual contact with marine mammal(s) (min)	Sea state (Beaufort scale)	Visibility (m)	Sound source in use at time of sighting (Y/N)	Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000yd from sound source	Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was; or whether navigation was changed or delayed	If source in use is a hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s), and if any calves are present
9-Jul-18	dolphin	1	VIS	Small craft	3	1	5	na	<200	Maneuvered away	na	Diving
10-Jul-18	dolphin	8	VIS	Non-ASW ship	7	2	8	na	501-1000	None	na	Jumping on surface
10-Jul-18	pinniped	3	VIS	Non-ASW ship	4	2	8	na	501-1000	None	na	Floating
10-Jul-18	whale	2	VIS	Foreign participant	1	2	10	na	501-1000	None	na	Blowing
10-Jul-18	dolphin	50	VIS	Non-ASW ship	2	1	10	na	501-1000	None	na	Jumping
10-Jul-18	dolphin	3	VIS	Non-ASW ship	2	3	10	na	>2000	Maneuvered away	na	Diving/Surfacing
11-Jul-18	dolphin	1	VIS	Small craft	1	1	3	na	<200	Maneuvered away	na	Diving
11-Jul-18	dolphin	1	VIS	Small craft	1	1	3	na	<200	Maneuvered away	na	Diving
11-Jul-18	dolphin	1	VIS	Small craft	1	1	3	na	<200	Maneuvered away	na	Diving
11-Jul-18	whale	1	VIS	Non-ASW ship	4	2	10	na	<200	None	na	Blowing
11-Jul-18	pinniped	2	VIS	Non-ASW ship	4	2	8	na	200-500	None	na	Floating on surface
11-Jul-18	pinniped	1	VIS	Non-ASW ship	1	0	7	na	200-500	None	na	Floating on surface to diving
11-Jul-18	dolphin	2	VIS	Non-ASW ship	2	0	7	na	200-500	None	na	Floating on surface
11-Jul-18	whale	1	VIS	Non-ASW ship	3	2	10	na	200-500	None	na	Blowing
11-Jul-18	dolphin	100	VIS	Non-ASW ship	2	1	10	na	200-500	None	na	Jumping
11-Jul-18	dolphin	3	VIS	Non-ASW ship	1	2	8	na	501-1000	None	na	Jumping

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11-Jul-18	2132Z	SOCAL	dolphin	3	VIS	Non-ASW ship	1	2	8	na	501-1000	None	na	Jumping
11-Jul-18	2330Z	SOCAL	dolphin	10	VIS	Helo	1	1	10	N	501-1000	None	na	Blowing
11-Jul-18	2245Z	SOCAL	dolphin	75	VIS	Non-ASW ship	7	1	10	na	>2000	None	na	Jumping
11-Jul-18	1920Z	HRC	pinniped	1	VIS	Foreign participant	60	0	10	na	nr	None	na	Summing itself on the beach
12-Jul-18	0325Z	SOCAL	dolphin	10	VIS	Non-ASW ship	5	1	10	na	200-500	Maneuvered away	na	Jumping
12-Jul-18	0055Z	SOCAL	whale	1	VIS	Non-ASW ship	5	1	10	na	501-1000	None	na	Blowing
12-Jul-18	2137Z	SOCAL	dolphin	6	VIS	Non-ASW ship	1	0	7	na	1001-2000	None	na	Jumping
12-Jul-18	2115Z	SOCAL	dolphin	20	VIS	Non-ASW ship	5	1	7	na	1001-2000	None	na	Jumping
12-Jul-18	1940Z	SOCAL	dolphin	4	VIS	Non-ASW ship	2	1	7	na	1001-2000	None	na	Jumping
12-Jul-18	2056Z	SOCAL	dolphin	4	VIS	Non-ASW ship	1	0	7	na	1001-2000	None	na	Jumping
15-Jul-18	1739Z	SOCAL	dolphin	20	VIS	Non-ASW ship	4	2	9	na	200-500	None	na	Bow riding
16-Jul-18	0030Z	HRC	dolphin	1	VIS	Non-ASW ship	1	3	10	na	<200	None	na	Jumping
16-Jul-18	2220Z	HRC	dolphin	10	VIS	Small craft	60	1	10	na	<200	Canceled UNDET exercise	na	Swimming
16-Jul-18	1600Z	SOCAL	dolphin	2	VIS	Helo	1	1	4	Y	200-500	None	na	Passed behind
16-Jul-18	2330Z	SOCAL	dolphin	6	VIS	Helo	1	1	10	Y	200-500	None	na	Passed behind, blowing
16-Jul-18	0123Z	HRC	generic	1	VIS	DDG	3	2	10	N	>2000	None	na	Passing
17-Jul-18	2215Z	SOCAL	whale	2	VIS	Non-ASW ship	1	2	10	na	<200	Maneuvered away	na	Swimming
17-Jul-18	1638Z	SOCAL	whale	1	VIS	Non-ASW ship	2	3	10	na	200-500	Maneuvered away	na	Blowing
18-Jul-18	0120Z	SOCAL	whale	3	VIS	Non-ASW ship	20	1	10	na	200-500	Maneuvered away	na	Blowing
18-Jul-18	1600Z	SOCAL	dolphin	20	VIS	Helo	2	1	10	Y	501-1000	None	na	Passed behind, blowing
18-Jul-18	0105Z	SOCAL	whale	1	VIS	Non-ASW ship	5	1	10	na	1001-2000	None	na	Blowing
18-Jul-18	0230Z	SOCAL	whale	3	VIS	Non-ASW ship	5	1	10	na	1001-2000	None	na	Blowing
19-Jul-18	1700Z	SOCAL	dolphin	4	VIS	Helo	1	1	10	N	<200	None	na	Splashed around in rotor wash
19-Jul-18	2040Z	SOCAL	whale	1	VIS	Helo	1	1	10	N	200-500	None	na	Blowing
19-Jul-18	1212Z	SOCAL	whale	1	VIS	Non-ASW ship	5	1	10	na	501-1000	None	na	Blowing
19-Jul-18	2056Z	SOCAL	pinniped	4	VIS	Helo	2	1	10	N	501-1000	None	na	On channel buoy

