

**FINAL**

**Occurrence, Distribution, and  
Density of Protected Marine  
Species in the Chesapeake Bay  
near NAS PAX:  
Annual Progress Report**

*Submitted to:*

Naval Facilities Engineering Command Atlantic under  
Contract No. N62470-10-D-3011, Task Order 055,  
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**Cover Photo Credit:**

Bottlenose dolphins (*Tursiops truncatus*). Photo taken by Todd Pusser under National Marine Fisheries Service permit no. 16239.

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## Acronyms and Abbreviations

m	meters
NAS	Naval Air Station
PAX	Patuxent
UNCW	University of North Carolina Wilmington
U.S.	United States

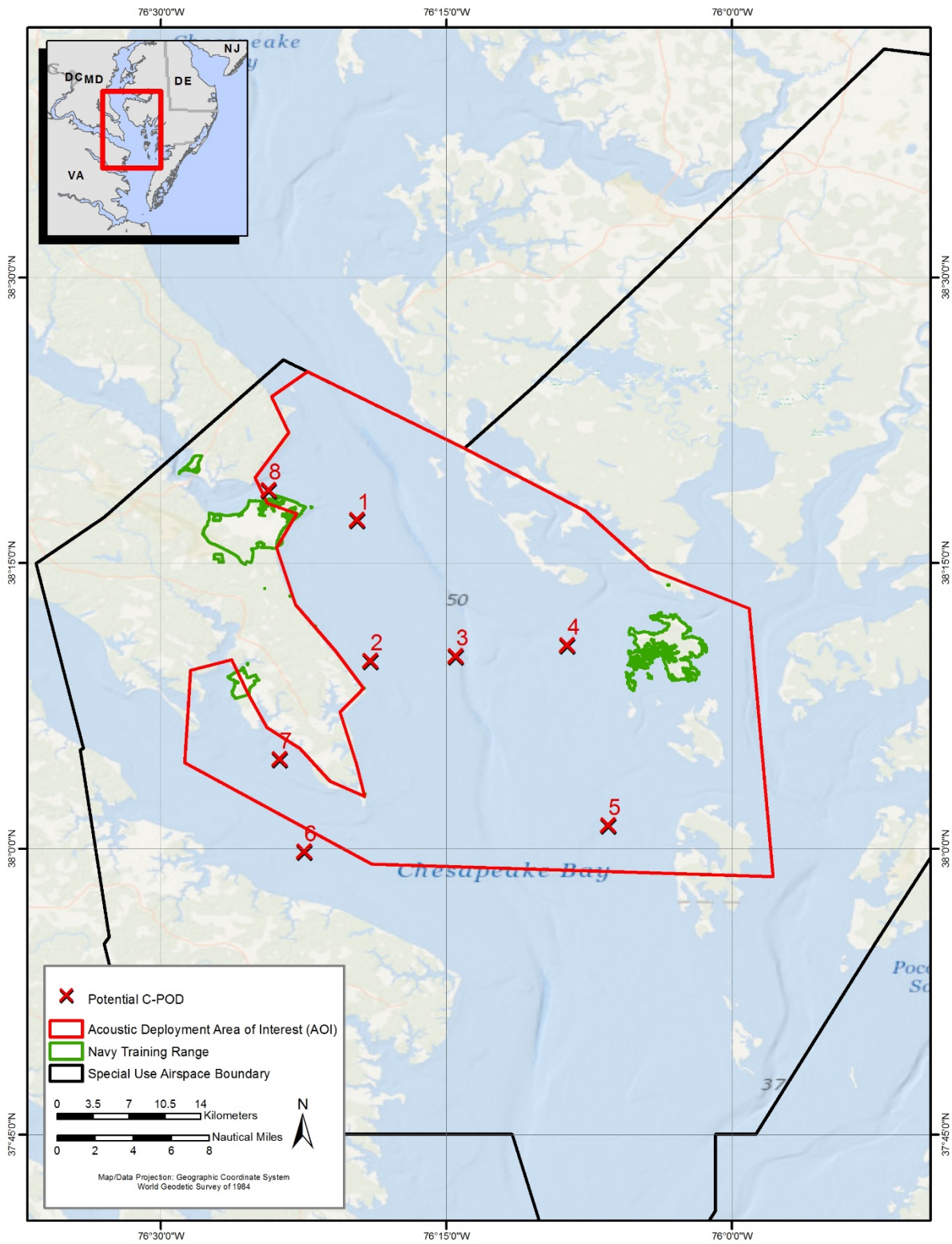
# 1. Background

The HDR Monitoring Team is tasked to initiate a monitoring project that will provide quantitative data and information on the seasonal occurrence, distribution, and density of protected species (marine mammals and sea turtles) in Chesapeake Bay waters near Naval Air Station (NAS) Patuxent (PAX) River, roughly from Drum Point, south to Smith Point along the western shore and over to the coastal waters of the eastern shore. An area of interest was determined during discussions with United States (U.S.) Navy Naval Air Systems Command (NAVAIR) personnel, for which more density and occurrence data for marine species was desired for use in environmental planning and regulatory compliance efforts. The University of North Carolina Wilmington (UNCW) will conduct monthly fixed-wing aerial line-transect surveys to document the occurrence and distribution of marine mammals and sea turtles in the study area. HDR will deploy C-PODs (passive acoustic data loggers) to compliment the aerial survey data by assessing the seasonality and occurrence of echolocating cetaceans in the study area. Additionally, HDR will conduct photographic identification efforts opportunistically during C-POD deployments/refurbishments. The Centre for Research into Ecological and Environmental Modeling (CREEM) at the University of St. Andrews will advise on survey design for both the visual data and the passive acoustic data as well as analyze data from the line transect surveys using standard design-based analysis methods. Aerial surveys are expected to begin in March 2015 and C-PODs will be deployed once permits are processed (anticipated June 2015).

