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Ms. Donna S. Wieting, Director
Office of Protected Resources
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
SSMC3, Room 13821
1315 East-West Highway
Silver Spring, MD 20910-3282

SUBJECT: EXERCISE AND MARINE MAMMAL MONITORING REPORT

The Navy is formally submitting to National Marine Fisheries Service (NMFS) the 2014 Exercise and Monitoring Reports for the Naval Sea Systems Command, Naval Undersea Warfare Center Division, Keyport Range Complex. This report satisfies reporting requirements specified in the NMFS Final Rule of 12 April 2011.

If you have any questions regarding this report, the points of contact are Ms. Shaari Unger at (360) 315-2258 and Mr. William Carlson at (360)315-3515.

Sincerely,

D. K. KOHNKE
Captain, U.S. Navy
Commander

Enclosure(s): 1. Annual Range Complex Exercise Report of September 2014
2. Annual Range Complex Exercise Report of October 2014

Prepared for and submitted to:
National Marine Fisheries Service
Office of Protected Resources
Prepared by:
Department of the Navy
In accordance with the Final Rule and Letter of Authorization
Under the MMPA .

# Annual Range Complex Exercise Report

## YEAR 4

**01 September 2013 to 31 August 2014**

**For The U.S. Navy's**

## Naval Sea Systems Command
## Naval Undersea Warfare Center
## Keyport Range Complex

**1 September 2014**

UNCLASSIFIED

ENCL.(1)

# YEAR 4 ANNUAL EXERCISE REPORT

## INTRODUCTION

The U.S. Navy prepared this Year 4 Annual Range Complex Exercise Report covering the period from 01 September 2013 to 31 August 2014 in compliance with the National Marine Fisheries Service (NMFS) Final Rule (dated: 12 April 2011) and Letter of Authorization (dated: 17 May 2011) under the Marine Mammal Protection Act for the Naval Sea Systems Command Naval Undersea Warfare Center Keyport Range Complex (NUWC KRC).

## SUMMARY

(1) The following contains the total annual hours of each type of sonar source and number of activities conducted at the three specific NUWC KRC sites within the dates listed above:

(a) Keyport Range

(b) Dabob Bay Range Complex (DBRC)

(c) Quinault Underwater Tracking Range (QUTR)

(2) Total annual hours of each type of sonar source:

**Table 1. Keyport Range Site**

| Acoustic Sources | Keyport Range | Total Hours Allotted | % Hours Used | Description of LOA Active Sources |
|---|---|---|---|---|
| S1 | 2.9 | 80 | 3.6% | Sub-Bottom Profiler |
| S2 | 2.9 | 42 | 6.9% | UUV Payloads (Special Sonars) |
| S3 | 0 | 42 | 0.0% | Acoustic Modem |
| S4 | 0.226 | 42 | 0.5% | Side-Scan Sonar and UUV Payloads |
| S5 | 0 | 1.33 | 0.0% | Range Targets |
| S6 | 0.167 | 0.33 | 50.6% | Torpedoes (both Electric and Thermal Propulsion) |
| S7 | 0 | 0.33 | 0.0% | Torpedoes (both Electric and Thermal Propulsion) |
| S8 | 0.019 | 0.33 | 5.8% | Torpedoes (both Electric and Thermal Propulsion) |

**Table 2. DBRC**

| Acoustic Sources | Dabob Bay Hours | Total Hours Allotted | % Hours Used | Description of LOA Active Sources |
|---|---|---|---|---|
| S1 | 0 | 80 | 0.0% | Sub-Bottom Profiler |
| S2 | 0 | 100 | 0.0% | UUV Payloads (Special Sonars) |
| S3 | 2.892 | 100 | 2.9% | Acoustic Modem |
| S4 | 1.823 | 100 | 1.8% | Side-Scan Sonar and UUV Payloads |
| S5 | 0 | 6.67 | 0.0% | Range Targets |
| S6 | 0.919 | 5.83 | 15.8% | Torpedoes (both Electric and Thermal Propulsion) |
| S7 | 0.332 | 5.83 | 5.7% | Torpedoes (both Electric and Thermal Propulsion) |
| S8 | 0.42 | 5.83 | 7.2% | Torpedoes (both Electric and Thermal Propulsion) |

**Table 3. QUTR**

| Acoustic Sources | QUTR Hours | Total Hours Allotted | % Hours Used | Description of LOA Active Sources |
|---|---|---|---|---|
| **S1** | 0 | **32** | 0.0% | Sub-Bottom Profiler |
| **S2** | 0 | **24** | 0.0% | UUV Payloads (Special Sonars) |
| **S3** | 0 | **24** | 0.0% | Acoustic Modem |
| **S4** | 0 | **24** | 0.0% | Side-Scan Sonar and UUV Payloads |
| **S5** | 0 | **1** | 0.0% | Range Targets |
| **S6** | 0 | **0.83** | 0.0% | Torpedoes (both Electric and Thermal Propulsion) |
| **S7** | 0 | **0.83** | 0.0% | Torpedoes (both Electric and Thermal Propulsion) |
| **S8** | 0 | **0.83** | 0.0% | Torpedoes (both Electric and Thermal Propulsion) |

(3) Total annual activities that occurred at each range site:

