Whereas, notice inviting public comment was given in the **Federal Register** (80 FR 48806–48807, August 14, 2015) and the amended application has been processed pursuant to the FTZ Act and the Board's regulations; and,

Whereas, the Board adopts the findings and recommendation of the examiner's report, and finds that the requirements of the FTZ Act and the Board's regulations are satisfied;

Now, Therefore, the Board hereby orders:

The amended application to expand FTZ 225 under the ASF is approved, subject to the FTZ Act and the Board's regulations, including Section 400.13, to the Board's standard 2,000-acre activation limit for the zone, and to an ASF sunset provision for magnet sites that would terminate authority for Site 4 if not activated within five years from the month of approval.

Signed at Washington, DC, this 29th day of July, 2016.

Ronald K. Lorentzen,

Acting Assistant Secretary of Commerce for Enforcement and Compliance, Alternate Chairman, Foreign-Trade Zones Board.

[FR Doc. 2016–18791 Filed 8–8–16; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

Foreign-Trade Zones Board

[Order No. 2009]

Expansion of Foreign-Trade Zone 149 Under Alternative Site Framework Freeport, Texas

Pursuant to its authority under the Foreign-Trade Zones Act of June 18, 1934, as amended (19 U.S.C. 81a–81u), the Foreign-Trade Zones Board (the Board) adopts the following Order:

Whereas, the Board adopted the alternative site framework (ASF) (15 CFR Sec. 400.2(c)) as an option for the establishment or reorganization of zones;

Whereas, Port Freeport, grantee of Foreign-Trade Zone 149, submitted an application to the Board (FTZ Docket B–65–2015, docketed September 22, 2015) for authority to expand existing Site 1 of the zone under the ASF to include additional acreage in Freeport, Texas, adjacent to the Freeport Customs and Border Protection port of entry;

Whereas, notice inviting public comment was given in the **Federal Register** (80 FR 58464, September 29, 2015) and the application has been processed pursuant to the FTZ Act and the Board's regulations; and,

Whereas, the Board adopts the findings and recommendation of the examiner's report, and finds that the requirements of the FTZ Act and the Board's regulations are satisfied;

Now, Therefore, the Board hereby orders:

The application to expand FTZ 149—Site 1 under the ASF is approved, subject to the FTZ Act and the Board's regulations, including Section 400.13, to the Board's standard 2,000-acre activation limit for the zone.

Signed at Washington, DC, this 29th day of 2016.

Ronald K. Lorentzen,

Acting Assistant Secretary of Commerce for Enforcement and Compliance, Alternate Chairman, Foreign-Trade Zones Board.

[FR Doc. 2016–18784 Filed 8–8–16; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

Foreign-Trade Zones Board

[Order No. 2011]

Reorganization of Foreign-Trade Zone 103 Under Alternative Site Framework Grand Forks, North Dakota

Pursuant to its authority under the Foreign-Trade Zones Act of June 18, 1934, as amended (19 U.S.C. 81a–81u), the Foreign-Trade Zones Board (the Board) adopts the following Order:

Whereas, the Board adopted the alternative site framework (ASF) (15 CFR Sec. 400.2(c)) as an option for the establishment or reorganization of zones;

Whereas, the Grand Forks Regional Airport Authority, grantee of Foreign-Trade Zone 103, submitted an application to the Board (FTZ Docket B–27–2016, docketed May 2, 2016) requesting to reorganize under the ASF with a service area of Grand Forks County, North Dakota, in and adjacent to the Grand Forks U.S. Customs and Border Protection port of entry, and to remove existing Sites 1, 2 and 3 from the zone;

Whereas, notice inviting public comment was given in the **Federal Register** (81 FR 27410–27411, May 6, 2016) and the application has been processed pursuant to the FTZ Act and the Board's regulations; and,

Whereas, the Board adopts the findings and recommendations of the examiner's report, and finds that the requirements of the FTZ Act and the Board's regulations are satisfied;

Now, Therefore, the Board hereby orders:

The application to reorganize FTZ 103 under the ASF is approved, subject to the FTZ Act and the Board's regulations, including Section 400.13, and to the Board's standard 2,000-acre activation limit for the zone.

Signed at Washington, DC, this 29th day of July 2016.

Ronald K. Lorentzen,

Acting Assistant Secretary of Commerce for Enforcement and Compliance, Alternate Chairman, Foreign-Trade Zones Board.

[FR Doc. 2016–18789 Filed 8–8–16; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XE74

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Waterfront Improvement Projects

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments.

SUMMARY: NMFS has received a request from the U.S. Department of the Navy (Navy) for authorization to take marine mammals incidental to construction activities as part of waterfront improvement projects at several berths. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting public comment on its proposal to issue an incidental harassment authorization (IHA) to the Navy to incidentally take marine mammals, by Level B harassment only, during the specified activity at Portsmouth Naval Shipyard (the Shipyard) in Kittery, Maine.