## 2. Methods

### 2.1 Passive Acoustic Methods

HDR will deploy five underwater acoustic monitoring devices to monitor for the presence of bottlenose dolphins that may be occurring in the study area. Although only five devices will be used at any one point, eight proposed locations were submitted for the permit application in order to allow for the adjustment of survey locations as the study progresses (**Figure 1**). The acoustic devices (C-PODs, chelonia.co.uk) can detect the presence of echolocating bottlenose dolphins (*Tursiops truncatus*) within approximately a 1-kilometer radius and will be dispersed in areas of interest that complement the aerial surveys. The C-POD devices will be bottom-mounted, and an acoustic release (Edgetech Sport MFE) will be used for retrieval. To be sure the device will float to the surface upon release, a float will be attached to the unit but will remain submerged during deployment, only rising to the surface upon release. The devices will be recovered and re-deployed every 4 months from a vessel for the duration of the 2-year project. The mooring system will consist of one small concrete block and three sandbags (footprint of approximately 0.8 meters (m) x 0.8 m) that will sit on the bottom. These moorings are considered sacrificial and will not be retrieved when the C-PODs are refurbished. Once deployed, the entire unit stretches less than 9 feet from the sea floor and deployment locations have been chosen based on depth and substrate. None of the proposed areas are vegetated so no damage to oyster beds or vegetation is expected. HDR has been deploying these units for more than 2 years in the Virginia Beach and Norfolk area with great success ([Engelhaupt et al. 2014](#)).



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2 Figure 1. Proposed locations of C-POD deployments around Naval Air Station PAX.

