Submitted in support of the 2013 Annual Marine Species Monitoring report for the U.S. Navy's Mariana Islands Range Complex

GUAM AND SAIPAN MARINE SPECIES MONITORING: WINTER-SPRING SURVEY

MARINE SPECIES MONITORING

VESSEL-BASED MONITORING SURVEYS

TRIP REPORT

Naval Facilities Engineering Command

15-29 March 2012

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Cover photo: Melon-headed whale (*Peponocephala electra*) off Guam, 15 March 2012. Photo taken by Mark Deakos under National Marine Fisheries Service permit 14451.

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Acronyms and Abbreviations

BSS	Beaufort sea state
CNMI	Commonwealth of the Northern Mariana Islands
ESA	Endangered Species Act
ft	foot/feet
GIS	Geographical Information System
GPS	Global Positioning System
hr	hour(s)
kHz	kilohertz
km	kilometer(s)
m	meter(s)
min	minute(s)
MMPA	Marine Mammal Protection Act
MISTCS	Mariana Islands Sea Turtle and Cetacean Survey
M/V	motor vessel
NAVFAC PAC	Naval Facilities Engineering Command Pacific
NM	nautical mile(s)
NMFS	National Marine Fisheries Service
SPUE	Sightings Per Unit Effort
U.S.	United States
XBT	expendable bathythermograph

Section 1 Introduction

Prior to 2007, there was little information available about the occurrence, abundance, or density of marine mammals in the region of the Commonwealth of the Northern Mariana Islands (CNMI). Most accounts of marine mammal occurrence within the region were opportunistically reported sighting and stranding data. For example, the United States (U.S.) Navy compiled a comprehensive review of data and literature concerning the protected and managed marine resources for the Marianas Operating Area (DoN 2007), which assessed the area south of Pagan and included the waters off Guam, Saipan, Tinian, and Farallon de Medinilla. The Mariana Islands Sea Turtle and Cetacean Survey (MISTCS), conducted between January and April 2007 in waters around Guam and the CNMI, was the first systematic survey effort for marine mammals in this region (DoN 2007; Fulling et al. 2011). The surveyed area included waters off Guam and Tinian; however, the northern boundary of the MISTCS survey area was south of Pagan. The U.S. Navy proactively initiated the visual and acoustic survey to gather data in support of an analysis of potential effects of U.S. Navy training exercises in the Mariana Islands Range Complex Environmental Impact Statement and associated Marine Mammal Protection Act and Endangered Species Act consultations. Other recent data from this region include marine mammal monitoring efforts associated with U.S. Navy training exercises (Valiant Shield 2007) south of Saipan and east of Guam and Rota during August 2007 (Mobley 2007). Small-boat surveys partially-funded by the U.S. Navy and the National Marine Fisheries Service (NMFS) were conducted around the islands of Guam, Tinian, and Saipan between February and March 2010 (Ligon et al. 2011); waters surrounding Guam during February to March 2011 (HDR 2011); and the waters surrounding Guam, Saipan, Tinian, Aguijan, and Rota during August to September 2011 (Hill et al. 2012). Although there have been several marine species surveys in this area since 2007, there is little information for some areas and across seasons.

This report presents the results of the Guam and Saipan Marine Species Monitoring: Winter-Spring Survey conducted on the motor vessel (*M/V) Sea Fantasy* (Guam survey) and the *M/V Super Emerald* (Saipan survey) from 15 to 29 March 2012. The objective of the 2012 survey effort was to conduct baseline surveys to further document marine mammal and sea turtle occurrence in nearshore waters around the island of Guam and Saipan. The approach primarily followed opportunistic survey protocols used in recent surveys around Guam (Ligon et al. 2011; HDR 2011), which remained within 10 kilometers (km) or 5.4 nautical miles (NM) of the coastline.