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20-Jul-18	1532Z	SOCAL	dolphin	25	VIS	Non-ASW ship	5	1	10	na	200-500	None	na	Jumping
20-Jul-18	1731Z	SOCAL	pinniped	2	VIS	Non-ASW ship	4	2	7	na	200-500	None	na	On Red Buoy #6
20-Jul-18	0507Z	HRC	whale	5	VIS	Foreign participant	30	2	7	na	>2000	None	na	Swimming
21-Jul-18	1436Z	SOCAL	dolphin	13	VIS	Non-ASW ship	5	2	7	na	1001-2000	None	na	Jumping
22-Jul-18	2311Z	SOCAL	pinniped	1	VIS	Non-ASW ship	2	1	10	na	<200	None	na	Swimming
22-Jul-18	2356Z	SOCAL	pinniped	1	VIS	Non-ASW ship	3	1	10	na	<200	None	na	Swimming
22-Jul-18	0123Z	SOCAL	dolphin	1	VIS	Small craft	1	1	3	na	<200	Maneuvered away	na	Diving
22-Jul-18	1620Z	SOCAL	dolphin	20	VIS	Helio	1	2	10	N	200-500	None	na	Diving/Swimming
22-Jul-18	1903Z	SOCAL	pinniped	1	VIS	Non-ASW ship	1	1	7	na	1001-2000	None	na	Jumping
23-Jul-18	1815Z	SOCAL	pinniped	2	VIS	Foreign participant	10	1	10	na	<200	None	na	Eating
23-Jul-18	1410Z	SOCAL	whale	2	VIS	Non-ASW ship	6	1	10	na	200-500	Maneuvered away	na	Blowing
23-Jul-18	1459Z	SOCAL	dolphin	50	VIS	Non-ASW ship	3	1	10	na	200-500	None	na	Bow riding
23-Jul-18	1413Z	SOCAL	dolphin	3	VIS	Non-ASW ship	2	1	7	na	501-1000	None	na	Jumping
23-Jul-18	1546Z	SOCAL	dolphin	11	VIS	Non-ASW ship	1	1	7	na	501-1000	None	na	Jumping
23-Jul-18	2300Z	SOCAL	dolphin	8	VIS	Non-ASW ship	2	1	7	na	1001-2000	None	na	Jumping
24-Jul-18	0322Z	SOCAL	dolphin	100	VIS	Foreign participant	6	2	10	na	200-500	None	na	Swimming
24-Jul-18	0250Z	HRC	dolphin	10	ACO	Foreign participant	3	1	6	Y	200-500	Sonar shutdown	Dolphins bearing 330R, closing ship	Closed then opened
25-Jul-18	1745Z	SOCAL	pinniped	2	VIS	Foreign participant	4	1	6	N	200-500	None	na	Floating on buoy
25-Jul-18	2001Z	SOCAL	dolphin	15	VIS	Foreign participant	2	1	7	N	200-500	None	na	Diving
25-Jul-18	1926Z	SOCAL	dolphin	200	VIS	Foreign participant	16	1	7	N	501-1000	None	na	Diving
26-Jul-18	1735Z	HRC	dolphin	3	VIS	Foreign participant	2	2	10	N	<200	None	na	Bow riding
26-Jul-18	1008Z	HRC	dolphin	4	VIS	Non-ASW ship	6	5	10	na	501-1000	None	na	Swimming

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

Table 1-ii-6. HSTT MTE – Individual Marine Mammal Sighting Information: C2X 7 Aug – 8 Sep 2018.

