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Trip Report, FIREX Marine Mammal Monitoring Jacksonville Range Complex

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List of Acronyms and Abbreviations

CO	Commanding Officer
ft	feet
EST	Eastern Standard Time
FIREX	Firing Exercise
IMPASS	Integrated Maritime Portable Acoustic Scoring
JAX	Jacksonville Range Complex
km	kilometers
kts	knots (nautical miles per hour)
MMO	Marine Mammal Observer
nm	nautical miles
NMFS	National Marine Fisheries Service
PMAP	Protective Measures Assessment Protocol
XO	Executive Officer
yd(s)	yards

SECTION 1: INTRODUCTION

In order to train with explosives, the Navy must obtain a permit from the National Marine Fisheries Service (NMFS) under the Marine Mammal Protection Act and Endangered Species Act. The Jacksonville (JAX) Range Complex Monitoring Plans (DoN 2009), finalized in June 2009, was developed with NMFS to comply with the requirements under the permits obtained for explosives training (NMFS 2009).

The Jacksonville Range Complex Monitoring Plan is one component of the overall effort the Navy is undertaking to understand its potential effects and the biological consequences of those effects to protected marine species. The Jacksonville Range Complex Monitoring Plan has been designed as a collection of focused “studies” to gather data that will allow the Navy to address the following questions:

1. What are the behavioral responses of marine mammals and sea turtles that are exposed to explosives at specific levels?
2. Is the Navy’s suite of mitigation measures for explosives (e.g., PMAP, major exercise measures agreed to by the Navy through permitting) effective at avoiding TTS, injury, and mortality of marine mammals and sea turtles?

In order to answer these questions, data is to be collected through various means, including contracted vessel and aerial surveys, passive acoustics, and placing marine mammal observers (MMOs) aboard Navy assets.

As part of this data collection effort, three U.S. Navy MMOs (Ms. Sarah Bellau, Mr. Tom Vars, and Mr. Scott Haga) participated in a FIREX w/IMPASS exercise on October 5-6. These MMOs were stationed aboard the *USS GETTYSBURG* (CG 64). The primary goal of the FIREX monitoring effort was to collect data on marine mammals observed during operations and to answer the follow questions:

1. Are marine mammals and sea turtles exposed to explosives?
2. If so, at what levels?
3. Did exposed marine mammals/sea turtles show a behavioral response?

A secondary goal for the monitoring was to familiarize the MMOs with at-sea Navy operations and to gather information to facilitate future MMO opportunities. This secondary goal is captured as “lessons learned” in Section 5.2.

SECTION 2: FIREX WITH IMPASS DESCRIPTION

A FIREX involves bombardment of a target within an impact area by one or more ships. The scenario is as follows: the IMPASS (Integrated Maritime Portable Acoustic Scoring and Simulation System) is deployed by the firing ship and consists of five sonobuoys set in a pentagon-shaped arrangement at 1.3 km intervals. Within the ship’s combat system, the training system creates a virtual land mass that overlays the array and simulates land targets. The ship then positions itself about 4 to 5 nm from the target area. The ship fires its ordnance into the

target area; the sonobuoys detect the bearing to the acoustic noise resulting from the impact of a round landing in the water, and then transmit their GPS position and their bearing information to the ship. From the impact location data collected, the training system computer triangulates the exact point of impact of the round and, from that data, the exercise may be conducted as if the ship were firing at an actual land target. When the training is complete, the IMPASS buoy system is recovered by the ship.

SECTION 3: METHODS

3.1. SHIPBOARD MARINE MAMMAL MONITORING

MMO surveys were conducted on a not-to-interfere basis, which means that the MMOs would not replace required Navy lookouts, would not dictate operational requirements/maneuvers, and would remove themselves from the bridge wing if necessary for the *USS GETTYSBURG* to accomplish its mission objectives. The only exception would be if a marine mammal was sighted by the MMO within the shut-down zone during the explosive event (within 700 yds of the target for FIREX with IMPASS event) and was not sighted by the lookout, the MMO would report the sighting to the lookout for appropriate reporting and action.