Section 2 Methods

Visual Surveys

The survey was conducted from 15 to 29 March 2012 around the islands of Guam and Saipan. The surveys were conducted off Guam from 15 to 21 March (during 16 to 18 March, there were no surveys due to high winds and large swell) and off Saipan from 23 to 29 March. The platform used for the Guam surveys was the *M/V Sea Fantasy,* a 12.8-meter (m) (42-foot [ft]) vessel with an observer height of 4.1 m (13.1 ft) and the platform used for the Saipan surveys was the *M/V Super Emerald*, a 19.8-m (65-ft)

vessel with an observer height of 5.2 m (17.1 ft) (see **Figure 1**). Sighting data were collected during daylight hours when weather conditions permitted (e.g., Beaufort sea state [BSS] of 0 to 6 and visibility more than 1.9 km [1.0 NM]). Non-systematic survey methods (no pre-determined tracklines) were employed in order to maximize survey effort during less than ideal weather conditions. The survey was conducted using an observation team of three individuals—two dedicated observers searching with 7 x 50 hand-held reticle binoculars (Fujinon Polaris FMTRC-SX) at the port and starboard positions, and the third with unaided eyes and 7 x 50 hand-held reticled binoculars (centerline position and data recorder). Four observers rotated through the three observer positions every 30 minutes (min). All marine species observers were experienced with marine species survey methodology, had experience in identification of subtropical Pacific marine mammal and sea turtle species, were knowledgeable about marine mammal biology and behavior, and had previous experience conducting marine mammal observations from vessel platforms (see **Table 1**).

Figure 1. The survey vessels - the *M/V Sea Fantasy* (Left) used for surveys off Guam and the *M/V Super Emerald* used for surveys off Saipan (Right). Photographs are from the Micronesia Divers Association.

Table 1. Observers and roles.

Name	Role	Organization
Phil Thorson	Cruise Leader	HDR
Mark Deakos	Marine Species Observer	HDR
Paula von Weller	Marine Species Observer	HDR
Suzanne Yin	Marine Species Observer	HDR
Jennifer Brown	Marine Species Observer Trainee (2 days)	HDR
Robert Uyeyama	U.S. Navy Technical Representative (2 days)	NAVFAC PAC*

Note: *NAVFAC PAC = Naval Facilities Engineering Command Pacific

A daily watch for sightings of marine mammals and sea turtles was maintained on the flying bridge of each survey vessel during daylight hours (approximately 06:30 to 16:00 Guam Standard Time). By 13:00 to 16:00, observation conditions usually had deteriorated, due to high wind and/or high swell, and the

survey was ended for the day. Surveys off Guam were suspended completely for three days during a period of very high winds and large swells which made it unsafe to attempt vessel-based observations. Data for observation conditions, watch effort, sightings, and other required information were entered into a laptop computer using the computer program VisSurvey (NMFS Southeast Fisheries Science Center).

When sightings occurred, photographs of marine species were taken to verify species identification and, if possible, identification of individuals (marine mammals only). The animals photographed were approached by the vessel during normal survey operations or approached the vessel on their own. Efforts were made to position the vessel to maximize image quality for identification purposes (with respect to lighting, glare, etc.). Photographs were taken using Canon EOS D7 or Nikon D3000 cameras with 100 to 400 millimeter zoom lenses. Camera settings were adjusted as needed to produce the highest-quality images possible. Observations were made under NMFS permit 14451 issued to Dr. Joseph Mobley.

Acoustic Recordings

There is little acoustic information available for marine mammals in the Mariana Islands. Acoustic recordings were attempted during sightings and randomly during periods when animals were not sighted in an attempt to detect vocalizing animals in the area. The ability to link acoustic recordings with confirmed visual sightings of particular species allows scientists to gather valuable information required to develop better acoustic classifiers and detectors. A five-channel acoustic recorder (Edirol/Roland R-44) and hydrophone (Reson Model TC4033-6) were used to record vocalizations of marine mammals during sightings. The hydrophone was deployed by hand and suspended approximately 3 to 4 m (10 to 13 ft) below the surface. Sampling was made at 16 bits and 192 kilohertz (kHz).

Oceanographic Data Collection

The collection of oceanographic data was deemed a priority during the initial planning stages with data to be collected using an expendable bathythermograph (XBT) data acquisition system and an XBT hand-held launcher following all marine mammal sightings. However, the XBT data-collection software originally set up for use on this survey was not functioning properly, and therefore, no oceanographic data were collected.

Data Processing

Tracklines and sightings from VisVessel were entered into a Geographical Information System (GIS), and used to calculate distance and effort (ArcGIS version 10, Environmental Systems Research Institute, Redlands, California). Bottom depths for sightings were extrapolated from existing GIS data (ArcGIS Ocean Basemap).