**Table 4. Keyport Range Site**

| | Type of Activity | Keyport Activity | Total Activities Allowed | % Activities Used |
|---|---|---|---|---|
| **Test Vehicle Propulsion** | Test Vehicle (thermal) | 0 | **5** | 0% |
| | Test Vehicle (electric / chemical) | 5 | **55** | 9% |
| **Other Testing Systems and Activities** | Submarine Testing | 0 | **0** | na |
| | Inert mine detection, classification and localization | 0 | **5** | 0% |
| | Non-Navy Testing | 0 | **5** | 0% |
| | Acoustic & Non-acoustic (magnetic array, oxygen) | 4 | **20** | 20% |
| | Countermeasure test | 2 | **5** | 40% |
| | Impact Testing | 0 | **0** | na |
| | Static in-water test | 0 | **10** | 0% |
| | UUV | 6 | **45** | 13% |
| | UAS | 0 | **0** | na |
| **Fleet Activities (excluding RDT&E)** | Fleet surface ship | 0 | **1** | 0% |
| | Fleet aircraft | 0 | **0** | na |
| | Fleet submarine | 0 | **0** | na |
| | Fleet diver | 0 | **45** | 2% |
| **Deployment Systems (RDT&E)** | Surface launch craft | 3 | **35** | 9% |
| | Special purpose barge | 2 | **25** | 8% |
| | Fleet RDT&E vessel | 0 | **15** | 0% |
| | RDT&E aircraft | 0 | **0** | na |
| | Shore and Pier | 0 | **45** | 0% |

**Table 5. DBRC**

| | Type of Activity | DBRC Activity | Total Activities Allowed | % Activities Used |
|---|---|---|---|---|
| **Test Vehicle Propulsion** | Test Vehicle (thermal) | 10 | **130** | 8% |
| | Test Vehicle (electric / chemical) | 20 | **140** | 14% |
| **Other Testing Systems and Activities** | Submarine Testing | 0 | **45** | 0% |
| | Inert mine detection, classification and localization | 0 | **20** | 0% |
| | Non-Navy Testing | 0 | **5** | 0% |
| | Acoustic & Non-acoustic (magnetic array, oxygen) | 9 | **10** | 90% |
| | Countermeasure test | 0 | **50** | 0% |
| | Impact Testing | 0 | **10** | 0% |
| | Static in-water test | 2 | **10** | 20% |
| | UUV | 2 | **120** | 2% |
| | UAS | 0 | **2** | 0% |
| **Fleet Activities (excluding RDT&E)** | Fleet surface ship | 0 | **10** | 0% |
| | Fleet aircraft | 0 | **10** | 0% |
| | Fleet submarine | 4 | **30** | 13% |
| | Fleet diver | 4 | **5** | 80% |
| **Deployment Systems (RDT&E)** | Surface launch craft | 9 | **180** | 5% |
| | Special purpose barge | 0 | **75** | 0% |
| | Fleet RDT&E vessel | 0 | **20** | 0% |
| | RDT&E aircraft | 0 | **10** | 0% |
| | Shore and Pier | 0 | **30** | 0% |

**Table 6. QUTR**

| | Type of Activity | QUTR Activity | Total Activities Allowed | % Activities Used |
|---|---|---|---|---|
| **Test Vehicle Propulsion** | Test Vehicle (thermal) | 0 | **30** | 0% |
| | Test Vehicle (electric / chemical) | 0 | **30** | 0% |
| **Other Testing Systems and Activities** | Submarine Testing | 0 | **15** | 0% |
| | Inert mine detection, classification and localization | 0 | **10** | 0% |
| | Non-Navy Testing | 0 | **5** | 0% |
| | Acoustic & Non-acoustic (magnetic array, oxygen) | 0 | **5** | 0% |
| | Countermeasure test | 0 | **5** | 0% |
| | Impact Testing | 0 | **5** | 0% |
| | Static in-water test | 0 | **6** | 0% |
| | UUV | 0 | **40** | 0% |
| | UAS | 0 | **2** | 0% |
| **Fleet Activities (excluding RDT&E)** | Fleet surface ship | 0 | **10** | 0% |
| | Fleet aircraft | 0 | **10** | 0% |
| | Fleet submarine | 0 | **30** | 0% |
| | Fleet diver | 0 | **15** | 0% |
| **Deployment Systems (RDT&E)** | Surface launch craft | 0 | **20** | 0% |
| | Special purpose barge | 0 | **20** | 0% |
| | Fleet RDT&E vessel | 0 | **20** | 0% |
| | RDT&E aircraft | 0 | **20** | 0% |
| | Shore and Pier | 0 | **30** | 0% |

Prepared for and submitted to:
National Marine Fisheries Service
Office of Protected Resources

Prepared by:
Department of the Navy
In accordance with the Letter of Authorization
Under the MMPA and ITS authorization under the ESA

# Annual Range Complex Monitoring Report

YEAR 4

1 September 2013 to 31 August 2014

For The U.S. Navy's
NAVSEA NUWC Keyport Range Complex

October 2014



ENCL (2)

THE U.S. NAVY'S

NAVSEA NUWC KEYPORT RANGE COMPLEX
YEAR 4 ANNUAL MONITORING REPORT

## Introduction

The U.S. Navy (Navy) prepared this Year 4 Annual Range Complex Monitoring Report in compliance with the National Marine Fisheries Service (NMFS) Final Rule under the Marine Mammal Protection Act for the Naval Undersea Warfare Center (NUWC) Keyport Range Complex, reference (a), and the Letter of Authorization (LOA)/ Biological Opinion, reference (b). This report describes the marine mammal monitoring efforts during High Frequency Active Source (HFAS) and Mid-Frequency Active Source (MFAS) events, as well as recommendations for improving future survey design and data collection.