The MMO survey was conducted on the bridge wing of the *USS GETTYSBURG* (62 feet [ft] above water's surface), with one MMO on each wing. During on-effort surveys, the MMOs would use the naked eye and 7X50 powered binoculars to scan the area from dead ahead to just abaft of the beam. In searching this area, the MMOs would start at the forward part of the sector and search aft. Binoculars were held so that the horizon was in the top third of the field of view. The field of view was scanned from the horizon towards the ship. Once the field of view was scanned, the binoculars were repositioned and the field of view was scanned again (Figure 1). Once the scan with the binoculars was completed, the eyes were rested for a few seconds and the entire sector was scanned with the naked eye.

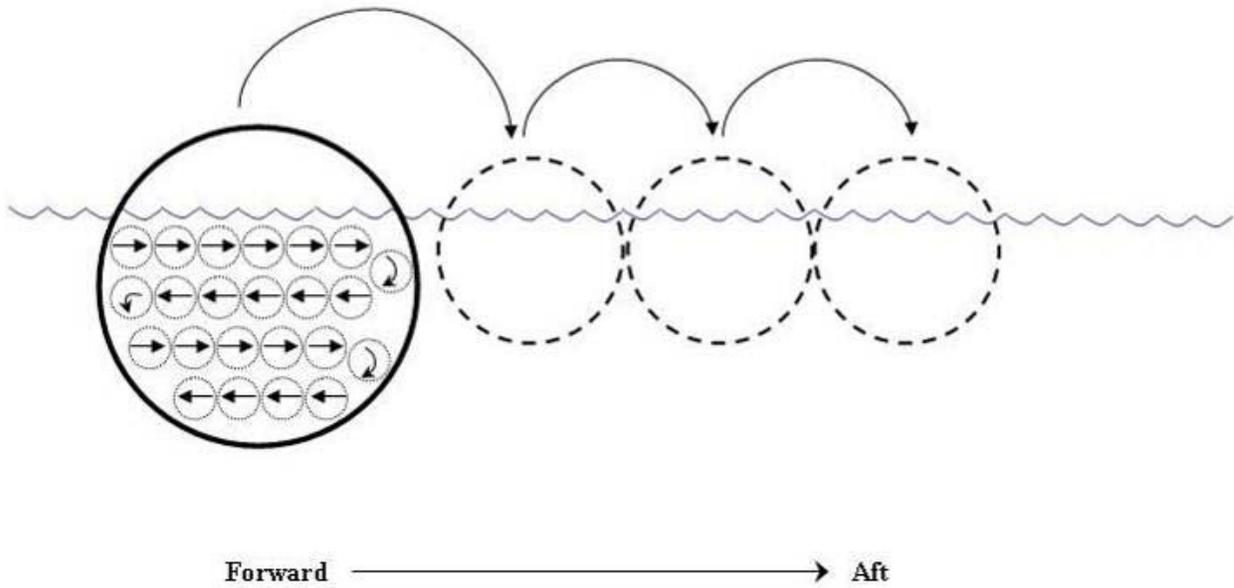


Figure 1. MMO Surface Searching Procedure

When an animal was visually detected the MMO would collect information on twenty-three sighting, environmental, and sonar parameters (Table 1). When practical, still photography was obtained by the MMO.