Section 3 Results

Survey Effort

Visual surveys were made over 664.0 km (358.5 NM) of tracklines during 11 survey days for a total of 80.3 survey hours (hr) (see **Table 2; Figures 2 and 3**) off Guam and Saipan. BSS ranged from two to seven, with 95.7 percent of effort in BSS three to six (see **Table 3**). Sightings were made during BSS ranging from two to six (**Table 3**).

Table 2. Daily survey effort, cetacean sightings, and sea turtle sightings.

Date	Island	Survey Effort		No. Cetacean Sightings	No. Sea Turtle Sightings
		Duration (hr)	Distance (km)		
15 March 2012	Guam	6.7	46.9	1	0
19 March 2012	Guam	9.4	79.3	3	0
20 March 2012	Guam	8.3	71.0	0	1
21 March 2012	Guam	9.2	71.3	2	1
23 March 2012	Saipan	6.5	57.4	1	0
24 March 2012	Saipan	6.0	60.5	1	2
25 March 2012	Saipan	8.0	56.9	1	1
26 March 2012	Saipan	6.8	57.4	0	0
27 March 2012	Saipan	8.0	69.8	1	0
28 March 2012	Saipan	5.9	46.1	0	1
29 March 2012	Saipan	5.5	47.4	0	0
Total for Guam		**33.56**	**268.5**	**6**	**2**
Total for Saipan		**46.75**	**395.5**	**4**	**4**
Total for all days		**80.31**	**664.0**	**10**	**6**

Guam

Surveys off Guam were conducted on 15 and 19 to 21 March 2012 for a total of 33.6 hr and 268.5 km (145.0 NM). Due to high swells and high wind conditions, there were no surveys from 16 to 18 March which reduced the total number of survey days off Guam from a planned seven to four (see **Table 2**). While surveys were planned to surround the entire island of Guam, weather conditions and the *M/V Sea Fantasy*'s limited capabilities to handle high sea states constrained the survey effort to the northern and western sections of the island (see **Figure 2**). Six sightings of marine mammals representing five confirmed species were made in the waters off Guam. The trackline for 15 March was taken from the vessel's Global Positioning System (GPS) receiver (Garmin GPSMAP 441, Olathe, Kansas) because of a malfunction with the interface between the GPS antenna and the program VisSurvey. That problem was corrected and the vessel's position was recorded directly into VisSurvey for all other survey days.

