May 25, 2012

Cruise Report
Marine Mammal and Sea Turtle Observer UNDET Monitoring
Hawaii Range Complex: 19 & 26 October and 2 November 2011

Prepared for:
Commander, U.S. Pacific Fleet

Prepared by:
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List of Acronyms and Abbreviations

ESC	Engineering Service Center
ft	Feet
fsw	Feet of sea water
HRC	Hawaii Range Complex
HST	Hawaii standard time
kts	Knots (nautical miles per hour)
MDSU-1	Mobile Diving Salvage Unit ONE
MFAS	Mid-frequency active sonar
MMO	Marine mammal observer
NEW	Net explosive weight
nm	Nautical miles
NMFS	National Marine Fisheries Service
PMAP	Protective Measures Assessment Protocol
RHIB	Rigid-hulled inflatable boat
RIMPAC	Rim of the Pacific, major training exercise
UNDET	Underwater detonation
VHF	Very high frequency
yd(s)	Yard(s)

1. INTRODUCTION

1.1 MONITORING PLAN

In order to train with mid-frequency active sonar (MFAS) and underwater explosives, the Navy has obtained from the National Marine Fisheries Service (NMFS) a permit under the Marine Mammal Protection Act and a Biological Opinion under the Endangered Species Act. The Hawaii Range Complex (HRC) Monitoring Plan was developed with NMFS to comply with the requirements under the permit. The monitoring plan and reporting will provide science-based answers to questions regarding whether or not marine mammals are exposed and reacting to Navy MFAS. The objectives of the monitoring plan are to answer the following questions:

1. Are marine mammals and sea turtles exposed to MFAS at regulatory thresholds of harm or harassment? If so, at what levels and how frequently are they exposed?

2. If marine mammals and sea turtles are exposed to MFAS in the HRC, do they redistribute geographically in the HRC as a result of repeated exposure? If so, how long does the redistribution last?

3. If marine mammals and sea turtles are exposed to MFAS, what are their behavioral responses? Are they different at various levels?

4. What are the behavioral responses of marine mammals and sea turtles that are exposed to various levels and distances from explosives?

5. Are the Navy's suite of mitigation measures for MFAS and explosives (e.g., Protective Measures Assessment Protocol [PMAP], measures agreed to by the Navy through permitting and consultation) effective at avoiding harm or harassment of marine mammals and sea turtles?

The Marine Mammal Observers (MMO) effort is intended to address questions 4 and 5.

1.2 UNDERWATER DEMOLITION

Purpose—To enable live high explosives training to ensure mission readiness in the identification and destruction or neutralization of service or bottom mines, floating/moored mines, and harbor clearance operations.

Description—Underwater demolition exercises include training in the detection and explosive attack of inert (non-explosive) and service naval mines, as well as conduct of harbor clearance operations. Neutralization of bottom mines involves the diver placing a specific amount of explosives a specific distance from a mine, which when detonated underwater results in neutralization of the mine. Neutralization of floating or moored mines involve the diver placing a specific amount of explosives directly on the mine. Harbor clearance activities involve the diver placing a specific amount of explosives on underwater structures in order to clear these structures from their current position in the water column, or to perform underwater cutting, shearing, cratering, and venting when other tools are inappropriate.

Location—The activities for this exercise took place offshore in the Pu‘uloa Underwater Range (called Keahi Point in prior RIMPAC Environmental Assessments), Pearl Harbor (Danger Zone 334.1370).

Duration—Each demolition activity generally lasts 1 to 4 hours.

Standard Operating Procedures—All demolition activities are conducted in accordance with Commander Naval Surface Forces Pacific (COMNAVSURFPAC) Instruction 3120.8D, Procedures for Disposal of Explosives at Sea/Firing of Depth Charges and Other Underwater Ordnance (Department of the Navy, 1993). Before any explosive is detonated, divers are transported a safe distance away from the explosive and a thorough search is made of the area to identify marine mammals or sea turtles. If any are seen, the exercise is delayed until the animals leave the area. Specifically, all mitigation measures as described in the MMPA Letter of Authorization and Hawaii Range Complex Environmental Impact Statement (EIS) are followed. Standard practices for tethered mines in Hawaiian waters require mine neutralization charges to be suspended 3 meters (10 feet) below the surface of the water. For mines on the shallow water floor (less than 40 feet of water), only sandy areas that avoid/minimize potential impacts to coral would be used for explosive charges.