Table 1. Shipboard MMO Data Category Descriptions

Data Category	Description
Sightings Information	
Effort (on/off)	On effort means actively searching for marine mammals; time spent off effort could result from vacating the bridge wing for operational reasons.
Date	Format in mm/dd/yy.
Time	Time provided in Eastern Standard Time (EST).
Location	This is the location of the vessel at the time of the sighting, provided by monitors on the bridge.
Detection Sensor	Either visual or aural (if detected passively by the sonar technician) and which MMO observed the animal.
Species/Group	Determined by the MMO.
Group Size	Estimated by the MMO.
# Calves	Estimated by the MMO.
Bearing (true)	Estimated by the MMO.
Distance (yds)	Estimated by the MMO using reticled binoculars.
Length of contact	Estimated by the MMO.
Environmental Information	
Wave height (ft)	Estimated by the MMO.
Visibility	Estimated by the MMO.
BSS	Estimated by the MMO.
Swell direction (true)	Estimated by the MMO.
Wind direction (true)	Estimated by the MMO.
% glare	Estimated by the MMO.
% cloud cover	Estimated by the MMO.
Operational Information	
Active sonar in use?	Specifically refers to MFAS.
Explosives in use?	This refers to whether an explosive event occurred within the monitoring rotation, not necessarily whether an explosion occurred at the specific time of the sighting.
Direction of ship travel	Provided by monitors on the bridge.
Animal motion	Estimated by the MMO.
Behavior	<u>Individual behaviors:</u> breach, porpoise, spin, bowride, feeding, head slap, social, tail slap, pectoral fin slap, other <u>Whale behaviors:</u> blow, no blow rise, fluke up, peduncle arch, unidentified large splash <u>Group behaviors:</u> rest, mill, travel, surface active travel, surface active mill
Mitigation implemented	If explosives in use, the measures implemented, if any, by the vessel.
Comments	Other comments as necessary.

3.2. SCHEDULE OF EVENTS

USS GETTYSBURG departed Mayport, Florida, on 5 October at approximately 1500 Eastern Standard Time (EST). A FIREX with IMPASS using the 5 inch guns (bow and stern) was conducted on 6 October, followed by the ship returning to Mayport. A detailed schedule of events is provided below in Table 2.

Table 2. Schedule of Events

5 October		6 October	
Time	Notes	Time	Notes
1500	USS GETTYSBURG underway	0800	MMOs on effort
1517	MMOs on effort	0800	Buoy deployment begins
1815	MMOs off effort	0842	Buoy deployment completed
1300	MMOs on effort	0915	FIREX begins
1730	MMOs off effort	1150	MMOs off effort
		1247	MMOs on effort
		1425	FIREX ends
		1500	MMOs off effort
		1510	Buoy recovery begins
		1555	Buoy recovery completed

7 October	
Time	Notes
0700	USS GETTYSBURG returned to port

SECTION 4: RESULTS

One marine mammal sighting, of a bottlenose dolphin, was recorded by the MMOs (Table 3). The sighting as well as the approximate detonation location is shown on Figure 2.

Table 3. Marine Species Sightings Data

Data Category	Sighting 1
Sightings Information	
Effort (on/off)	on
Date	10/06/10
Time	0958
Location	30°41.146'N 80°27.308'W
Detection Sensor	MMO (Bellau)
Species/Group	Bottlenose dolphin
Group Size	1
# Calves	0
Bearing (true)	95°
Distance (yds)	68
Length of contact	?
Environmental Information	
Wave height (ft)	4-6
Visibility	unrestricted
BSS	4
Swell direction (true)	From NE
Wind direction (true)	NE
% glare	50%
% cloud cover	20%
Operational Information	
Active sonar in use?	no
Explosives in use?	Yes (see comments)
Direction of ship travel	180°
Animal motion	parallel
Behavior	traveling
Mitigation implemented	N/A
Comments	Animal was sighted while firing was not occurring. Sighting occurred on Starboard side of ship approx. 30 minutes prior to the 2 nd round of firing, and the area was clear when firing commenced again.