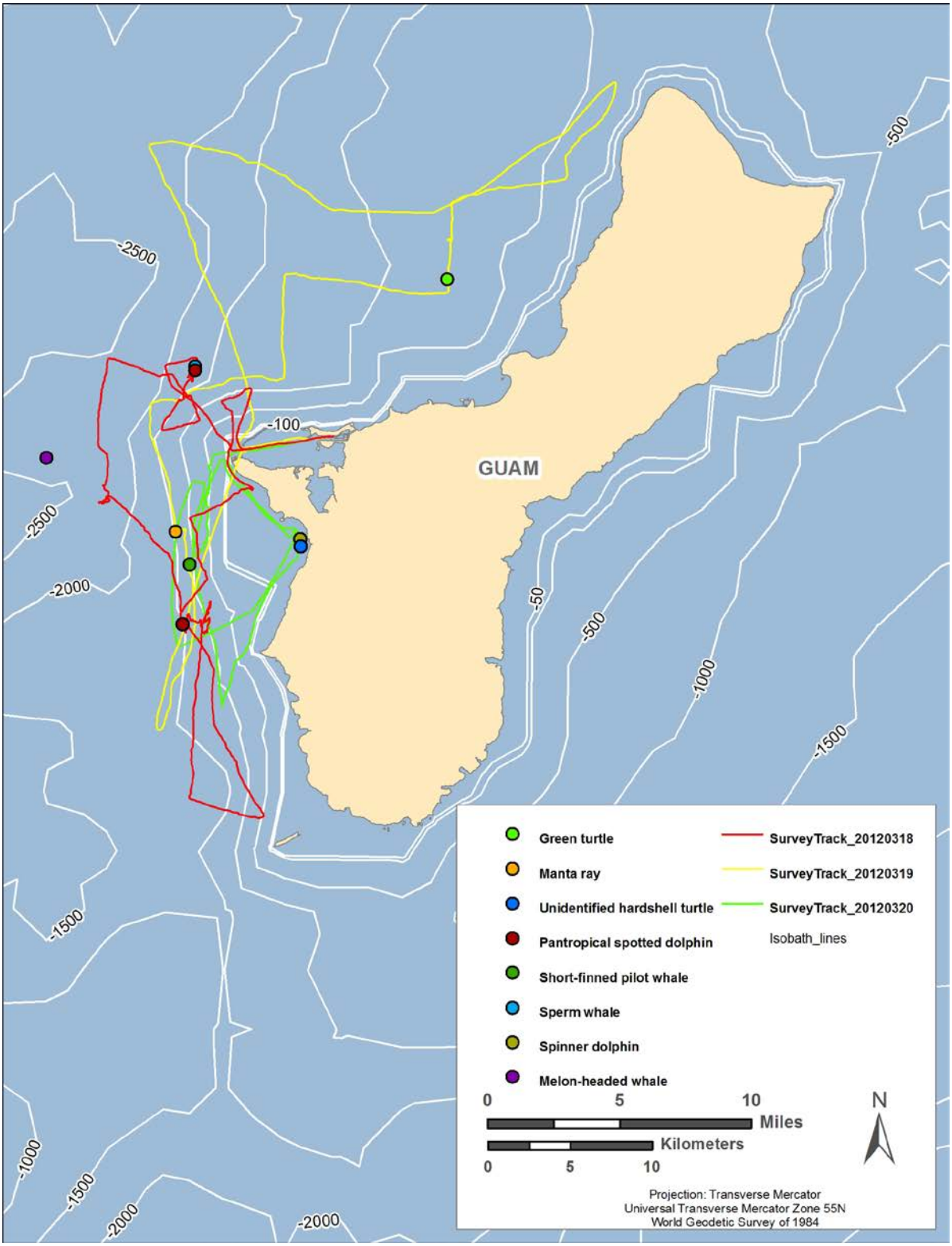

Figure 2. Tracklines and sightings off Guam during the Guam and Saipan Marine Species Monitoring Survey: Winter-Spring 2012. Surveys were conducted on 15 and 19 through 21 March 2012.