2. METHODS

2.1 PARTICIPANTS AND LOCATION

Navy marine species observers

- Robert Uyeyama – Naval Facilities Engineering Command Pacific (NAVFAC PAC) – 19 & 26 October 2011
- Meredith Fagan – Naval Facilities Engineering Command Pacific (NAVFAC PAC) – 19 October 2011
- LCDR Lee Shannon, USNR – Naval Facilities Engineering Service Center (NAVFAC ESC) – 26 October & 2 November 2011
- Thad Kanegawa– Naval Facilities Engineering Command Pacific (NAVFAC PAC) – 19 October 2011

Naval Dive Team
US Navy - Mobile Diving Salvage Unit ONE (MDSU-1)

Vessels Involved in UNDET exercise

- 2 X RHIB ~24 ft
- 1 X 27 ft Boston Whaler - (Carrying three Navy MDSU-1 personnel and Navy biologist MMOs)

Location
Pu‘uloa Underwater Range (Danger Zone 334.1370)

Dates and number of shots - Total: Seven (7)

- 19 October 2011 – Two (2) UNDETs
- 26 October 2011 – Two (2) UNDETs
- 2 November 2011 – Three (3) UNDETs

2.2 Description

MMO monitoring was conducted from a shipboard platform that accompanied the exercises on site at the Pu‘uloa Underwater Range (Danger Zone 334.1370). Monitoring occurred on: 19 October, 26 October,

and 2 November 2011. For all days, a 27' Boston Whaler dedicated to the monitoring effort was provided and piloted by personnel of Mobile Diving Salvage Unit ONE (MDSU-1) (Fig. 1).

As listed above in section 2.1, three MMOs were on board the monitoring vessel on 19 October, two MMOs were present on 26 October, and one MMO was present on 2 November. The MMOs present on the 19 and 26 October dates were equipped with 7x50 binoculars, a Canon camera with 200mm zoom lens, and access to VHF communications with the other boats. On 2 November, the MMO was not equipped with a camera or binoculars, but had VHF access as previously; for both 26 October and 2 November, an MMO attempted to make underwater acoustic recordings of the UNDET events to collect data on ambient sound levels before and after detonations. One MMO served the data recorder as well as a secondary observer, and was equipped with data entry sheets (Table 1), a clipboard and a handheld chart-plotting marine GPS unit. The MMOs were on effort throughout the duration of the day, from the time of the vessel leaving the dock, until its return. All sightings by MMOs and Navy lookouts were recorded, as well as whether mitigation measures were followed. Monitoring surveys from other platforms (e.g., aerial) were not conducted for these UNDET monitoring efforts.

Figure 1. 27' Boston Whaler utilized by the MMOs

3. RESULTS

3.1 MONITORING SUMMARY

MDSU-1 performed two underwater detonation (UNDET) events on 19 October 2011, two events on 26 October 2011, and three events on 2 November 2011, for a total of seven events, at the Pu‘uloa Underwater Range (Danger Zone 334.1370), approximately 1.7 nm from Keahi Point located west of the Pearl Harbor entrance channel. The intent of the exercises was to provide training for underwater demolition. The bottom depth of the detonation training locations was approximately 20 m (60 fsw).

The net explosive weight (NEW) and approximate location of these events were:
19 October: 13 lbs and 17 lbs at N 21º 17' 4.30", W 157º 59' 3.45"
26 October: 2.5 lbs and 2.5 lbs 21 º 17' 24.90", W 159º 59' 22.49"
02 November: 12.5 lbs, 12.5 lbs, and 5.0 lbs. N 21º 17' 49.92", W 157º 59' 23.16"

On all days, a total of 3 boats participated: 2 RHIBs, as well as the Boston Whaler that was dedicated to the monitoring effort (Fig. 1), that carried the Navy biologist observer(s) in addition two three MDSU-1 personnel. These three days of exercises are described individually in more detail below. A summary of sightings for all three days is given in Table 1.