The methodology and results of the marine mammal monitoring efforts, as well as results from the pre and post-event marine mammal surveys are described in Appendix A. Navy Marine Mammal Observers (NMMOs) were attached to the Public Works Department Environmental Division of Naval Facilities Engineering Command (NAVFAC) Northwest (NW) at Everett, Washington.

## Year Four Summary

The Navy met its fourth year NUWC Keyport Range Complex monitoring obligations as specified in the NMFS Final Rule, reference (a), and subsequent LOA and Biological Opinion, reference (b). This report documents the results of the required HFAS and MFAS events in the Dabob Bay Range Complex (DBRC) Site, which included NMMOs for the two required specified events. Because the opportunity presented itself, there were two additional events also reviewed and therefore added to the information available regarding marine mammal observation.

Recommendations:

The monitoring effort met the intent of watching for marine mammals and following established procedures in order to avoid effects from Navy testing activities. Weather conditions that caused choppy water may have impaired the ability of observers to see marine mammals; however, there was redundancy in the observations with NMMO, NAVSEA escorts and range personnel positioned both on the water and along the shoreline. Because Dabob Bay within the survey area is fairly narrow (1.8 to 3.4 miles across) the entire expanse of water between the shorelines can be seen can be seen from the water and from the shoreline.

Harbor seals are naturally present and ubiquitous in Dabob Bay year-round. According to conditions of the LOA and monitoring requirements, certain data must be collected during the

monitoring effort; however, it's unlikely conclusions can be drawn regarding direct effects from Navy testing activities. Variation in the number of seals observed year-to-year or even day-to-day likely reflects the natural seasonal variation and daily movements of the animals and cannot be directly correlated with effects of Navy testing activities. Year-to-year comparisons are not appropriate for the pre- and post-test presence/absence study design as there are multiple variables influencing the results (e.g., time of year of the surveys, weather conditions affecting visibility, etc.).

The main utility of the surveys is to document the presence of marine mammals, augment the monitoring performed by lookouts and shipboard crew to avoid and/or delay active acoustic tests when marine mammals are spotted within the exclusion zones, and record responses or behavioral changes of the marine mammals. The compilation of the monitoring data over the 5 year timeframe of the LOA can support future characterizations of potential effects to marine mammals from testing activities at the DBRC. For this year's monitoring effort, no noticeable behavior was observed in harbor seals that would indicate impacts from the acoustic testing activities.

Appendix A
Annual DBRC Monitoring Activities in Support of NAVSEA NUWC Keyport Range Complex
Developed by
Public Works Department Environmental Division of Naval Facilities Engineering Command (NAVFAC) Northwest (NW) at Everett, Washington.

## Introduction

Under the Marine Mammal Protection Act (MMPA), the Navy was issued a Letter of Authorization (LOA) governing the unintentional taking of marine mammals incidental to activities conducted at the NAVSEA NUWC Keyport Range Complex for the period of May 2012 through April 2016. Specific monitoring requirements for these activities are included in the Biological Opinion that was issued on the LOA, and in 50 CFR Part 218 Subpart R which pertains to taking of marine mammals incidental to Navy testing activities at the NAVSEA NUWC Keyport Range Complex, which includes the NUWC Keyport Range Site, the Dabob Bay Range Complex (DBRC) Site (Figure 1) and the Quinault Range Site previously referred to as the Quinault Underwater Tracking Range.

Visual surveys and monitoring activities were conducted by Navy Marine Mammal Observers (NMMOs) during 03 and 04 June 2014 at the DBRC Site as part of the monitoring requirements. The effort encompassed vessel-based marine mammal surveys before and after High Frequency Active Source (HFAS) and Mid-Frequency Active Source (MFAS) events, and monitoring for the presence of marine mammals during the test events from the water and from the shore.

Our intent was to document the presence of marine mammals and record observations about their behavior during the activities in the range. This was the fourth consecutive year of this monitoring effort. This year's effort contributes to characterizing marine mammal presence and behavior in Dabob Bay before, during, and after test activities.

Appendix A
Annual DBRC Monitoring Activities in Support of NAVSEA NUWC Keyport Range Complex
Developed by
Public Works Department Environmental Division of Naval Facilities Engineering Command (NAVFAC) Northwest (NW) at Everett, Washington.