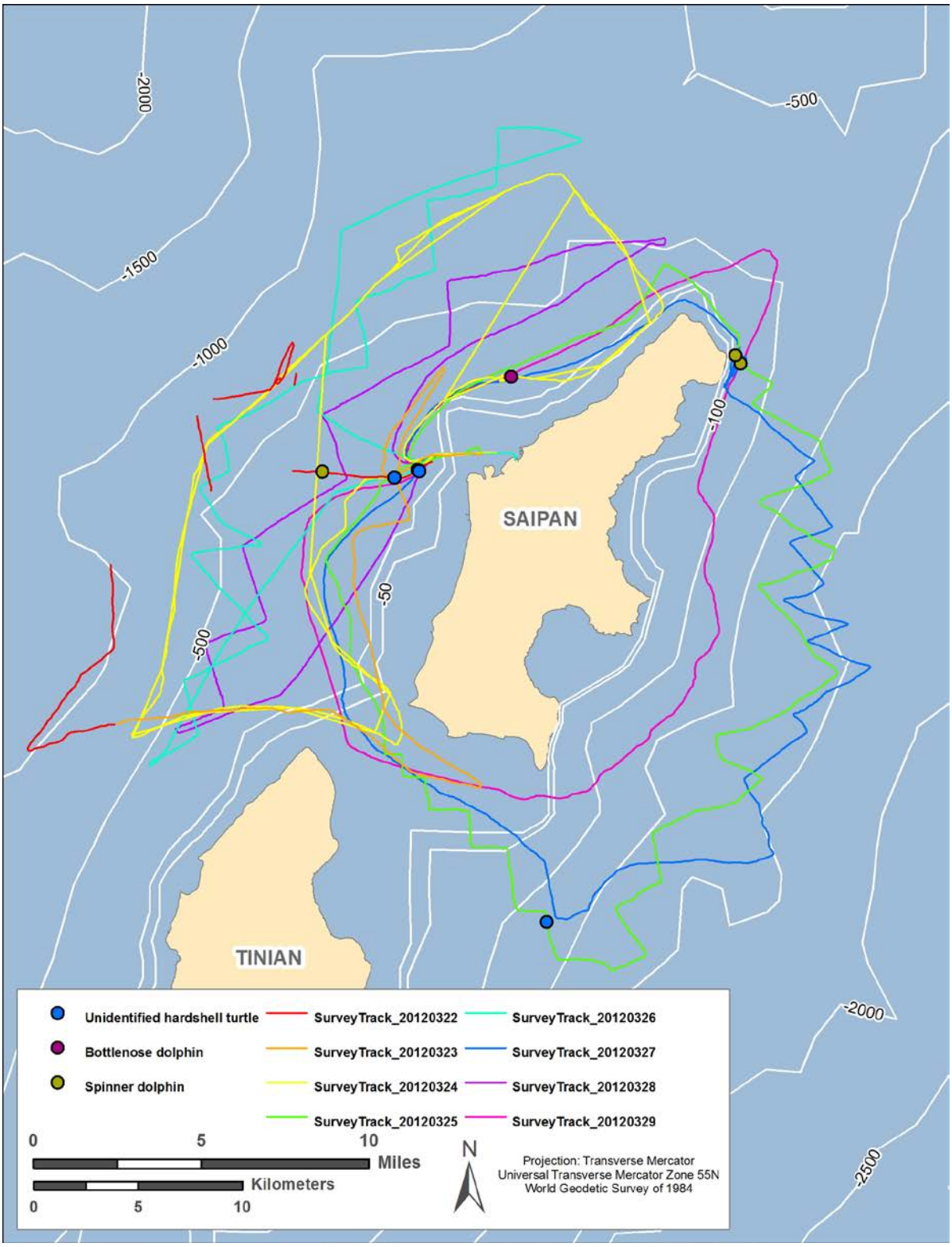

Figure 3. Tracklines and sightings off Saipan during the Guam and Saipan Marine Species Monitoring Survey: Winter-Spring 2012. Surveys were conducted during 23 to 29 March 2012. Gaps in the 23 March (red) trackline are due to a GPS interface problem that was corrected for the second part of the trackline (gold).

Table 3. Total survey effort, sightings by Beaufort Sea State, and Sightings Per Unit Effort (SPUE).

Beaufort Sea State	Total Effort (km)	Total Effort (hr)	Percentage of Survey Effort	Marine Mammal Sightings	SPUE Marine Mammal (per km)	SPUE Marine Mammal (per hr)	Sea Turtle Sightings	SPUE Sea Turtles (per km)	SPUE Sea Turtles (per hr)
0	0	0	0	0	0	0	0	0	0
1	17.3	2.1	2.6	0	0	0	0	0	0
2	19.9	2.4	3.0	0	0	0	1	0.02	0.42
3	75.0	9.1	11.3	4	0.05	0.44	0	0	0
4	177.3	21.4	26.7	1	0.01	0.05	1	0.01	0.05
5	290.8	35.2	43.8	3	0.01	0.09	1	0.01	0.03
6	83.6	10.1	12.6	2	0.02	0.20	3	0.05	0.30
Total	**664.0**	**80.3**	**100**	**10**	**0.02**	**0.13**	**6**	**0.01**	**0.01**
Guam	**268.5**	**33.6**	**41.8**	**6**	**0.02**	**0.18**	**2**	**0.01**	**0.06**
Saipan	**395.5**	**46.8**	**58.2**	**4**	**0.01**	**0.09**	**4**	**0.01**	**0.09**

Saipan

Surveys off Saipan were conducted from 23 to 29 March 2012, for a total 46.8 hr and 395.5 km (213.6 NM) (see **Table 2**). The survey boat, *M/V Super Emerald* was able to travel around Saipan on three of the survey days but otherwise remained on the western (leeward) side of the island for the other four survey days (see **Figure 3**).

Sightings

There were 10 confirmed cetacean sightings (six species), six sea turtle sightings (one identified species), and one sighting of a ray (*Manta* sp.) at the islands of Guam and Saipan (see **Tables 4 and 5**, and **Figures 2 and 3**). The spinner dolphin was the most frequently sighted (40 percent) cetacean species. The majority (60 percent) of cetacean sightings occurred off Guam which also had the highest marine mammal species diversity – five cetacean species compared to two at Saipan. There were twice as many sightings of sea turtles at Saipan compared to Guam.