Table 1. Sightings summary: 19 October, 26 October, and 02 November 2011

	Date	Time (HST)	Species	Group size (min/max/best)	Vessel location
1	19 Oct 2011	09:07:54	*Chelonia mydas*	1/1/1	N 21.29783º W 157.95694º *
2	19 Oct 2011	09:33:00	*Chelonia mydas*	1/1/1	N 21.28756º W 157.98874º
3	19 Oct 2011	10:55:36	*Monachus schauinslandi*	1/1/1	N 21.28377 º W -157.98865 º
-	26 Oct 2011	-	*(no sightings)*	-	-
4	02 Nov 2011	~10:10	*Chelonia mydas*	2/2/2	N 21.29783º W 157.95694º *

** Approximate coordinates of Pearl Harbor buoy 1; sighting reported in the vicinity of buoys 1 & 2.*

3.2 DESCRIPTION OF ACTIVITY

3.2.1 UNDETs of 19 October 2011

The intent of the exercises was to provide training and qualifications for underwater demolition. The monitoring vessel was one of three vessels at the training location, the other two being ~24 ft RHIBs operated by MDSU-1. Two underwater explosive events were monitored on this day. Both UNDET locations on this day were at the Pu‘uloa Underwater Range at approximately 21º 17' 4.30" N 157º 59' 3.45" W (Fig. 2).

EVENT ONE (NEW 13.0 lbs): The monitoring vessel departed the dock within Pearl Harbor at 08:59 HST. While transiting the harbor entrance at 09:08, a green sea turtle (*Chelonia mydas)* was spotted in the vicinity of the Pearl Harbor entrance channel buoys 1 and 2, at N 21.29783º, W 157.95694º, approximately 15 º off the starboard bow (relative bearing 015) at a distance of ~4 m. This sighting was outside the mitigation area. The vessel arrived at the training location at 09:13, where sighting conditions were excellent; sea state was Beaufort 1 with swell less than 1/3 m, and cloud cover was ~20%. This time point marked the beginning of the 30 minute pre-detonation visual survey period.

As in previous UNDET monitoring, the two RHIBs conducting the exercise were observed to alternate between preparing the detonation location and conducting a visual survey around a perimeter of radius 250-500m. The monitoring vessel’s mission was to observe and monitor the mitigation measures conducted by MDSU-1. Opportunistically, the monitoring vessel also conducted a visual survey, at approximately 300-400m distance, with MMOs looking to both starboard and port sides to view the full mitigation range of 700 yds, in order to support these monitoring activities.

At 09:33, a green sea turtle was sighted approximately 15º off the port bow (relative bearing 345) at a distance of ~20 m at N21.28756º W157.98874º. This sighting was within the mitigation area, and the 30 minute pre-detonation period was restarted at this time.

The perimeter survey was continued and the animal was not resighted. No other marine mammal or sea

turtle sightings were made, and the detonation occurred at 10:09. The plume above the surface (Fig. 3) is primarily due to the explosion of the detonation cord component of the explosives package, which leads downward vertically from the surface through the water column. The detonation method was electric (Mk-186), and the divers reported the depth to be 60 fsw and the bottom type to be sand. The post-exercise mitigation survey began at this time. The monitoring vessel examined the plume area, where stunned fish were observed at the surface (Fig. 4), and estimated to number approximately 60 (min: 40, max: 80). This observation was different than in previous UNDET monitoring conducted in 2010 and 2011, where no dead or stunned fish were observed, with the exception of one event where a single stunned fish was observed. The exercise participants were observed collecting the larger extended pieces of bubble wrap material from the surface of the water by hand. The remainder of the post-exercise mitigation survey utilized the same circular perimeter search pattern, and also served as the pre-exercise survey for event two, as described below.

Figure 2. UNDET monitoring of 19 October 2011. The boundaries of the Pu‘uloa Underwater Range are marked by the yellow square. Monitoring vessel track shown in pink; estimated UNDET location for both events this day is indicated by the red pushpin icon at N 21º 17' 4.30", W 157º 59' 3.45". The entrance to Pearl Harbor is at top. Sightings key: CHEMY=*Chelonia mydas*; MONSC=*Monachus schauinlandi*

Figure 3. UNDET event one on 19 October 2011, 10:09 am, 13.0 lbs NEW. The visible plume is a result of the detonation cord component of the explosives at the surface