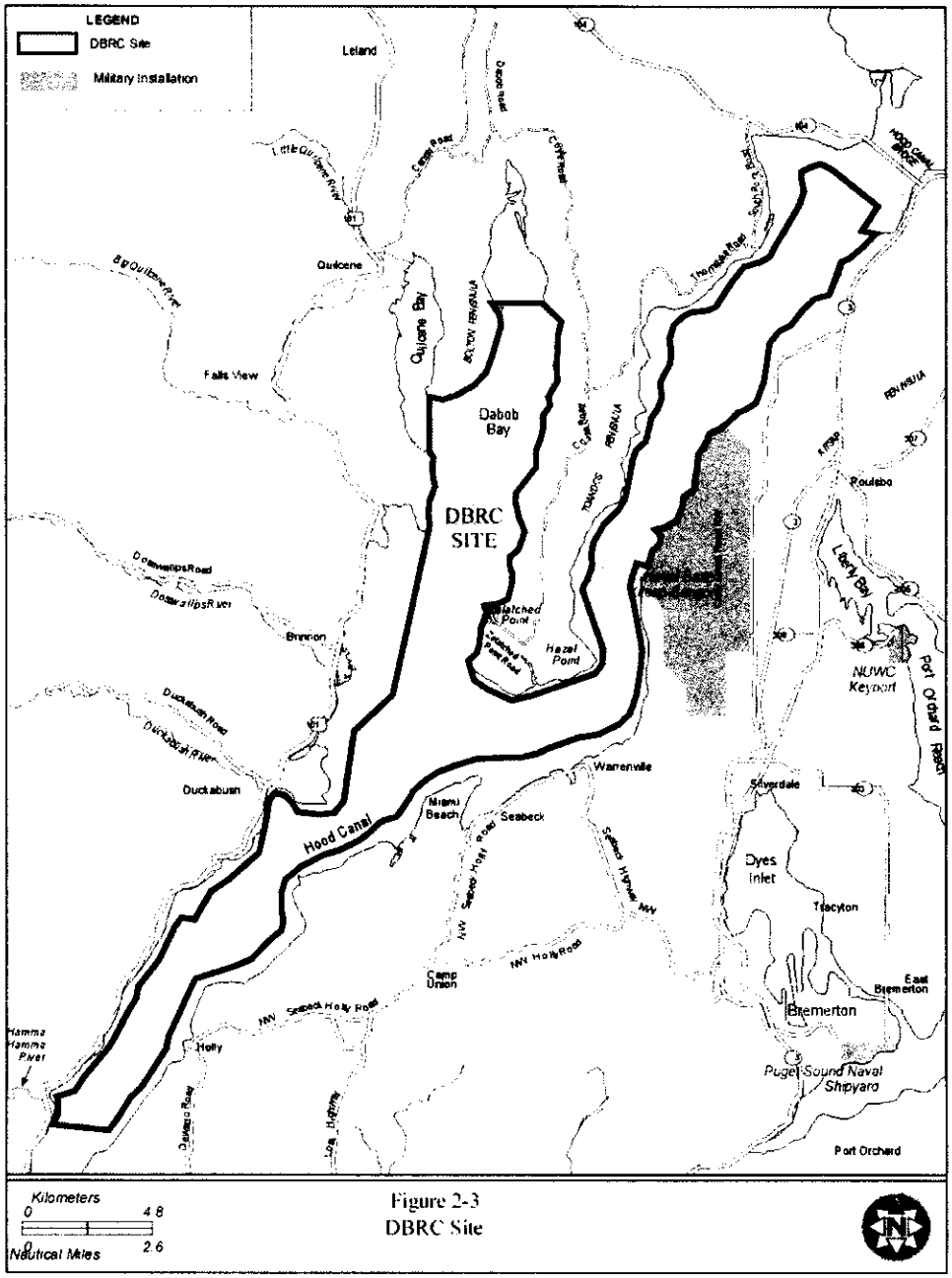


**Figure 1: Dabob Bay Range Complex Site**

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Annual DBRC Monitoring Activities in Support of NAVSEA NUWC Keyport Range Complex
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## Materials and Methods

The survey effort focused on marine mammals that could potentially occur in the DBRC. The DBRC is located in Dabob Bay, within Hood Canal in Jefferson and Kitsap Counties (Figure 1). Surveys and monitoring took place in the northern part of the DBRC, from the southern end of Zelatched Point to the southern end of Bolton Peninsula to the north.

Dabob Bay is a long, narrow, deep channel approximately $25mi^2$ in size. Within the surveyed area, the channel width ranges from 1.8 to 3.4 miles and the shore can be seen from all locations on the water, and from the opposite shoreline. Details about Dabob Bay and Navy testing activities can be found in the 14 May 2012 National Marine Fisheries Service Endangered Species Act Section 7 Consultation Biological Opinion and MMPA authorization documents.

Three individuals from the Public Works Department Environmental Division of Naval Facilities Engineering Command (NAVFAC) Northwest (NW) at Everett, Washington performed pre- and post-test shoreline surveys and monitored during test events. Two people operated from the water in a small vessel within the DBRC. One person operated from the shore and from the upland computer building at the Zelatched Point Computer Site (Figure 1).

On-water surveys of the shoreline were conducted from a 25' NS-50 vessel. The NMMOs on the water were paired with a Navy escort who also functioned as an additional lookout, along with the standard crew. The NMMO stationed on the shoreline at the Computer Site was also paired with a Navy escort/lookout and monitored from the shore and from the computer building. The Ranger Officer, Test Director, Tracking Technicians and other staff at the computer building also watched for marine mammals. The Computer Site houses the monitoring system for the passive acoustic monitoring array (PAM), which was utilized to detect acoustically active marine mammals.

Survey and monitoring activities consisted of visual observations by the naked-eye augmented by the use of 8X42 magnification binoculars. Additionally, 10X32 magnification laser "Rangefinder" binoculars were used but were of limited utility for determining the distance to animals in the water because of choppy water conditions. The wave action impaired the ability of the binocular's laser to remain fixed on the animal long enough to determine the distance.

Handheld Garmin Global Positioning System (GPS) units were used to record the NMMO's position when an animal was seen. The animal's distance from the observer was measured using the "Rangefinder" binoculars when possible, within the constraints created by sea conditions. Otherwise the distance from the observer to the animal was estimated.

Information about marine mammal sightings and additional pertinent data (weather, time, visibility, etc.) were recorded on data sheets. For data collected from the NS-50 vessel, the column labeled "Animal's direction of travel" was renamed: "Animal's location relative to boat position" because only harbor seals were seen and they surfaced for a few seconds then dove underwater; therefore, a specific direction of travel could not be determined.