Guam

Six cetacean sightings comprised of five species were recorded off Guam. The pantropical spotted dolphin (*Stenella attenuata*) was the most frequently sighted species (*n*=2 sightings) followed by one sighting of melon-headed whales (*Peponocephala electra*), one sighting of short-finned pilot whales (*Globicephala macrorhynchus*), one sighting of sperm whales (*Physeter macrocephalus*), and one sighting of spinner dolphins (*Stenella longirostris*). Two sea turtles were sighted; however, only one sighting could be confirmed as a juvenile green turtle (*Chelonia mydas*) which was sighted in offshore waters with a bottom depth of 1,100 m (3,609 ft). The second sighting was of a submerged sea turtle (1 to 2 m below the water's surface) in waters with a bottom depth of 50 m (164 ft) and was thought to be a green or hawksbill (*Eretmochelys imbricata*) turtle based on the carapace and head shape. There was also one sighting of a manta ray.

Saipan

Four cetacean sightings comprised of two species were recorded off Saipan. The spinner dolphin was the most frequently sighted species (75 percent; *n*=3 sightings) followed by one sighting of bottlenose dolphins (*Tursiops truncatus*). Four sightings of unidentified hardshell turtles, three of which were believed to be green turtles based on the shape of the carapace and head, were sighted primarily in nearshore waters (80 m [263 ft]); however, there was one sighting of an unidentified hardshell turtle made in offshore waters with a bottom depth of 400 m (1,312 ft).

Sightings Per Unit Effort (SPUE)

Sightings Per Unit Effort (SPUE) was calculated as the total number of marine mammal sightings (*n*=10), and sea turtle sightings (*n*=6) divided by the total survey effort (hr and km). For this monitoring effort, the SPUE for marine mammals in Guam and Saipan combined was 0.13 sightings/hr and 0.02 sightings/km (see **Table 3**). The SPUE for sea turtles in Guam and Saipan combined was 0.01 sightings/hr or 0.01 sightings/km (see **Table 3**).

Table 4. Summary of sightings and observations.

Sighting No.	Time (Guam Standard Time)[1]	Species	BSS	Group Size Best/High/Low			Latitude (°N)	Longitude (°E)	Vessel Heading[2]	Animal Bearing[2]	Distance From Vessel (m)	Bottom Depth (m)	Notes
15 March 2012 - Guam													
1	07:25	Melon-headed whale (*Peponocephla electra*)	6	100	110	95	13.44700	144.51411	169	195	135	2,600	ID photos taken, but no acoustic recordings; 4 calves
19 March 2012 - Guam													
2	07:04	Sperm whale (*Physeter macrocephalus*)	3	10	10	10	13.49780	144.59724	273	50	45	1,200	ID photos and acoustic recordings, 1 calf.
3	07:10	Pantropical spotted dolphin (*Stenella attenuata*)	3	6	8	3	13.49583	144.59718	273	35	65	1,200	No ID photos obtained, acoustic recordings collected, no calves.
4	11:04	Pantropical spotted dolphin (*Stenella attenuata*)	5	30	34	20	13.35600	144.59149	172	5	70	1,400	ID photos and acoustic recordings, up to 3 calves, and 8 or more juveniles.
20 March 2012 - Guam													
No marine mammal sightings													
5	10:42	Green turtle (*Chelonia mydas*)	4	1	-	-	13.54723	144.73885	58	10	30	1,100	Small juvenile, 25 to 30-cm carapace, sighted at water's surface.
6	15:20	Manta ray (*Manta* sp.)	5	1	-	-	13.40678	144.58714	192	30	40	600	Estimated size of 2.7 m across.
21 March 2012 - Guam													
7	06:56	Spinner dolphin	2	20	20	20	13.40335	144.65724	183	15	60	50	ID photos and acoustic recordings, no calves.