Date/time/location of sighting	Species	Number of individuals	Initial detection sensor	Indication of specific type of platform the observation was made from	Length of time observers maintained visual contact with marine mammal(s) (min)	Sea state (Beaufort scale)	Visibility (m)	Sound source in use at time of sighting (Y/N)	Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000yd from sound source	Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was; or whether navigation was changed or delayed	If source in use is a hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s), and if any calves are present
7-Aug-18	dolphin	20	VIS	Non-ASW ship	2	2	5	na	<200	None	na	Breaching
7-Aug-18	dolphin	15	VIS	Non-ASW ship	nr	nr	10	na	200-500	None	na	Normal
7-Aug-18	dolphin	10	VIS	Non-ASW ship	2	2	10	na	200-500	None	na	Breaching
7-Aug-18	dolphin	30	VIS	Non-ASW ship	2	1	10	na	>2000	None	na	Moving
18-Aug-18	dolphin	5	VIS	DDG	2	1	10	N	<200	None	na	Floating on surface
18-Aug-18	dolphin	20	VIS	Non-ASW ship	2	2	5	na	200-500	None	na	Breaching
21-Aug-18	dolphin	30	VIS	DDG	2	1	10	N	501-1000	Maneuvered away	na	Swimming on surface
25-Aug-18	whale	2	VIS	DDG	5	1	7	N	501-1000	Maneuvered away	na	Blowing
26-Aug-18	whale	1	VIS	DDG	2	1	10	N	501-1000	None	na	Paralleling ship
26-Aug-18	whale	1	VIS	Non-ASW ship	3	2	6	na	>2000	None	na	Swimming
27-Aug-18	whale	1	VIS	CG	2	2	10	Y	501-1000	None	Whale bearing 270R, paralleling ship	Blowing

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

Table 1-ii-7. HSTT MTE – Individual Marine Mammal Sighting Information: IAC 8 Aug – 16 Aug 2018.

Date/time/location of sighting	Species	Number of individuals	Initial detection sensor	Indication of specific type of platform the observation was made from	Length of time observers maintained visual contact with marine mammal(s) (min)	Sea state (Beaufort scale)	Visibility (m)	Sound source in use at time of sighting (Y/N)	Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000yd from sound source	Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was; or whether navigation was changed or delayed	If source in use is a hull-mounted sonar, relative bearing of animal's motion relative to ship	Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s), and if any calves are present
8-Aug-18	whale	2	VIS	DDG	1	2	10	N	200-500	None	na	Swimming
8-Aug-18	whale	1	VIS	Non-ASW ship	1	1	9	na	200-500	None	na	Swimming
9-Aug-18	dolphin	40	VIS	DDG	10	1	10	N	1001-2000	None	na	Swimming
9-Aug-18	dolphin	20	VIS	DDG	10	2	10	N	>2000	None	na	Swimming
10-Aug-18	whale	2	VIS	Non-ASW ship	1	1	10	na	200-500	None	na	Normal
10-Aug-18	whale	2	VIS	Non-ASW ship	1	1	10	na	200-500	None	na	Normal
10-Aug-18	dolphin	100	VIS	DDG	2	1	8	Y	200-500	None	Dolphins bearing 070R, closing ship	Swimming on surface
10-Aug-18	dolphin	1	VIS	Non-ASW ship	5	2	10	na	501-1000	None	na	nr
10-Aug-18	dolphin	35	VIS	Non-ASW ship	10	1	10	na	501-1000	None	na	nr
10-Aug-18	dolphin	20	VIS	Non-ASW ship	3	1	10	na	1001-2000	None	na	nr
10-Aug-18	whale	1	VIS	Non-ASW ship	2	1	10	na	1001-2000	None	na	Normal
10-Aug-18	whale	3	VIS	DDG	1	1	8	Y	>2000	Maneuvered away	Whales bearing 130R, closing ship	Closing
10-Aug-18	whale	1	VIS	Non-ASW ship	3	1	10	na	>2000	None	na	Sounded
10-Aug-18	dolphin	30	VIS	Non-ASW ship	1	1	10	na	>2000	None	na	Swimming
10-Aug-18	whale	1	VIS	Non-ASW ship	nr	1	10	na	>2000	None	na	Normal
10-Aug-18	whale	1	VIS	Non-ASW ship	1	1	10	na	>2000	None	na	Normal