Onboard the NS-50, the GPS unit was also used to record the track of the vessel movements while conducting the shoreline surveys. On the NS-50, one person maintained the data sheets and recorded information about sightings. Both NMMOs watched for marine mammals as did the escort and crew. All sightings were recorded on the same data sheet.

The NMMO conducting surveys from the shore also recorded sightings on data sheets. The shore-based observers surveyed the entire site from windows at the Zelatched Point Computer Site using both naked-eye observations, binoculars, and floor-mounted Navy ship binoculars (otherwise known as "big-eyes"). From the beach below the Zelatched Point bluff, the DBRC was surveyed using the naked eye and 10X32 magnification laser "Rangefinder" binoculars. However, the capability to determine range was hindered due to choppy water conditions.

Essentially four separate activities occurred for this effort on two consecutive days (03 and 04 June 2014):

**1) Pre-Test Shoreline Survey** - Conducted from the water, and from the Zelatched Point Computer Site.

**2) Monitoring During Test Events** - Conducted from the water, and from the shoreline in front of the Computer Site (combination of Zelatched Point Computer Site observation deck and beach).

**3) Same-Day Post-Test Shoreline Survey** - Conducted from the water, and from the shoreline along the beach at the Zelatched Point Computer Site.

**4) Next-Day Post-Test Shoreline Survey** - Conducted from the water, and from the shoreline beach in front of the Zelatched Point Computer Site.

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**1) Pre-Test Shoreline Survey** (Tuesday, 03 June 2014)

A 25' NS-50 vessel was used to transit to the DBRC. The NS-50 left Naval Base Kitsap (NBK) Bangor in Hood Canal at approximately 07:30. At this time, there was an incoming tide. The NS-50 crew consisted of a Craft Master, deckhand, one NAVSEA escort/marine mammal lookout, and two NMMOs. All personnel watched for marine mammals. One NMMO was also responsible for maintaining the data sheets and recording the coordinates of sightings made by anyone onboard. The vessel travelled at 10-12 knots during the shoreline survey.

Marine mammal monitoring began immediately after departing NBK Bangor and continued throughout the transit to and from the DBRC. Observers scanned the water in all directions.

Test activities and surveying took place in the northern part of the DBRC, within Dabob Bay. To conduct the pre-test shoreline survey, the vessel travelled clockwise from south to north along the western side of Dabob Bay for about 6 miles, turned east and crossed the bay, then travelled south along the eastern side of Dabob Bay. This pattern covered the perimeter of the bay. It was possible to see from shore to shore using this transect path.

The NMMO and NAVSEA escort at the Zelatched Point Computer Site began monitoring from the bluff once the NS-50 vessel entered the range. Surveys included visual observations by the naked eye, binoculars, and big-eyes. Surveying was conducted by both the NMMO and NAVSEA escort throughout the entire time the vessel was covering the perimeter of the bay.

**2) Monitoring During Test Events** (Tuesday, 03 June 2014)

Because there were multiple tests that occurred during the test day, monitoring was conducted while moving to the appropriate monitoring position, during test equipment mobilization, and throughout the waiting time between actual test events. Monitoring occurred during MFAS and HFAS test events.

*On-water* - Upon completion of the pre-test shoreline survey, the NS-50 was positioned near an MFAS source to observe the MFAS-1 test. The MFAS originated from an underwater stationary source. This source is characterized in the LOA and Environmental Impact Statement (EIS). The NS-50 was initially positioned above the source but was allowed to drift during the test. Sightings were reported to the Range Officer prior to turning on the MFAS per range operation procedures. The start and stop time of the MFAS source was within a 20-minute period with four sets of active pulses within the 20-minute period.

After the MFAS-1 test was complete, the NMMOs and Navy escort transferred to the YTT-10 ship for HFAS test events. The YTT-10 is a much larger vessel and has a higher vantage point for viewing. The Navy escort and NMMOs monitored the area within and beyond the track of the HFAS source in all directions from the bridge wings.

After the HFAS tests, the NMMOs and escort transferred back onto the NS-50 and travelled to a position over the MFAS test area where a repeat of the MFAS test consisting of four sets of active pulses within a 20-minute period was conducted.

When a marine mammal was sighted during either the MFAS or HFAS events, the vessel Craft Master was informed and immediately relayed the information to the DBRC Range Officer.

*Shoreline* - One NMMO surveyed from the shoreline and was paired with a NAVSEA Navy escort. This shore-based survey was conducted at Zelatched Point from the DBRC Computer Site on the bluff and by walking along the beach looking for hauled-out or near shore marine mammals. The bottom-moored passive acoustic array was also turned on so the range Operators and Biologists could listen and watch the waterfall display from the PAM array. The Computer Site provided a location for a high bluff overall look at the DBRC Site. The pre-test shore survey covered approximately 500 meters of shoreline along the eastern shore of Dabob Bay.

During the MFAS test, the NMMO and NAVSEA Navy escort remained at the Zelatched Point Computer Site and monitored for marine mammals from the high vantage point overlooking the DBRC. Distance from the water and geology of the bluff prevented the observers from seeing the beach shoreline from this location; therefore, the NMMO and NAVSEA escort also watched the waterfall display from the PAM array for indications of biological noise activity. The NMMO and NAVSEA escort were within direct communication with the Range Officer regarding start and stop times for the 20-minute interval of MFAS testing.