Sighting No.	Time (Guam Standard Time)[1]	Species	BSS	Group Size Best/High/Low			Latitude (°N)	Longitude (°E)	Vessel Heading[2]	Animal Bearing[2]	Distance From Vessel (m)	Bottom Depth (m)	Notes
21 March 2012 - Guam (continued)													
8	07:25	Unidentified hardshell turtle	2	1	-	-	13.39937	144.65756	46	90	30	50	Small juvenile, ~25-cm carapace, sighted at 1-2 m below the water's surface. Unidentified hardshell turtle (possibly a green turtle or hawksbill turtle [*Chelonia mydas* or *Eretmochelys imbricata*]).
9	12:42	Short-finned pilot whale (*Globicephala macrorhynchus*)	5	23	27	18	13.33893	144.59540	350	45	110	1,300	ID photos and acoustic recordings, no calves.
23 March 2012 - Saipan													
10	06:44	Spinner dolphin (*Stenella longirostris*)	5	15	15	15	15.22046	145.65085	274	45	150	180	No ID photos obtained, no acoustic recordings, no calves.
24 March 2012 - Saipan													
11	06:54	Bottlenose dolphin (*Tursiops truncatus*)	6	11	11	11	15.26191	145.73473	260	5	45	100	Briefly sighted then the group moved toward shore, photos taken, no calves.
12	12:10	Unidentified hardshell turtle	6	1	-	-	15.21820	145.68284	80	35	25	80	Adult, sighted just below the water's surface. Probably a green turtle (*Chelonia mydas).*
13	12:14	Unidentified hardshell turtle	6	1	-	-	15.22155	145.69322	45	5	15	80	Juvenile, sighted just below the waters' surface. Probably a green turtle (*Chelonia mydas).*

Sighting No.	Time (Guam Standard Time)[1]	Species	BSS	Group Size Best/High/Low			Latitude (°N)	Longitude (°E)	Vessel Heading[2]	Animal Bearing[2]	Distance From Vessel (m)	Bottom Depth (m)	Notes
25 March 2012 - Saipan													
14	08:21	Spinner dolphin (*Stenella longirostris*)	6	14	14	11	15.26819	145.83718	244	50	160	200	No ID photos obtained, acoustic recordings collected, at least 1 calf.
15	12:21	Unidentified hardshell turtle	6	1	-	-	15.02600	145.75200	354	15	5	400	1-m diameter carapace, 2-3 m below water's surface.
26 March 2012 - Saipan													
No sightings													
27 March 2012 - Saipan													
16	07:38	Spinner dolphin (*Stenella longirostris*)	4	20	20	20	15.25989	145.83065	68	45	200	200	ID photos and acoustic recordings, at least 1 calf.
28 March 2012 - Saipan													
17	12:10	Unidentified hardshell turtle	5	1	-	-	15.22100	145.69400	9	90	250	80	Adult. Probably a green turtle (*Chelonia mydas).*
29 March 2012 - Saipan													
No sightings													

Note: [1]Greenwich Mean Time + 10 hours, [2]Vessel heading is magnetic, [3]Animal bearing is relative to ship, cm = centimeter(s)

Table 5. Summary of cetacean sightings by species, location, bottom depth, and percentage of sightings.

Species	Number of Sightings	Location	Bottom Depth (m)	Percentage of all Sightings
Bottlenose dolphin *(Tursiops truncatus)*	1	Saipan	100	10
Melon-headed whale *(Peponocephala electra)*	1	Guam	2,600	10
Pantropical spotted dolphin *(Stenella attenuata)*	2	Guam	1,200-1,400	20
Short-finned pilot whale *(Globicephala macrorynchus)*	1	Guam	1,300	10
Sperm whale *(Physeter macrocephalus)*	1	Guam	1,200	10
Spinner dolphin *(Stenella longirostris)*	1	Guam	50	10
Spinner dolphin *(Stenella longirostris)*	3	Saipan	180-200	30
Total	**10**			**100**

Guam

The SPUE for marine mammals off Guam was 0.18 sightings/hr or 0.02 sightings/km (0.04 sightings/NM). The SPUE for sea turtles off Guam was 0.06 sightings/hr, 0.01 sightings/km, 0.01 sightings/NM.

Saipan

The SPUE for marine mammals off Saipan was 0.09 sightings/hr or 0.01 sightings/km (0.02 sightings/NM). The SPUE for sea turtles off Guam was 0.09 sightings/hr or 0.01 sightings/km (0.02 sightings/NM.

Photographs

A total of 1,376 photographs were collected for all six cetacean species and unidentified hardshell/confirmed sea turtles seen during the survey. Copies of all marine species photographs and survey data are stored at two HDR facilities and a third copy was submitted to Naval Facilities Engineering Command Pacific (NAVFAC PAC). In order to further collaborative efforts, NAVFAC PAC has delivered a copy of the photographs plus survey tracklines to the NMFS' Pacific Islands Fisheries Science Center for comparison to its photo-identification catalogs.