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10-Aug-18	2115Z	SOCAL	whale	1	VIS	Non-ASW ship	1	1	10	na	>2000	None	na	Normal
10-Aug-18	0900Z	SOCAL	whale	1	VIS	DDG	5	2	7	N	nr	Maneuvered away	na	Swimming
11-Aug-18	0051Z	SOCAL	whale	1	VIS	Non-ASW ship	2	2	10	na	1001-2000	None	na	Swimming
11-Aug-18	0054Z	SOCAL	whale	1	VIS	Non-ASW ship	1	2	10	na	>2000	None	na	Blowing
11-Aug-18	2135Z	SOCAL	generic	1	VIS	Non-ASW ship	2	2	10	na	>2000	None	na	Surfaced swimming
11-Aug-18	0054Z	SOCAL	whale	1	VIS	Non-ASW ship	1	2	10	na	>2000	None	na	Swimming
11-Aug-18	1334Z	SOCAL	dolphin	1	nr	nr	nr	nr	nr	nr	nr	Shutdown sonar	na	nr
11-Aug-18	1402Z	SOCAL	dolphin	1	nr	nr	nr	nr	nr	nr	nr	Shutdown sonar	na	nr
11-Aug-18	1500Z	SOCAL	dolphin	50	nr	Helo	nr	nr	nr	nr	<200	Delayed sonar	na	nr
12-Aug-18	1255Z	SOCAL	dolphin	5	VIS	DDG	2	1	7	N	200-500	None	na	Paralleling ship
12-Aug-18	1709Z	SOCAL	whale	1	VIS	Non-ASW ship	2	2	5	na	501-1000	None	na	Blowing
12-Aug-18	1722Z	SOCAL	whale	2	VIS	DDG	4	2	10	N	1001-2000	Maneuvered away	na	Blowing
12-Aug-18	2035Z	SOCAL	whale	1	VIS	DDG	2	1	10	N	1001-2000	Maneuvered away	na	Swimming near surface briefly
12-Aug-18	2033Z	SOCAL	whale	1	VIS	Non-ASW ship	2	1	10	na	>2000	None	na	Blowing
13-Aug-18	0014Z	SOCAL	whale	1	VIS	DDG	2	2	10	N	>2000	Maneuvered away	na	Splashing
13-Aug-18	0000Z	SOCAL	whale	3	VIS	Non-ASW ship	1	1	10	na	>2000	None	na	Regular
14-Aug-18	0215Z	SOCAL	whale	1	VIS	Non-ASW ship	1	1	10	na	<200	Maneuvered away	na	Breached water surface
14-Aug-18	1630Z	SOCAL	whale	1	VIS	DDG	2	1	10	Y	200-500	Shutdown sonar, maneuvered away	Whale bearing 045R, opening ship	Swimming near surface
14-Aug-18	1453Z	SOCAL	dolphin	12	nr	nr	nr	nr	nr	nr	nr	Shutdown sonar	na	nr
15-Aug-18	0230Z	SOCAL	whale	1	VIS	Non-ASW ship	3	nr	3	na	>2000	None	na	Blowing

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

Table 1-ii-8. HSTT MTE – Individual Marine Mammal Sighting Information: USWEX 23 Oct – 1 Nov 2018.

Date/time/location of sighting	Species	Number of individuals	Initial detection sensor	Indication of specific type of platform the observation was made from	Length of time observers maintained visual contact with marine mammal(s) (min)	Sea state (Beaufort scale)	Visibility (nm)	Sound source in use at time of sighting (Y/N)	Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000yd from sound source	Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered down or shutdown, and how long the delay was; or whether navigation was changed or delayed	If source in use is a hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	Observed behavior – Watchstanders shall report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s), and if any calves are present
22-Oct-18	dolphin	10	VIS	DDG	1	1	7	N	<200	None	na	Swimming
23-Oct-18	whale	1	VIS	DDG	2	1	10	N	>2000	None	na	Swimming
23-Oct-18	whale	1	VIS	Non-ASW ship	1	2	10	na	200-500	None	na	Blowing
23-Oct-18	whale	1	VIS	Non-ASW ship	5	2	10	na	501-1000	None	na	Blowing
23-Oct-18	whale	1	VIS	Non-ASW ship	1	0	10	na	501-1000	None	na	Blowing
23-Oct-18	whale	3	VIS	Non-ASW ship	1	2	nr	na	>2000	None	na	Blowing
23-Oct-18	dolphin	50	VIS	Non-ASW ship	10	0	10	na	<200	None	na	Traveling
23-Oct-18	whale	3	VIS	DDG	1	1	7	N	501-1000	None	na	Swimming
24-Oct-18	dolphin	23	VIS	Non-ASW ship	5	3	10	na	501-1000	None	na	Playing/riding waves