Figure 4. Stunned fish observed at surface after event one of 19 October 2011

EVENT TWO (NEW 17.0 lbs): The post-exercise survey for event one also served as the pre-exercise survey for event two, and began at 10:09, the time of the detonation of event one. During this survey period at 10:30, one of the two MDSU vessels reported sighting a seal via radio communications. The monitoring vessel immediately broke off from its perimeter survey to move directly towards the vessel that had reported the sighting; their crew indicated a general direction in which the animal had been sighted a few hundred yards away. The monitoring vessel moved in the indicated direction and distance, then stopped its engines and initiated a 360 degree search around the vessel. At 10:55:36 the animal was sighted by the MMO team ~95 º to starboard at ~150 yards away from their vessel at N21.28377º W157.98865º, and confirmed to be a Hawaiian monk seal (*Monachus schauinslandi*); due to the relative small sighting cue of this species, the prevailing very calm sighting conditions contributed to the ability to make this sighting. The seal appeared to be slowly moving at the surface, and was therefore visually

available almost continuously. The mitigation vessel and monitoring vessel approached to within ~20 yards with the intent of enabling optimal observation of the animal between surfacings until it was confirmed to have departed the mitigation zone. At this time, the seal's location was confirmed by the exercise participants to be within mitigation range at ~294 yds (269m) from the detonation location (Fig. 5).

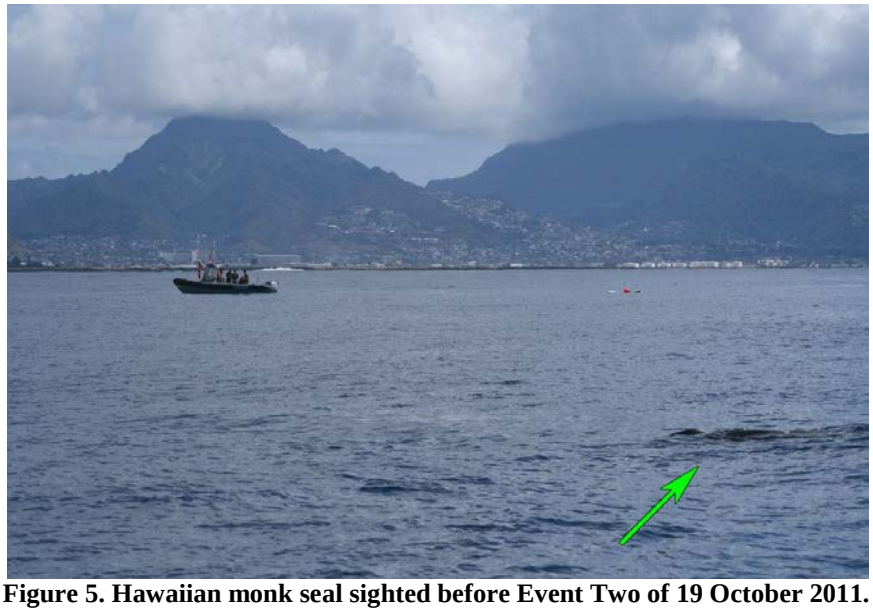

Figure 5. Hawaiian monk seal sighted before Event Two of 19 October 2011. The time of the sighting is 10:56:54. The monk seal is visible at bottom right (marked by arrow). The MDSU vessel at top left is preparing the detonation at the site marked by the buoys to the right. The distance between the seal and detonation location is approximately 294 yds.

As the monitoring vessel approached, it became clear that the animal was splashing at the surface and successively throwing, then attempting to swallow a large fish, approximately 16" long (Fig. 6). This activity continued for several minutes, during the course of which the seal partially swallowed (Fig. 7), then retracted the fish from its throat (Fig. 8), threw the fish into the water (Fig. 9) and attempted to swallow it again. Eventually it was successful (Fig. 10), after which the seal immediately disappeared beneath the water (Fig. 11), its first extended dive since being sighted by the monitoring boat. Since this location was within the mitigation zone, and although an underwater search is not a required mitigation measure, a Navy diver was deployed to snorkel to visually scan underwater where the seal was last seen, and confirmed that it was no longer visible in this location (Fig. 12). It was resighted at 11:04 approximately 65m to the northwest (N21.28405 º W157.98705 º) at an approximate distance of 318 yds (291 m) from the detonation site, when it surfaced briefly and appeared to be traveling away from the detonation site toward the northwest (Fig. 13). At this time the seastate had reached a Beaufort 3. The MMO vessel remained stationary at this location searching for the monk seal, as this method was judged more likely to resight the animal over resuming a circular perimeter survey.