Acoustics

Twenty-one hydrophone recordings were made during surveys off Guam and Saipan, usually in conjunction with a marine mammal sighting. Several recordings were made when no animals were present to determine if any distant or cryptic marine mammal species could be detected. Recorded files were delivered to Bio-Waves Inc. for subsequent analysis with results provided when available.

Section 4 Discussion

Due to the higher than expected sea state conditions and the smaller survey vessel's inability to provide a stable platform in those conditions, the Guam survey (intended to incorporate waters surrounding the island) was modified to survey the nearshore waters out to 18 km (5.4 NM) on the western side. This approach was similar to a previous survey in the Guam (Ligon et al. 2011; HDR 2011). Even restricting the survey to the leeward side of the island, 94.4 percent of the effort was conducted in BSS of 3 to 6, and 70.5 percent were in BSS of 4 to 5, making sighting conditions difficult. Despite the high BSS, 10 cetacean and six sea turtle sightings were made during the 11 days of surveys off the islands of Guam and Saipan. In comparison, the 2011 Guam only winter survey had a smaller number of species sightings over a longer time period (nine sightings, three identified marine mammal species, six days; SPUE = 0.01 sightings per km (0.02 sightings/NM); HDR 2011) *vs.* the 2012 survey (10 sightings, six identified marine mammal species, four days effort; SPUE = 0.02 sightings per km (0.03 sightings/NM). The 2011 Guam winter survey had six sightings of sea turtles over six days of effort, and all were identified as green turtles (SPUE = 0.01 sightings per km (0.01 sightings/NM)) *vs.* the 2012 survey (six sightings, one confirmed and one possible sea turtle species, 4 days; SPUE = 0.01 sightings per km (0.02 sightings/NM).

The larger vessel used off Saipan allowed us to survey completely around the island on three days, although only spinner dolphins were observed on the north end of the island and there were no sightings on the eastern (windward) side. Spinner dolphins were observed on two separate days and according to the vessel's crew, that area on the north end of the island is commonly used by spinner dolphins. The other two sightings off Saipan (spinner and bottlenose dolphins) occurred within 2 km (1.1 NM) of shore not long after leaving the harbor in the morning (within 20 to 30 min).

Marine mammal species diversity in this nearshore survey was higher than observed during the 2011 winter survey (six identified species *vs.* three identified species; HDR 2011) but was not as high as recorded during the MISTCS (DoN 2007; Fulling et al. 2011), Valiant Shield 2007 (Mobley 2007), Oleson and Hill (2010), and Hill et al. (2012) surveys. Those surveys went beyond 20 km (11 NM) offshore of Guam into deep water including near the Mariana Trench, or remained at sea for longer periods of time.

Ligon et al. (2011) also surveyed the nearshore area of Guam as well as Saipan and their sightings also included sperm whales (a group of nine individuals), several pantropical spotted dolphins, and spinner dolphins (the most commonly sighted species during this survey). There were only two sea turtle sighting reported from the before-mentioned marine mammal surveys in the Mariana Islands – a hawksbill turtle sighted in waters deeper than 2,800 m (9,186 ft) during the MISTCS (DoN 2007) and an

unidentified hardshell turtle was sighted (distance from shore and/or bottom depth not provided) during aerial-based monitoring during the Valiant Shield 2007 (Mobley 2007).

Section 5 Acknowledgements

We would like to thank Lee Weber of Micronesia Divers Association, Inc. and the crew of the *M/V Sea Fantasy* and the *M/V Super Emerald* for their assistance throughout the survey cruises. Jennifer Brown and Aude Pacini assisted with logistics.

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APPENDIX A

Species Photo-ID

March 15, 2012, Sighting 1, *P. electra,* HDR2012MAR15-MHD-2449.jpg

March 19, 2012, Sighting 2, *P. macrocephalus,* HDR2012MAR19-MHD-2880.jpg

March 19, 2012, Sighting 4, *S. attenuata,* HDR2012MAR19-MHD-3090.jpg

March 21, 2012, Sighting 7, *S. longirostris,* HDR2012MAR21-MHD-3316.jpg

March 21, 2012, Sighting 9, *G. macrorhynchus,* HDR2012MAR21-MHD-3434.jpg

March 24, 2012, Sighting 11, *T. truncatus,* HDR2012MAR24-MHD-3646.jpg

March 27, 2012, Sighting 16, *S. longirostris,* HDR2012MAR27-MHD-3800.jpg