The NMMO and NAVSEA Navy escort walked down to the beach to conduct observations during the HFAS testing. The NAVSEA escort facilitated effective communications between the Range Officer utilizing handheld radios. Both the NMMO and NAVSEA Navy escort surveyed the DBRC using the naked eye, 8X42 magnification binoculars, and 10X32 magnification laser "Rangefinder" binoculars. The observers walked from the Zelatched Point pier at the north end of the beach property to the southern edge of the Navy property boundary during the surveying.

**3) Same-Day Post-Test Shoreline Survey** (Tuesday, 03 June 2014)

After completing the test monitoring, another shoreline survey was conducted. This survey was carried out similar to the pre-test shoreline survey, described above. The NS-50 travelled in the opposite direction however, going north along the eastern shoreline of Dabob Bay, turning west and crossing the bay, then travelling south along the western shoreline to complete the survey. At this time, there was an incoming tide. After conducting this survey, the vessel returned to the NBK Bangor dock.

Shore-based surveys from the Zelatched Point beach were conducted by the NMMO and NAVSEA Navy escort during the same time as the vessel-based shoreline survey. The beach survey monitored for any change in location or behavior of marine mammals.

**4) Next-Day Post-Test Shoreline Survey** (Wednesday, 04 June 2014)

*On-water* - Another shoreline survey was conducted in order to match the time and tide of the previous day's survey. This survey was carried out similar to the pre-test shoreline survey, described above. The NS-50 left the NBK Bangor dock at about 07:30 on an incoming tide and travelled north along the western shoreline of Dabob Bay, turned east and crossed the bay, then travelled south along the eastern shoreline to complete the survey. After conducting this survey, the vessel returned to the NBK Bangor dock.

*Shoreline* - The Zelatched Point Computer Site shore facility was staffed by one NMMO and the NAVSEA Navy escort who observed from both the Computer Site on the bluff and from the beach. The NMMO was positioned on the beach and the NAVSEA Navy escort remained at the Computer Site during the post-test survey. The NMMO was notified via handheld radio about the position of the NS-50 travelling around the perimeter of the site. The PAM array monitoring system in the computer building was also operating, in order to detect marine mammals.

Appendix A
Annual DBRC Monitoring Activities in Support of NAVSEA NUWC Keyport Range Complex
Developed by
Public Works Department Environmental Division of Naval Facilities Engineering Command (NAVFAC) Northwest (NW) at Everett, Washington.

## Results - Summary

Harbor seals were observed in the DBRC during the two consecutive days of monitoring. Animals were seen from the shoreline location and from the NS-50 and YTT-10 vessels before, during, and after range tests.

On three occasions, seals were spotted within the 100-yard exclusion zone prior to the commencement of tests. In these cases, the Range Officer was notified and test events were delayed until the animal could no longer be seen. No other marine mammals were seen during the monitoring effort.

Fourteen individual sightings of seals were recorded over the two days (Tables 1 and 2). The sightings included 12 individual adult harbor seals, one occurrence of 2 seals together, and 1 group of 15 seals seen from the NS-50 at a known haulout site during the pre-test shoreline survey. Twenty-nine animals were tallied in total but an unknown number of these animals could have been multiple sightings of the same seal. Nine sightings were from the water and five were from the shore location.

**Table 1. Sightings of harbor seals, 03 June 2014.**

| | On water | From shore/ computer site | Total Seals Counted |
|---|---|---|---|
| Pre-test shoreline survey | 2[1] (16 seals) | 0 | 16 |
| Test Events | 4[2] (5 seals) | 3 | 8 |
| Post-test shoreline survey | 0 | 0 | 0 |
| Total | | | 24 |

[1] Includes one sighting of 15 animals hauled out north of Pulali Point.
[2] Includes one sighting of 2 animals.

**Table 2. Sightings of harbor seals, 04 June 2014.**

| | On water | From shore/ computer site | Total Seals Counted |
|---|---|---|---|
| Second day shoreline survey | 3 | 2 | 5 |

The NMMOs spent approximately 24.5 total hours of effort on 03 June and 6.5 total hours on 04 June conducting surveys and monitoring during tests (Table 2). This total number of hours encompasses daily start-to-finish work times.

**Table 2. NMMO survey and monitoring effort.**

| Date | On-water | | On shore | Total |
|---|---|---|---|---|
| | NMMO 1 | NMMO 2 | NMMO 3 | |
| 03 June 2014 | 9.5 | 9.5 | 10 | 29 |
| 04 June 2014 | 2.5 | 2.5 | 1.5 | 6. 5 |

Beaufort Sea States ranged from 1-4 over the two days and were mostly in the 3-4 range with breezy to windy conditions. Waters were choppy with some waves breaking over for the majority of the two days. Waves were 1-4 feet high. There were rolling swells near shorelines.

Although the sky was mostly overcast with a 1,000-foot ceiling and a marine haze persisted during most of the surveying effort, visibility was good and sunbreaks occurred in the afternoon. Weather conditions from this perspective did not impair visibility conditions. However, the rough water may have prevented the sighting of marine mammals that were in the water.

## Time requirement:

The shoreline surveys met the requirement to occur within 36 hours prior to, and 36 hours after active test activities. For the pre-test shoreline survey, observations were recorded from the vessel and from shore between 07:30 and 08:55. The MFAS and HFAS testing events then occurred between 09:01 and 16:17. Post- test surveys began immediately after the testing on the same day. The following day post-test shoreline surveys began at approximately 07:26.