DATES: Comments and information must be received no later than September 8, 2016.

ADDRESSES: Comments on the application should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service. Physical comments should be sent to 1315 East-West Highway, Silver Spring, MD 20910, and electronic comments should be sent to *ITP.Pauline@noaa.gov.*

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments received electronically, including all attachments, must not exceed a 25-megabyte file size. Attachments to electronic comments will be accepted in Microsoft Word or Excel or Adobe PDF file formats only. All comments received are a part of the public record and will generally be posted to the Internet at *http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm* without change. All personal identifying information (*e.g.,* name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Rob Pauline, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of the Navy's application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at: *www.nmfs.noaa.gov/pr/permits/incidental/construction.htm.* In case of problems accessing these documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**).

National Environmental Policy Act

The Navy has prepared a draft Environmental Assessment (*Waterfront Improvement Projects, Portsmouth Naval Shipyard, Kittery, ME*) in accordance with the National Environmental Policy Act (NEPA) and the regulations published by the Council on Environmental Quality. NMFS will independently evaluate the Environmental Assessment (EA) and determine whether or not to adopt it. We may prepare a separate NEPA analysis and incorporate relevant portions of Navy's EA by reference. Information in the Navy's application, EA, and this notice collectively provide the environmental information related to proposed issuance of this IHA for public review and comment. These documents will be posted at the foregoing Web site. We will review all comments submitted in response to this notice as we complete the NEPA process, including a decision of whether to sign a Finding of No Significant Impact (FONSI), prior to a final decision on the incidental take authorization request.

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined ''negligible impact'' in 50 CFR 216.103 as ''an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.''

Except with respect to certain activities not pertinent here, the MMPA defines ''harassment'' as: Any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Summary of Request

On Wednesday February 17, 2016, NMFS received an application from the Navy for the taking of marine mammals incidental to Waterfront Improvement Projects. NMFS determined that the application was adequate and complete on April 1, 2016. The Navy is proposing to restore and modernize waterfront infrastructure associated with Dry Docks 1 and 3 at the Shipyard in Kittery, York County, Maine. The proposed action would include two waterfront improvement projects, structural repairs to Berths 11, 12, and 13, and replacement of the Dry Dock 3 caisson. The waterfront improvement projects would be constructed between October 2016 and October 2022, with in-water work expected to begin no earlier than January 2017. The requested IHA would run from January 1, 2017 through December 31, 2017.

The use of vibratory and impact pile driving for pile installation and removal as well as drilling is expected to produce underwater sound at levels that have the potential to result in behavioral harassment of marine mammals. The term ''pile driving'' throughout this document shall include vibratory driving, impact pile driving, vibratory pile extraction as well as pile drilling unless unless specified otherwise. Species with the potential to be present during the project timeframe include harbor porpoise (*Phocoena phocoena*), gray seal (*Halichoerus grypus*), harbor seal (*Phoca vitulina*), hooded seal (*Crystphora cristata*) and harp seal (*Pagophilus groenlandicus*).

Description of the Specified Activity

Overview

The U.S. Department of the Navy (Navy) is proposing to restore and modernize waterfront infrastructure associated with Dry Docks 1 and 3 at the Shipyard in Kittery, York County, Maine (See Figure 1–1 in the Application). The proposed action would include two waterfront improvement projects, structural repairs to Berths 11, 12, and 13 and replacement of the Dry Dock 3 caisson.

The purpose of the proposed action is to modernize and maximize dry dock capabilities for performing current and future missions efficiently and with maximum flexibility. The need for the proposed action is to correct deficiencies associated with the pier structure at Berths 11, 12, and 13 and the Dry Dock 3 caisson and concrete seats and ensure that the Shipyard can continue to support its primary mission to service, maintain, and overhaul submarines. By supporting the Shipyard's mission, the proposed action would assist in meeting the larger need for the Navy to provide capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. Proposed activities included as part of the Waterfront Improvement Projects with potential to affect marine mammals within the waterways adjacent to the Shipyard include vibratory and impact pile driving as well as pile drilling operations in the project area.

Dates and Duration

In-water construction associated with the Proposed Action would occur in phases over a six-year construction period. In-water construction is scheduled to begin in January 2017 and be completed by October 2022. This application is for the first year of in-water construction, from January 1, 2017 to December 31, 2017. No seasonal limitations would be imposed on the construction timeline. Construction schedules for in-water work at Berth 11 are under development and subject to change based on operational requirements. Therefore, this IHA application covers all in-water construction planned for Berth 11 structural repairs. The Navy intends to apply for sequential IHAs to cover each of the subsequent years of construction.