The seal was not sighted again, nor were any other marine mammals or sea turtles, and the second detonation occurred at 11:40 (Fig. 14). At this time the sea state was a Beaufort 4. The detonation method was electric (Mk-186), and the divers reported the depth to be 60 fsw and the bottom type to be sand. During the entire course of its observation described above, the animal was not observed to exhibit any behaviors indicating reaction to the presence of the observing vessels.

The post-exercise mitigation survey began at 11:40, beginning with an inspection of the plume area generated by the explosion gases, where stunned fish were observed at the surface and estimated to number approximately 10 (min: 5, max: 20). The exercise participants were observed to collect the large pieces of expended bubble wrap material from the surface of the water by hand (Fig. 15). The MMO

vessel subsequently conducted a visual survey with a circular radius of 300-400m for 30 minutes, then departed the range, and returned to port at 12:25. No sea turtles or marine mammals were sighted during the visual survey nor return to port. Total monitoring time across both events was 3 hours 26 minutes.

Figure 6. The Hawaiian monk seal was sighted with a fish at the surface

Figure 7. Attempting to swallow the fish

Figure 8. Retracting the fish after an apparent attempt to swallow it

Figure 9. The Hawaiian monk seal threw the fish after retracting it from its initial attempt to swallow it

Figure 10. Successful swallowing attempt

Figure 11. The Hawaiian monk seal submerged after swallowing the fish

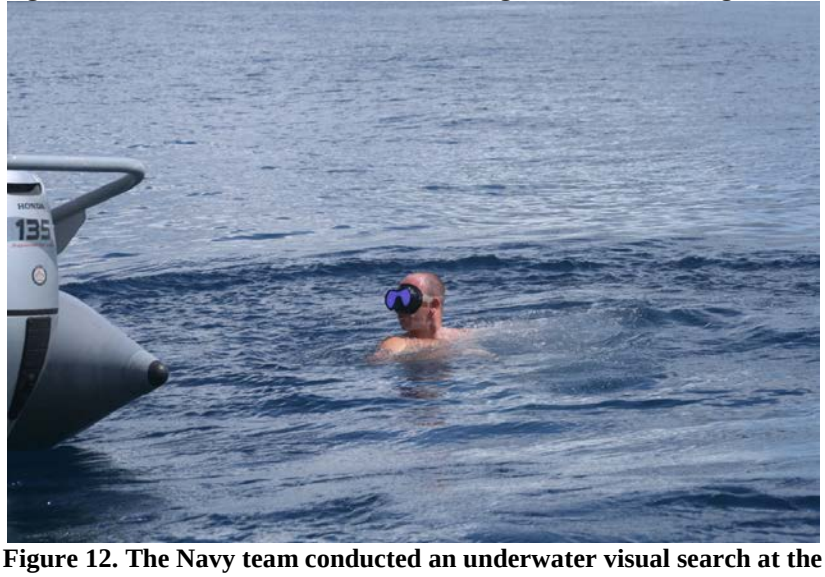

Figure 12. The Navy team conducted an underwater visual search at the site of the last sighting location of the seal

Figure 13. The last sighting on 19 October 2011, 11:04 am. This location is approximately 65m to the northwest of the animal's last sighting in Fig. 10 when it submerged after swallowing a fish at the surface. The distance between the seal and detonation location at this time was 318 yds, and the seal appeared to be swimming away from the detonation location toward the northwest.

Figure 14. UNDET event two on 19 October 2011, 11:40 am, 17.0 lbs NEW. The visible plume is a result of the detonation cord component of the explosives at the surface

Figure 15. Exercise participants collecting expended bubble wrap from water surface after detonation.

3.2.2 UNDETs of 26 October 2011

As during the previous day, the purpose of the exercises was to provide training and qualifications for underwater demolition. The monitoring vessel was one of three vessels at the training location, the other two being ~24 ft RHIBs operated by MDSU-1. Two underwater explosive events were monitored on this day. As a pilot study, a MMO from NAVFAC ESC also studied the feasibility of using a dipping hydrophone to take recordings of the underwater detonation events from the MMO vessel platform. No sightings of sea turtles or marine mammals were seen during monitoring on this day.

Both UNDET locations on this day were within the Pu‘uloa Underwater Range at approximately 21º 17' 24.90" N 159º 59' 22.49" W (Fig. 16).