Tide correlations:

The timing and tidal cycle of the post-test survey conducted on Wednesday, 04 June corresponded to that of the pre-test survey the previous day (Tables 3, 4). On both days the surveys started after the morning low tide and continued through the tide cycle, ending after the morning high tide.

**Table 3: Pre-test shoreline survey and tides for 03 June 2014[1]**

| Time | Height (ft) | Tide | Comment |
|---|---|---|---|
| 03:52 am | 5.94 | Low Tide | Incoming Tide |
| 05:15 | | | Sunrise |
| 07:30 | | | Pre-test Survey starts |
| 08:10 | | | 15 HS at known haulout |
| 08:18 | | | 1 HS seen |
| 08:27 | 8.15 | High Tide | |
| 08:55 | | | Survey ends |
| 15:15 pm | .88 | Low Tide | |

[1] **Tide Reference: http://tides.mobilegeographics.com/locations/7160.html?y=2014&m=6&d=3**

**Table 4: Post-test shoreline survey and tides for 04 June 2014**

| Time | Height (ft) | Tide | Comment |
|---|---|---|---|
| 04:51 am | 5.43 | Low Tide | Incoming Tide |
| 05:15 | | | Sunrise |
| 07:26 | | | Post-test Survey starts |
| 08:44 | | | 1 HS seen |
| 08:48 | | | 1 HS seen |
| 09:32 | 7.61 | High Tide | |
| 09: 42 | | | 1 HS seen |
| 10:00 | | | Survey ends |
| 16: 01 pm | 1.88 | | Low Tide |

[1] **Tide Reference:**
**http://tides.mobilegeographics.com/locations/7160.html?y=2014&m=6&d=4**

## Results – Details

### 1) Pre-Test Shoreline Survey

On 03 June 2014, 16 harbor seals were seen during the pre-test shoreline survey. Fifteen animals were spotted on the shore at a known haulout on the west side of Dabob Bay just north of Pulali Point. This location had been previously identified by Jeffries et al. (2000) as location ID 256 and consists of intertidal rocks. According to Jeffries et al. this site has less than 100 individuals at any given time, but it is classified as a high use haulout. One harbor seal was seen in the water during the pre-test shoreline survey.

The survey craft left the NBK Bangor dock at 07:30. Animals were seen between 08:00 and 08:20 and the pre-test survey ended at 08:55 after traveling the perimeter of the DBRC. No marine mammals were spotted from the shore or via the PAM array at the Zelatched Point Computer Site during this pre-test survey.

### 2) Monitoring During Test Events

*On-water* - One harbor seal was seen about 75 yards from the NS-50 between the third and fourth active MFAS pulse of MFAS-1 test. After several seconds, the animal dove underwater. The Range Operator was notified and testing suspended for several minutes. The seal was not seen again during the MFAS-1 test.

NMMOs and the Navy escort transferred to the YTT-10 ship at approximately 10:00 to monitor during the HFAS tests. No marine mammals were seen during the HFAS-1 and HFAS-2 tests. One harbor seal was seen about 75 yards from the YTT-10 after these acoustic tests had ended. After conclusion of the HFAS tests, the NMMOs and Navy escort transferred back to the NS-50 for the second MFAS test (MFAS-2). Two harbor seals were seen about 75-100 yards from the NS-50, and then one additional sighting occurred shortly thereafter. After several seconds, the animals dove underwater. The Range Operator was notified and testing suspended for several minutes. The seals were not seen again during the MFAS-2 test.

*Shoreline* – One harbor seal was seen at 13:45 after completion of the HFAS-1 test. Another sighting was recorded at 14:02 prior to the HFAS-2 test. The animal was estimated to be about 5 yards from shore. One additional sighting occurred at 14:22, after launch of the HFAS-2 test. The seal was estimated to be about 17 yards from shore. The Range Operator was notified for situational awareness.

No marine mammals were seen in the exclusion zones during the test events using the beach survey method. Sightings before a test event were well outside the exclusion zone.
The PAM device was monitored by the Range Officer and Computer Site crew. No marine mammals were detected using the PAM device, but it was monitored continuously in real time.

During the shore observation period, the Range Officer and Computer Site crew monitored the PAM array while the NMMO and escort were focused on surveying the shoreline and were not within audible range of the PAM speaker. No marine mammals were detected using the PAM system.

**3) Same-Day Post-Test Shoreline Survey**

*On-water* - Upon conclusion of testing, the NS-50 was used to conduct a post-test shoreline survey. This survey took about 1 hour; from 16:16 to 17:16. No marine mammals were seen in the Range Complex during this survey. One harbor seal with a pup was seen outside the Range Complex, near the NBK Bangor dock. The survey ended at about 17:16 after traveling the perimeter of the DBRC.

Shoreline – The NMMO and NAVSEA Navy escort remained on the beach during the post-test and surveyed the DBRC from the Zelatched Point pier at the north, to the southern extent of the Navy property boundary. No marine mammals were spotted during this time.

**4) Next-Day Post-Test Shoreline Survey** (Wednesday, 04 June)

*On-water* - The NS-50 vessel left the NBK Bangor dock at 07:26. Three sightings of harbor seals in the water occurred. None were seen at the haulout site north of Pulali Point on this day. A small motorized skiff carrying two individuals was operating near the haulout and its presence may have caused seals to move off the shoreline into the water. Animals were seen between 08:44 and 09:42 and the survey ended at 9:53 after traveling the perimeter of the DBRC.

*Shoreline* – Two sightings of harbor seals occurred. One seal was seen in the water about 330 yards from shore and one was seen about 660 yards south of the pier. The survey effort started at 08:21 and concluded at 09:54.