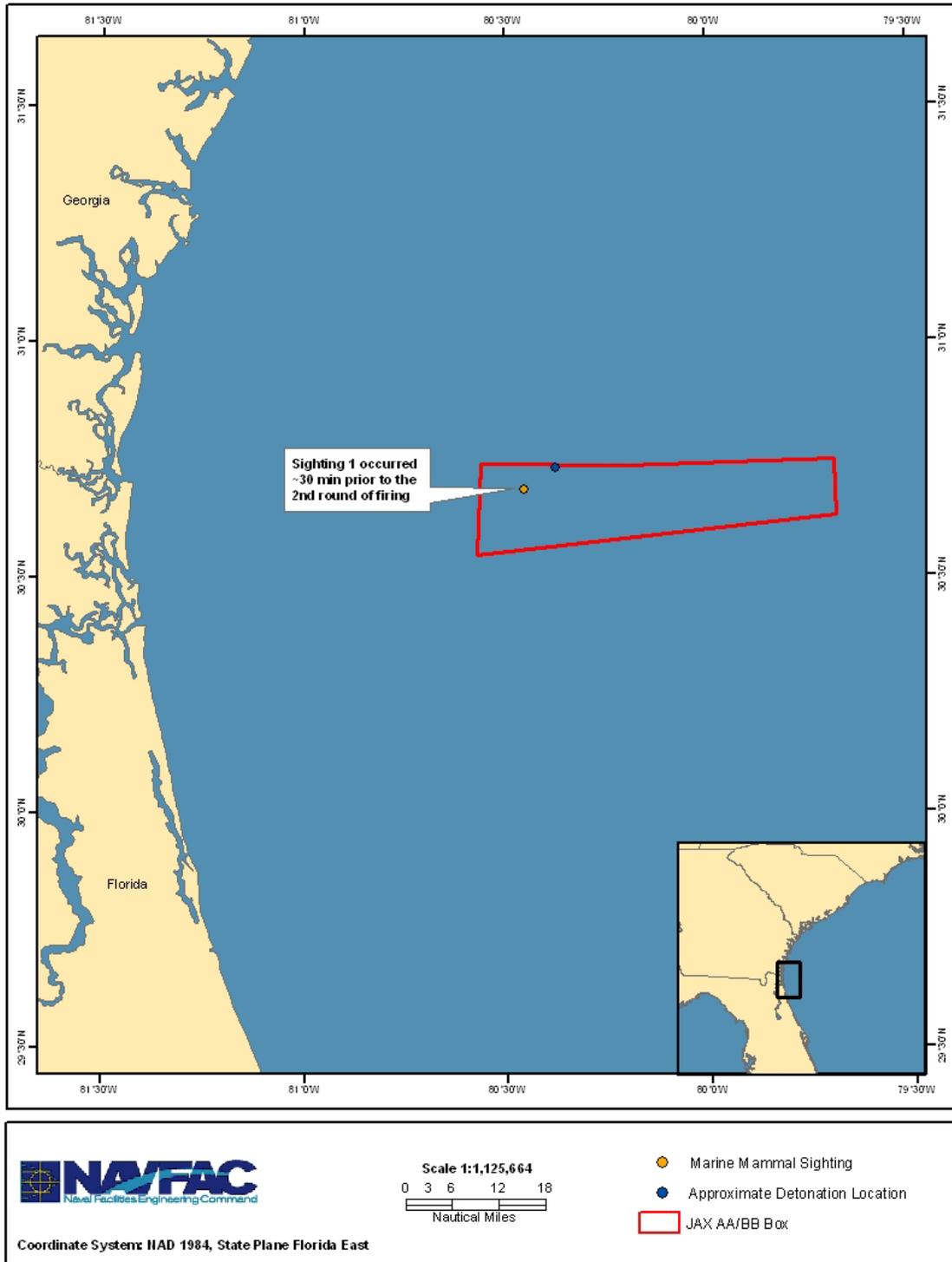


Figure 2. Marine Mammal Sighting and Approximate Detonation Location

SECTION 5: CONCLUSION

5.1. MARINE MAMMAL MONITORING

The goal of the FIREX monitoring effort is provided below, with a conclusion regarding each of the specific questions that were asked:

1. Are marine mammals and sea turtles exposed to explosives?

One marine mammal sighting was obtained by *USS GETTYSBURG* MMOs during the FIREX. The sighting occurred during a break between the 1st and 2nd round of firing and was estimated to be approximately 68 yds from the vessel. The sighting was very brief, and no unusual behavior was observed. The area was monitored for 30 minutes, but the animal was not seen again and was assumed to have moved out of the area. Since the animal was not seen for 30 minutes within the 70 yd mitigation zone, the 2nd round of firing commenced. No additional marine mammal or sea turtle sightings were obtained within the mitigation zones (within 600 yds of the detonation site or within 70 yds of the vessel) during the FIREX.

Due to the fact that no marine mammals or sea turtles were observed within the mitigation zones 30 minutes prior to or while gunfire occurred, there is no data to suggest that any animals were exposed to the event.

2. If so, at what levels?

Due to the fact that no marine mammals or sea turtles were observed within the mitigation zones 30 minutes prior to or while gunfire occurred, there is no data to suggest that any animals were exposed to the event.

3. Did exposed marine mammals/sea turtles show a behavioral response?

Due to the fact that no marine mammals or sea turtles were observed within the mitigation zones 30 minutes prior to or while gunfire occurred, there is no data to suggest that any animals were exposed to the event.

5.2. LESSONS LEARNED

A few lessons learned were noted for the FIREX event, and are separated into those for shipboard monitoring and operational information below.

5.2.1. Shipboard Marine Mammal Monitoring

- Methods are needed to continue to improve the close aboard distance estimation by MMOs. Reticled binoculars were used for longer distance sightings, however at a bridge height of 62 ft, this method was not useful for close aboard sightings. Suggest that MMOs practice close aboard distance estimation if possible.
- Previous MMO trips have only consisted of two Navy MMOs. For this trip, there were three Navy MMOs so that one could be a data recorder and the other two could observe. Having a third MMO as data recorder was very helpful in allowing the port and starboard MMOs on the bridge wings to focus on surveying for marine mammals and sea turtles. It is recommended, that a minimum of three MMOs go on all trips, if feasible.
- A GPS unit was used to try and gather ship track information and log sighting locations. However, the unit did not work inside the bridge due to loss of satellite connection. It is recommended that the GPS unit be checked at the beginning of the trip to ensure that it is logging data properly.

5.2.2. Operational Information

- MMOs attended the pre-sail brief, which eliminated confusion regarding timing and sequence of events. MMOs did not present during the brief; however, monitoring topics such as the MSAT training and Navy watchstanders were included in the official brief. It is recommended that this continue to be done in the future.
- Once MMOs embarked on the Navy ship, the Commanding Officer (CO) and Executive Officer (XO) were briefed on the specifics of the monitoring. This was done as soon as possible and eliminated confusion. MMOs explained the JAX MMPA and ESA permit requirements and importance of environmental compliance as rationale for the MMO embark. This information was received well by the CO and XO. It is recommended that a meeting with the XO and CO continue to be a priority shortly after boarding the ship.
- Coordination for this event went fairly smoothly and we were able to work out getting on the ship for the necessary time to complete the monitoring associated with the event. Need to continue to improve pre-planning coordination between operators and MMOs to ensure that monitoring opportunities and data gathering is maximized.

SECTION 6: ACKNOWLEDGEMENTS

We thank the officers and crew of the *USS GETTYSBURG* (CG 64) for their outstanding support and hospitality during this cruise and Mr. Dennis Emhoff (RCST) for pre-planning coordination.

SECTION 7: REFERENCES

DoN. 2009. Jacksonville Range Complex Monitoring Plan-Final 15 June 2009. Department of the Navy, Commander. U.S. Fleet Forces Command.

NMFS. 2009. Taking and Importing Marine Mammals; U.S. Navy Training in the Jacksonville Range Complex; Final Rule. June 15, 2009. 74FR28349.