EVENT ONE (NEW 2.5 lbs):
The monitoring vessel departed the dock within Pearl Harbor at 09:16 HST, approximately 5-10 minutes after the MDSU vessels participating in the exercise had departed. No sightings of sea turtles or marine mammals were made during transit to the detonation location. The pre-detonation survey began at 09:30. Sea state was Beaufort 3, with a 1-3 ft. swell and 20% cloud cover.

As in previous UNDET monitoring, the two RHIBs conducting the exercise were observed to alternate between preparing the detonation location and conducting a visual survey around a perimeter of radius 250-500m. The monitoring vessel’s mission was to observe and monitor the mitigation measures conducted by MDSU-1. Opportunistically, the monitoring vessel also conducted a visual survey, at approximately 300-400m distance, with MMOs looking to both starboard and port sides to view the full mitigation range of 700 yds, in order to support these monitoring activities.

No sightings of sea turtles or marine mammals were made by the monitoring vessel or the exercise participants, although one exercise vessel was observed to vector toward an encroaching civilian vessel in order to clear it from the range. At 09:59 a five-minute pre-detonation announcement was given to the monitoring vessel, at which time the hydrophone was deployed after placing the vessel into neutral. The detonation occurred at 10:04:41 (Fig. 17), with a NEW of 2.5 lbs. The exercise participants were observed to collect the large pieces of expended bubble wrap from the surface of the water by hand. The monitoring vessel remained in neutral for five additional minutes to continue to record the post-detonation period. The post-exercise mitigation survey utilized the same circular perimeter search pattern, and also served as the pre-exercise survey for event two, and is described below.

EVENT TWO (NEW 2.5 lbs):
The post-exercise survey for event one also served as the pre-exercise survey for event two, and began at 10:04:41, the time of the detonation of event one. Sea state remained Beaufort 3, with a 1-3 ft. swell and 20% cloud cover. The two RHIBs conducting the exercise were observed to alternate between preparing the detonation location and conducting a visual survey around a perimeter of radius 250-500m, as they had done for event one. After finishing the 5-minute post-detonation audio recording, the monitoring vessel also conducted a similar visual survey to support its monitoring activities, at approximately 300-400m distance, with MMOs looking to both starboard and port sides to view the full mitigation range of 700 yds. No sightings of sea turtles or marine mammals were made by the exercise participants or the monitoring vessel. The detonation occurred at 10:39:56 (Fig. 18). The exercise participants were observed to collect the large pieces of expended bubble wrap from the surface of the water by hand. The post-exercise mitigation survey utilized the same circular perimeter pattern, and continued for 30 minutes. The MMO’s vessel departed the area and exited mitigation range at 11:06, and returned to port at 11:21:55. No sea turtles or marine mammals were sighted during the return to port. The total time

spent monitoring on this day across both events was 2 hours 5 minutes.