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

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

There were seven major training exercises conducted in the HSTT Study Area during this reporting period (see **Table 1-ii-9**). In support of these MTEs, the Navy conducted over 4,210 hours of Marine Species Awareness Training for 5,621 personnel prior to the beginning of these training exercises.

Table 1-ii-9. HSTT Study Area Major Training Exercises.

MTE Type	Dates	# of Exercise Days	# of US Ships Involved (MFAS and non-MFAS)	# of Marine Mammal Sightings	# of Marine Mammals
USWEX	16 Jan – 17 Jan 2018	2	*	2	32
C2X	30 May – 15 Jun 2018	16	*	0	0
IAC	5 Jun – 8 Jun 2018	4	*	0	0
RIMPAC	9 Jul – 2 Aug 2018	25	*	64	873
C2X	7 Aug – 8 Sep 2018	30	*	11	135
IAC	8 Aug – 16 Aug 2018	9	*	36	347
USWEX	23 Oct – 1 Nov 2018	10	*	9	93
	Total	96	*	122	1,480

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

HSTT Study Area Major Training Exercise Marine Mammal Observations

There were 122 sightings of an estimated 1,480 marine mammals over the course of seven MTEs in the HSTT Study Area (see **Table 1-ii-9**). Breakdown of sightings by species type are shown in **Table 1-ii-10**.

Table 1-ii-10. Total number of marine mammal sightings observed from Navy platforms during Major Training Exercises.

Species Type	# of Sightings	% of Total Sightings	# of Marine Mammals	% of Total Number of Marine Mammals
Dolphins	62	51%	1,386	94%
Whales	47	39%	72	4%
Pinnipeds	11	9%	20	1%
Turtles	0	0%	0	0%
Not recorded	2	1%	2	1%
Totals:	122		1,480	

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 51% of all sightings and 94% of all individuals sighted (**Table 1-ii-10**).

HSTT Study Area Major Training Exercise Mitigations

Sonar mitigation – **Table 1-ii-11** shows the number of marine mammal sightings out of the 122 total sightings reported this period that occurred at ranges less than 1,000 yards and indicates how many sonar mitigations were applied (third column). Other sightings within these ranges were instances when sonar was not in use, therefore sonar mitigation was not conducted (fourth column).

There were also 20 instances of Navy ships maneuvering to avoid marine mammals, or to avoid crossing the path of marine mammals. Of these 20 maneuvers, 12 were to avoid whales (n= 20 whales) and 8 were to avoid dolphins (n= 48 dolphins).

Table 1-ii-11. Number of marine mammal sightings at ranges less than 1,000 yards observed from Navy platforms during Major Training Exercises concurrent with sonar mitigation.

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 sightings	3 sightings of 4 whales
	Dolphins	2 sightings of 60 dolphins	12 sightings of 98 dolphins
	Pinnipeds	0 sightings	3 sightings of 4 pinnipeds
	Turtles	0 sightings	0 sightings
	Generic	0 sightings	0 sightings
200-500 yards			
	Whales	1 sighting of 1 whale	10 sightings of 16 whales
	Dolphins	1 sighting of 10 dolphins	17 sightings of 530 dolphins
	Pinnipeds	0 sightings	4 sightings of 7 pinnipeds
	Turtles	0 sightings	0 sightings
	Generic	0 sightings	0 sightings
501-1000 yards			
	Whales	0 sightings	11 sightings of 16 whales
	Dolphins	0 sightings	14 sightings of 401 dolphins
	Pinnipeds	0 sightings	2 sightings of 7 pinnipeds
	Turtles	0 sightings	0 sightings
	Generic	0 sightings	0 sightings

SUMMARY: Mitigation Effectiveness and Navy Mitigation Zone Adherence

During this year’s MTEs in the HSTT Study Area, prescribed NMFS mitigation zones were effectively applied in cases of observation of marine mammals within the applicable zone. **Table 1-ii-12** depicts the maximum estimated receive levels by the marine mammal at the time the mitigation measure was applied. In each case, the Permanent Threshold Shift (PTS) threshold is higher than the estimated maximum exposure level prior to mitigation which means that the marine mammal was unlikely to experience injury. During this reporting period the proper implementation of mitigation measures for sighted marine mammals is estimated to be highly effective at preventing exposures that may result in injury (e.g. PTS).