## 1 2.2 Aerial Survey Methods

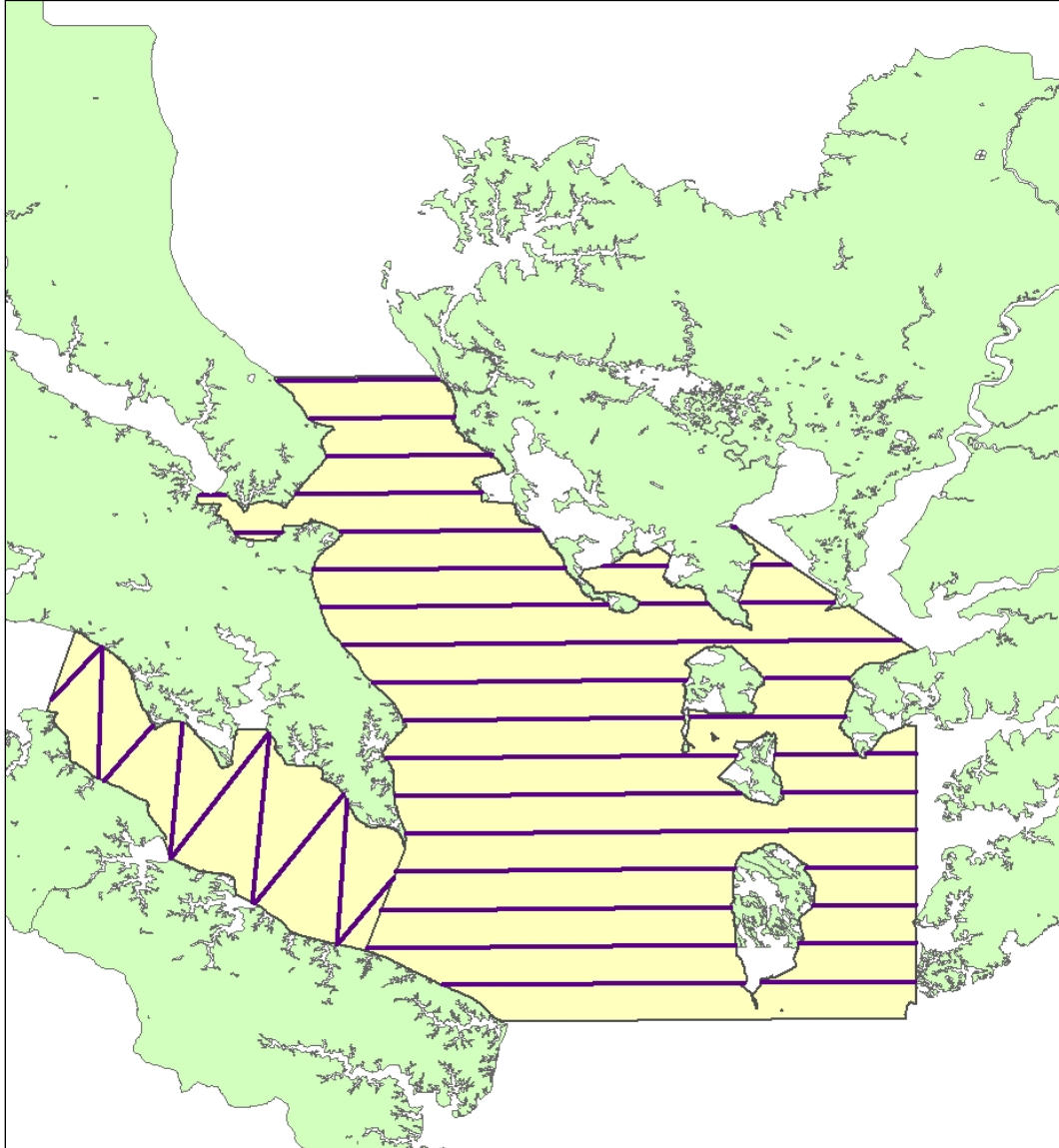
2 Monthly surveys will be conducted by UNCW for the 2-year duration of the project in the area of  
3 interest in order to document the occurrence and distribution of protected marine species.  
4 Surveys will generally be completed within one day for each month's coverage. Survey  
5 tracklines are shown in **Figure 2**. UNCW will work with Orion Aviation, as has been done on  
6 previous U.S Navy task orders, and will follow the same safety and general flight guidelines,  
7 using a fixed-wing aircraft flying at approximately 1,000 feet (305 m). Up to 350 nautical miles  
8 (648 kilometers) of trackline will be flown on each survey day.

## 9 3. Progress to Date

10 CREEM has finalized, aerial survey tracklines in collaboration with UNCW and aerial survey are  
11 expected to begin as weather allows in March 2015. Surveys will then be completed each  
12 month for a duration of 1 year, as weather allows. Review of results will take place following the  
13 1-year period to determine if adjustments to timing or coverage area are needed for the second  
14 year of data collection. The State of Maryland is processing the permit application to allow HDR  
15 to deploy the C-PODs in proposed locations. HDR will deploy the C-PODs at the first available  
16 weather and clearance window following the award of permit.

## 17 4. Literature Cited

18 Engelhaupt, A., M. Richlen, T.A. Jefferson, and D. Engelhaupt. 2014. Occurrence, Distribution,  
19 and Density of Marine Mammals Near Naval Station Norfolk & Virginia Beach, VA:  
20 Annual Progress Report. Prepared for U.S. Fleet Forces Command. Submitted to Naval  
21 Facilities Engineering Command (NAVFAC) Atlantic, Norfolk, Virginia, under Contract  
22 No. N62470-10-3011, Task Orders 031 and 043, issued to HDR Inc., Norfolk, Virginia.  
23 22 July 2014.



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2 Figure 2. Aerial survey tracklines to be flown over the PAX study area.