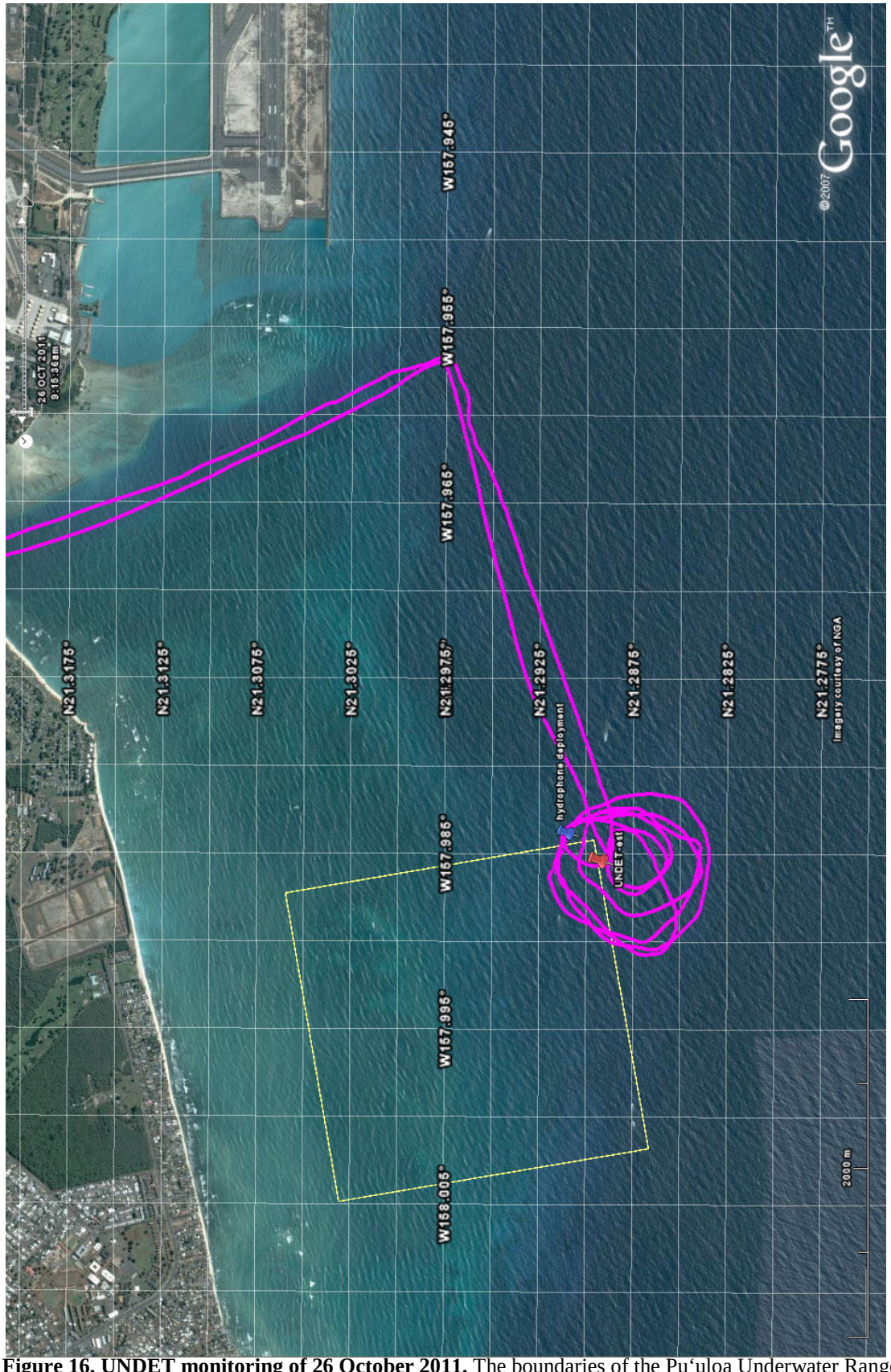

Figure 16. UNDET monitoring of 26 October 2011. The boundaries of the Pu‘uloa Underwater Range are marked by the yellow square. Monitoring vessel track shown in pink; estimated UNDET location indicated by red pushpin icon at 21º 17' 24.90", W 159º 59' 22.49". The entrance to Pearl Harbor is at top. Hydrophone deployment is also shown. No animals were sighted.

Figure 17. UNDET event two on 26 October 2011, 10:04 am, 2.5 lbs NEW. The visible plume is a result of the detonation cord component of the explosives at the surface.

Figure 18. UNDET event two on 26 October 2011, 10:40 am, 2.5 lbs NEW. The visible plume is a result of the detonation cord component of the explosives at the surface.

3.2.3 UNDETs of 02 November 2011

Three underwater explosive events were monitored by one MMO on this day. All UNDET locations on this day were within the Pu‘uloa Underwater Range at approximately 21º 17' 49.92" N 157º 59' 23.16" W, which the divers reported to have a depth of 35 ft. and a bottom type of “flat sand” (Fig. 19). All three devices were remotely triggered by the MK 67 radio-controlled command detonation. As a continuation of a pilot study, a MMO studied the feasibility of utilizing a dipping hydrophone to take recordings of the underwater detonation events from the MMO vessel platform for all three detonations.

The intent of the exercises was to provide training and qualifications for underwater demolition using a remote detonation initiation method. The monitoring vessel was one of three vessels at the training location, the other two being ~24 ft RHIBs operated by MDSU-1. During the outbound transit to the exercise location, the monitoring vessel sighted two green sea turtles (*Chelonia mydas*) in the vicinity of the Pearl Harbor entrance channel buoys 1, at N 21.29783º, W 157.95694º, well outside the mitigation range.

A GPS device was not used to record vessel tracks for monitoring on this day. However as in previous UNDET monitoring, the two RHIBs conducting the exercise were observed to alternate between preparing the detonation location and conducting a visual survey around a perimeter of radius 250-500m. The exercise participants were observed to have conducted a visual survey for at least 30 minutes both before and after each of the three events. The post-event survey for Event One also served as the pre-event survey Event Two; similarly the post-event survey for Event Two served as the pre-event survey for Event Three.