The three categories of mitigation measures (Personnel Training, Lookout and Watchstander Responsibility, and Operating Procedures) outlined in the HSTT Final Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) of August 2013 and approved by NMFS in the HSTT Study Area LOA 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 (including on-line training required for watch standing qualifications) with over 4,210 hours completed this year representing training to 5,621 personnel, adherence to required active sonar mitigation zones, and application of lessons learned in marine mammal sighting and reporting.

Table 1-ii-12. Sightings where sonar was on during detection of marine mammals at ranges less than 1,000 yards, and the mitigation conducted.

Location	MTE	Month	Species sighted	# of marine mammals sighted	Platform	Length of time observed (min)	Range at which marine mammals sighted	Mitigation (Sonar powerdown, sonar shutdown)	Estimate MAX exposure PRIOR to mitigation (dBr Iurpa) ¹	Number of minutes sonar mitigation applied	Estimate exposure AFTER mitigation (dBr Iurpa) ¹	DISTANCE ship would have moved given length of mitigation and nominal 10-knot ship speed (yds)	If source in use is hull-mounted sonar, relative bearing of animal from ship and estimation of animal's motion relative to ship	Observed behavior
HRC	RIMPAC	Jul	dolphin	10	Small craft	60	<200	Canceled underwater detonation	na	na	na	na	na	Swimming
SOCAL	IAC	Aug	dolphin	50	Helio	45	<200	Delayed dipping sonar	None	45	None	na	na	nr
SOCAL	IAC	Aug	whale	1	DDG	2	200-500	Shutdown sonar	<181-189	nr	None	na	Whale bearing 045R, opening ship	Swimming near surface

Notes:

¹Estimated exposure based on 20Log[R] spherical spreading propagation loss for ranges less than 1,000 yards and where nominal active sonar Source Level (SL) assumed to be 235 dB for CGs and DDGs. Actual operating parameters and oceanographic condition likely result in lower exposure. This calculation assumes exposure prior to mitigation. Once animal was spotted at the range indicated, applied mitigation would have resulted in much lower to no exposures.

Exposure Assessment

Estimated exposures within 2,000 yards can be determined based on standard formulas of how sound propagates in water. Spherical spreading is generally valid within 1,000 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 1,000 yards equates to 60 dB of loss. At ranges between 1,000 and 2,000 yards, the sound waves become trapped by the sea surface and bottom and cannot expand vertically. The spreading wave then forms an expanding cylinder. Cylindrical spreading loss in dB between two points can be calculated by using the formula $(10\log R_2/R_1)$, with “R2” being the longer range, and “R1” being 1,000 yards. Cylindrical spreading loss between 1,000 and 2,000 yards equates to an additional 3 dB of loss. By the time the wave has propagated to 2,000 yards, the sonar signal strength has decreased by a total of 63 dB. Using the AN/SQS-53 sonar as an example, transmitting at 235 dB and subtracting the 63 dB of spreading loss equates to an estimated sonar Receive Level (RL) of 172 dB at 2,000 yards. The spreading loss formulas are used to make very conservative assumptions about potential exposure. The formula is an estimation of spreading losses only and does not take into account other factors that could increase the total propagation losses such as oceanographic conditions, attenuation losses, scattering losses, and Navy-unique MFAS operating parameters which would result in slightly lower sonar transmit levels. Use of this approach to estimate potential RL at any given animal assumes the horizontal range from a visual sighting accounts for an animal across all depths at which an animal travels to predict the maximum, worst case potential exposure. In other words, this estimated worst case exposure is presented independent of the animal’s actual depth level, since a) time and depth of current and previous dives cannot be deduced from a limited surface sighting, and b) oceanographic and tactical conditions influence actual sound propagation at different depths. Given the relative motion of ships and animals at sea, the time spent with any given exposure from surface ships is likely to be limited.

(iii) Exercise Information for each SINKEK

Two SINKEK events were conducted in the HSTT Study Area during the reporting period, one on 12 July 2018 and one on 19 July 2018. Both events occurred in the Hawaii Range Complex during the Rim of the Pacific exercise. Specific details of these events are classified and this information has been forwarded to NMFS in the classified version of this report.

Table 1-iii-1. SINKEK information for event on 12 July 2018.