## Discussion and Recommendations

The monitoring effort met the intent of watching for marine mammals and following established procedures in order to avoid effects from Navy testing activities. Weather conditions that caused choppy water may have impaired the ability of observers to see marine mammals; however, there was redundancy in the observations with NMMO and NAVSEA escorts positioned both on the water and along the shoreline. Because Dabob Bay within the survey area is fairly narrow (1.8 to 3.4 miles across) the entire expanse of water between the shorelines can be seen can be seen from the water and from the shoreline.

Harbor seals are naturally present and ubiquitous in Dabob Bay year-round. According to conditions of the LOA and monitoring requirements, certain data must be collected during the monitoring effort; however, it's unlikely conclusions can be drawn regarding direct effects from Navy testing activities. Variation in the number of seals observed year-to-year or even day-to-day likely reflects the natural seasonal variation and daily movements of the animals and cannot be directly correlated with effects of Navy testing activities. Year-to-year comparisons are not appropriate for the pre- and post-test presence/absence study design as there are multiple variables influencing the results (e.g., time of year of the surveys, weather conditions affecting visibility, etc.).

The main utility of the surveys is to document the presence of marine mammals, augment the monitoring performed by lookouts and shipboard crew to avoid and/or delay active acoustic tests when marine mammals are spotted within the exclusion zones, and record responses or behavioral changes of the marine mammals. The compilation of the monitoring data over the 5 year timeframe of the LOA can support future characterizations of potential effects to marine mammals from testing activities at the DBRC. For this year's monitoring effort, no noticeable behavior was observed in harbor seals that would indicate impacts from the acoustic testing activities.

## Shore-Based Surveys

The shoreline-based walking survey conducted prior to and following the sonar events from the Zelatched Point facility beach was of value. The beach walk does provide a sub-sample of the shoreline. Monitoring from the Computer Site on the bluff provides an overall view of the range. The use of binoculars and big-eyes from this vantage point is required. Due to the lay of the land, the immediate shore is not visible from the Computer Site. Surveying along the shoreline provides the means to see the shore area directly below the Computer Site.

The Computer Site also affords the observer the opportunity to listen and watch the waterfall display from the Passive Acoustic Monitoring hydrophone array in real time which provides another indicator of the presence of marine mammals or other biological activity underwater. Interpreting the acoustic data from the PAM hydrophone array requires specialized skill and training. The value of assigning one person to monitor the PAM array and interpret the data should be evaluated for future monitoring efforts.

## Vessel-Based Surveys

The pre- and post-event vessel surveys from the N-50 provided an effective means to scan the entire shoreline adjacent to the range.

Previously the NMMOs recommended that pre- and post-test shoreline surveys occur at the same time of day and potentially the same tidal cycle during daylight hours to capture patterns in daily activity levels and haulout behavior potentially influenced by tidal state. This year we conducted pre- and post-test surveys as recommended on two consecutive days; however so few animals were seen that conclusions could not be made regarding patterns in daily activity level, haulout behavior, or effects from Navy activities. For consistency and comparisons over time, future surveys should continue the practice of conducting post-test surveys at the same time of day and tidal cycle as the pre-test surveys.

In addition, London et al. (2012) documented haul-out changes based on season of the year (summer and pre-Labor Day vs. winter and post-Labor Day). Therefore, it is not recommended to compare the number of marine mammal sightings across seasons as this may result in natural fluctuations of animal populations that would have no correlation with Navy activities.

The abundance of harbor seals in Hood Canal has stabilized in recent decades, and the population may have reached its carrying capacity in the mid-1990s at an approximate abundance of 1,000 harbor seals (Jeffries et al. 2003). They are routinely seen throughout the DBRC Site, regardless of the level of human activity. Although harbor seals were seen during the pre- and post-test surveys, based on their numbers and residence in the location of DBRC, they would likely be seen year-round. The pre- and post-test surveys did not seem to provide additional occurrence information that was useful for this species.

The NMMOs previously suggested the behavioral response of marine mammals to either HFAS or MFAS is more effectively determined using a Behavioral Response Study (BRS) versus a pre- and post-test presence/absence study design. The BRS research is being conducted at selected

Navy ranges (e.g. SOCAL) based on specific conditions that make those ranges more suitable for a BRS. The utility of this type of study should be evaluated for the NUWC Keyport Range Complex.

## MFAS and HFAS Event: Marine Mammal Monitoring

The NMMOs contributed to this monitoring effort and met the intent of the LOA on the one day they were surveying the DBRC. During the actual testing events using MFAS (and possibly HFAS) it was suggested in previous reports that observers provide continuous scanning capability and coverage of the survey area during 15 minutes prior to an event. This is the role of the RSO and Craft Masters and their designated Watch Standers, who are continually surveying for security and navigational hazards and are dedicated to identify anything whether mechanical or biological that would affect the security and or the safety of personnel, equipment, or delay an activity.

Situations could occur where an animal may be submerged when the range clearing procedure begins, and it may remain underwater during the range clearing procedure; In this circumstance, the observer would know to wait until the animal resurfaced (maximum of 15 minutes for harbor seals) to make sure it was sighted outside the range before the acoustic source goes active. The Watch Standers are well trained at marine mammal identification and followed the existing standard operating procedures. Communication and coordination between the Range Operator and the captains of each vessel on the range was precise and effective and test events were delayed when a notification was made of a harbor seal in the immediate area.

## Literature Cited

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