The times and explosive weights for each detonation is given below, as well as the position of the monitoring vessel, approximately 500-800 yds from the detonation location.

Event One: 10:50 am HST, NEW 12.5 lbs., MMO vessel location 21º N 17.607', 157º W 59.888'
Event Two: 11:29 am HST, NEW 12.5 lbs. MMO vessel location 21º N 17.797', 157º W 59.734'
Event Three: 12:05 pm HST, NEW 5.0 lbs. MMO vessel location 21º N 17.728', 157º W 59.703'

Other than the sea turtle sighting on the outbound transit, no sightings of sea turtles or marine mammals were seen during monitoring on this day during the visual surveys on the range, nor on the return transit to port in Pearl Harbor.

Figure 19. UNDET monitoring of 02 November 2011. The boundaries of the Pu‘uloa Underwater Range are marked by the yellow square. UNDET location indicated by red pushpin icon at N 21º 17' 49.92", W 157º 59' 23.16". The location of the MMO vessel at the time of each detonation event is indicated by the yellow pushpin icons. The entrance to Pearl Harbor is at top. No animals were sighted.

4. CONCLUSIONS

MDSU-1 was cooperative and instrumental with the coordination of placing MMOs on board for monitoring the UNDET events. In general, the UNDET training requires Navy divers to be vigilant with a number of safety considerations, not only for the environment, but for the personnel on board and civilians in the vicinity. They knew the mitigation requirements well and followed them as described in the MMPA Letter of Authorization and Hawaii Range Complex EIS. The MMO time spent with the Navy divers help foster the understanding of why these mitigation measures are in place and the importance of these measures for protecting marine life and enabling Navy training. Protocols for the coordination of future UNDET monitoring efforts were also clarified.

The pilot study of making digital underwater recordings with a dipping hydrophone during UNDET exercises was conducted on both October 26 and November 2. On both days, the recording was begun 1-2 minutes prior to each detonation, and continued for 2-5 minutes afterwards. These data will contribute to a corpus of information on relative changes in ambient sound after detonations, to be analyzed at later time. As expected, because ambient sound was the primary motivation behind the recordings, the recording gain was set such that the actual detonation impulses saturated the recording device and were clipped, such that a measurement of SPL (sound pressure level) was not possible.

The monitoring of 19 October 2011 represents the first time that a Hawaiian monk seal was sighted during UNDET monitoring efforts. Due to the relatively small size of the visual cue for monk seals, the calm sea state at the beginning of the exercise, and the fact that the animal was surface-active, facilitated the sightings of this animal. As sea state conditions became rougher, the animal had already been observed to have been moving away from the site. It is worth noting that it was the exercise participants, rather than the MMO team, that made the initial sighting of this animal, so it is likely that any monk seals at relatively close range in similar conditions would be likely to be spotted in future exercises. Also the MMO vessel halted its circular survey pattern in order to dedicate its search pattern to reacquiring then remaining with the monk seal, in contrast to past monitoring protocol when the search pattern continued after sea turtles were sighted. The exercise participants also opted to conduct an underwater search after the animal departed. The photographs of the monk seal eating the fish were delivered to the monk seal division at the NMFS Pacific Island Fisheries Science Center (PIFSC), as well as to the Waikiki Aquarium. The fish was tentatively identified to species by the Aquarium as *Monotaxis grandoculis* (bigeye emperor; Hawaiian: *mu*). This tentative information was also provided to PIFSC in their efforts to make a final species identification; at the time of this writing, the result has not been provided to the authors of this report. The identification of the fish was of interest with regard to furthering knowledge of prey species for monk seals resident in the Main Hawaiian Islands. PIFSC positively identified the monk seal from natural markings as the individual “RH58,” which had been sighted prior to the exercise nearby off Iroquois Point, and was subsequently sighted by at various locations on the south shore of Oahu.

5. ACKNOWLEDGEMENTS

We thank the officers and crew of MDSU-1, including but not limited to CWO3 Chris Lehner, CWO3 Jason Kypros, NDCS Richard Stafford, and the personnel of Companies 1-5 and 1-8 for their outstanding support and hospitality during this monitoring effort.