(A) Vessels and aircraft involved
Information is contained in the classified version of this report
(B) Location (operating area)
Hawaii Range Complex
(C) Chronological list of events
Information is contained in the classified version of this report
(D) Visibility/weather
Visibility – 10 NM Wind – 060T at 15 KTS Wave Height – 6-7 FT, sea state 2 Cloud Cover – 20% at 1,200 FT base and 4,500 FT cloud tops
(E) Aircraft surveys
1x S-61N helicopter; altitude less than 1,000 FT; speed 100 KTS; 315 square miles surveyed (AM) 1x S-61N helicopter; altitude less than 1,000 FT; speed 100 KTS; 315 square miles surveyed (PM) 3x AH-64 helicopter; altitude less than 1,000 FT; speed 100 KTS; 315 square miles surveyed
(F) Passive acoustic monitoring

P-3 laid 12-buoy pattern in support of the event
(G) Individual marine mammal sighting information
No marine mammals were reported during the event
(H) Ordnance used and net explosive weight (NEW)
48x 2.75" Hydra rockets (3 lb NEW) 4x Harpoon (488 lb NEW) 1x Norwegian Naval Strike Missile (276 lb NEW) 4x Japan Type-12 Surface to Surface Missile (496 lb NEW) 4x Joint Stand Off Weapon (192 lb NEW) 1x GBU-10 (945 lb NEW) 6x GBU-16 (445 lb NEW) 1x Mk-48 (650 lb NEW) 440x 30mm rounds (non-explosive)
Total NEW: 9,389 lb

Table 1-iii-2. SINKEX information for event on 19 July 2018.

(A) Vessels and aircraft involved
Information is contained in the classified version of this report
(B) Location (operating area)
Hawaii Range Complex
(C) Chronological list of events
Information is contained in the classified version of this report
(D) Visibility/weather
Visibility – 10 NM Wind – 080T at 14 KTS Wave Height – 6-7 FT, sea state 2 Cloud Cover – ceiling varied between broken and overcast, 4,000 FT to 7,000 FT
(E) Aircraft surveys
1x PMRF helo; altitude 500 FT; speed 30 KTS; 29 square miles surveyed 1x PMRF helo; altitude 10,000 FT; speed 50 KTS; 29 square miles surveyed
(F) Passive acoustic monitoring
No buoys deployed
(G) Individual marine mammal sighting information
No marine mammals were reported during the event
(H) Ordnance used and net explosive weight (NEW)
2x AGM-65 (300 lb NEW) 2x Harpoon (488 lb NEW)
Total NEW: 1,576 lb

(2) HSTT – Summary of Sources Used

(i) Total annual usage of each type of sound source

This section summarizes total annual usage of each type of sound source used for training within the HSTT Study Area.

Table 2-i-1. Training sound source usage within the HSTT Study Area by source bin.

Authorized sound sources 50 CFR §218.70 (c) and NMFS HSTT LOA	Authorized Amount (26Dec17- 20Dec18)	Actual Usage (26Dec17- 20Dec18)	% Used of Authorized Amount	
(A) Non-impulsive Sources Used During Training				
MF1	11,588 hours	*	*	
MF1K	88 hours	*	*	
MF2	3,060 hours	*	*	
MF2K	34 hours	*	*	
MF3	2,336 hours	*	*	
MF4	888 hours	*	*	
MF5	13,718 items	*	*	
MF11	1,120 hours	*	*	
MF12	1,094 hours	*	*	
HF1	1,754 hours	*	*	
HF4	4,848 hours	*	*	
ASW1	224 hours	*	*	
ASW2	1,800 items	*	*	
ASW3	16,561 hours	*	*	
ASW4	1,540 items	*	*	
TORP1	170 items	*	*	
TORP2	400 items	*	*	
(B) Annual Number of Impulsive Source Detonations During Training				
E1	0.1 lb to 0.25 lb NEW	19,840 detonations	10,337	52%
E2	0.26 lb to 0.5 lb NEW	1,044 detonations	487	47%
E3	>0.5 lb to 2.5lb NEW	3,020 detonations	4,070	135% ¹
E4	>2.5 lb to 5 lb NEW	668 detonations	10	2%
E5	>5 lb to 10 lb NEW	8,154 detonations	574	7%
E6	>10 lb to 20 lb NEW	538 detonations	251	47%
E7	>20 lb to 60 lb NEW	407 detonations	0	0%
E8	>60 lb to 100 lb NEW	64 detonations	4	6%
E9	>100 lb to 250 lb NEW	16 detonations	3	19%
E10	>250 lb to 500 lb NEW	19 detonations	12	63%
E11	>500 lb to 650 lb NEW	8 detonations	0	0%
E12 ²	>650 lb to 1,000 lb NEW	224 detonations	59	26%
E13	>1,000 lb to 1,740 lb NEW	9 detonations	0	0%

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

¹ Total 5-year usage for E3 was 35% (Table 2-i-2).

² Bomb detonations (all NEWs) were modeled as E12 and are totaled here.

Table 2-i-2. 5-year cumulative source usage within the HSTT Study Area by source bin.

Sound Source Bin	Year 1 Actual Usage (26Dec13-25Dec14)	Year 2 Actual Usage (26Dec14-25Dec15)	Year 3 Actual Usage (26Dec15-25Dec16)	Year 4 Actual Usage (26Dec16-25Dec17)	Year 5 Actual Usage (26Dec17-20Dec18)	5-yr Authorized Amount (26Dec13-20Dec18)	5-yr Cumulative Actual Usage (26Dec13-20Dec18)	% Used of 5-yr Authorized Amount
(A) Active Acoustic Sources Used During Annual Training								
MF1	*	*	*	*	*	57,940 hours	*	*
MF1K	*	*	*	*	*	440 hours	*	*
MF2	*	*	*	*	*	15,300 hours	*	*
MF2K	*	*	*	*	*	170 hours	*	*
MF3	*	*	*	*	*	11,680 hours	*	*
MF4	*	*	*	*	*	4,440 hours	*	*
MF5	*	*	*	*	*	68,590 items	*	*
MF11	*	*	*	*	*	5,600 hours	*	*
MF12	*	*	*	*	*	5,470 hours	*	*
HF1	*	*	*	*	*	8,770 hours	*	*
HF4	*	*	*	*	*	24,240 hours	*	*
ASW1	*	*	*	*	*	1,120 hours	*	*
ASW2	*	*	*	*	*	9,000 items	*	*
ASW3	*	*	*	*	*	82,805 hours	*	*
ASW4	*	*	*	*	*	7,700 items	*	*
TORP1	*	*	*	*	*	850 items	*	*
TORP2	*	*	*	*	*	2,000 items	*	*
(B) Explosive Sources Used During Annual Training								
E1	6,850	0	2,662	13,392	10,337	99,200 detonations	33,241	34%
E2	268	0	1,185	721	487	5,220 detonations	2,661	51%
E3	651	178	305	128	4,070	15,100 detonations	5,332	35%
E4	62	5	16	189	10	3,340 detonations	282	8%
E5	1,311	1,414	3,136	462	574	40,770 detonations	6,897	17%
E6	45	93	97	60	251	2,690 detonations	546	20%
E7	0	0	0	0	0	2,035 detonations	0	0%
E8	1	4	26	14	4	320 detonations	49	15%
E9	5	11	25	15	3	80 detonations	59	74%
E10	13	10	10	13	12	95 detonations	58	61%
E11	0	0	0	0	0	40 detonations	0	0%
E12 ¹	185	0	60	70	59	1,120 detonations	370	33%
E13	5	0	0	0	0	45 detonations	5	11%

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

¹Bomb detonations (all NEWs) were modeled as E12 and are totaled here.

(C) Total annual airgun use

Airguns were not used within HSTT for training during this reporting period. Airgun use is not an authorized source for training in the HSTT Letter of Authorization or Final Rule, but reporting requirements for this source are specified in the reporting section for training in the HSTT Letter of Authorization.

(D) Improved Extended Echo-Ranging System (IEER) sonobuoy summary

IEER sonobuoys were not used within the HSTT. IEER buoys have been phased out of the training inventory, and are no longer planned for use during training in HSTT.

(3) HSTT – Sonar Exercise Notification

The Navy submitted all required information to NMFS for all MTEs during the reporting period, including location of the exercise, beginning and end dates of the exercise, and type of exercise.

(4) HSTT – Geographic Information Presentation

The precise locations and frequency of sonar use 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, this information was forwarded to NMFS in the classified version of this report.

(5) HSTT – Special Reporting Requirements

(i) Total Sonar Hours (dense humpback areas)

Hull-mounted mid-frequency active sonar use within the dense humpback areas between 15 December and 15 April of this reporting period has been included in the classified version of this report.

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

Hull-mounted mid-frequency active sonar was not used within or in the vicinity of the Humpback Whale Cautionary Area between 15 December and 15 April of this reporting period.

(6) HSTT – 5-Year Close-out Report

In accordance with section 7(h) of the Training Letter of Authorization, this report serves as the 5-year close-out report. The annual totals of each sound source bin with a comparison to the 5-year allowance are presented in section 2 and in the classified version of this report.