Table 1 summarizes the in-water construction activities including pile extraction, driving, and drilling, scheduled to take place during the timeframe covered by this IHA application. Note that pile driving days are not necessarily consecutive. Also note that certain activities may occur at the same time, decreasing the total number of pile driving days, thus making the total days described below a conservative estimate. Total driving time will be approximately 72 days which includes the installation of 327 piles and removal of 141 piles.

TABLE 1—ACTIVITY SUMMARY FOR YEAR 1 OF THE BERTHS 11, 12, AND 13 STRUCTURAL REPAIRS

Activity/method	Timing	Number of days	Pile type	Number of piles installed	Number of piles extracted
Extract timber piles/vibratory hammer	January 2017 to December 2017.	[1] 10	15-inch timber pile		77
Install temporary sister piles for trestle system/vibratory hammer.	January 2017 to December 2017.	[2] 16	14-inch steel H-type	64	
Install permanent king piles for bulkhead/auger drilling.	January 2017 to December 2017.	10	36-inch steel H-type piles.	94	
Install steel sheet-pile bulkhead/vibratory hammer (sheet piles and sheet pile returns).	January 2017 to December 2017.	6	24-inch steel sheet-piles.	112	
Install permanent sister piles/impact hammer.	January 2017 to December 2017.	[2] 13	14-inch steel H-type	50	
Install timber dolphin	January 2017 to January 2017.	[1] 1	15-inch timber piles	7	
Extract temporary sister piles for trestle system/vibratory hammer.	January 2017 to December 2017.	[2] 16	14-inch steel H-type		64
Totals		72		327	141

[1] Estimate based on assumption of 30 minutes to drive each pile and 30-minute transition and set up time, resulting in one pile per hour and eight piles per day (ICF Jones and Strokes and Illingworth and Rodkin, Inc. 2012).

[2] Estimate based on assumption of a one-hour transition and set up time, resulting in one pile per two hours and four piles per day (ICF Jones and Strokes and Illingworth and Rodkin, Inc. 2012).

Note: The Navy provided the following information in response to technical questions:
King Piles—estimate of 10 per day.
Sheet piles—estimate of 20 per day, based on 20 piles in 8 hours (*i.e.,* one day) because they will be installed two at a time.

Specified Geographic Region

The Shipyard is located along the Piscataqua River in Kittery, Maine. The Shipyard occupies the whole of Seavey Island, encompassing 278 acres on what were originally five separate islands (Seavey, Pumpkin, Dennett's, Clarks, and Jamaica). Over the past 200 years, as a result of expansion from land-making activity, four of these islands (Seavey, Pumpkin, Dennett's, and Jamaica) were consolidated into one large island, which kept the name Seavey Island. Clarks Island is now attached to Seavey Island by a causeway. Seavey Island is located in the lower Piscataqua River approximately 547 yards from its southwest bank, 219 yards from its north bank, and approximately 2.5 miles from the mouth of the river.

Detailed Description of Activities

The Navy's application focuses primarily on the in-water construction activities that will occur during the first year of construction, including completion of the king pile and concrete shutter panel bulkhead at Berth 11. Additional applications will be submitted for each subsequent year of in-water construction at Berths 11, 12, and 13 as well as for the replacement of the Dry Dock 3 caisson.

Pile Driving Operations

Piles of differing sizes will be utilized during construction activities including 25-inch steel sheet piles driven by vibratory hammer at Berth 11; 14-inch steel H-type piles driven using impact hammer at Berth 11; 15-inch timber piles installed via vibratory hammer to reconstruct dolphins at the corner of Berth 11; and 36-inch steel H-type piles at Berth 11. Additionally 14-inch steel H-type piles would be used to align and construct the trestle that would be extracted using vibratory hammer at Berth 11 and 15-inch timber fender piles, which would be extracted using a vibratory hammer at Berth 11 and the timber dolphin at the corners of Berths 11 and 12.

The number of piles that can be driven per day varies for different project elements and is subject to change based on site conditions at the time. At the beginning of the in-water work, existing timber piles would be removed from the berth faces and the timber dolphin at the western end of the berth, and the contractor either would construct a temporary construction trestle or place a jack-up barge alongside the berths to provide additional construction workspace. Pile driving and extraction would also be needed to construct and disassemble the temporary construction trestle if the construction contractor selects this method over use of a jack-up barge, which would require no pile driving. The trestle system has been included in this analysis in order to model a conservative, worst-case scenario. If a jack-up barge is used instead of a trestle system, less pile driving will be needed, resulting in fewer marine mammal takes than predicted in this application.

For the proposed king pile and concrete shutter panel bulkhead (see Figures 2–1 and 2–2 in Application), the contractor would likely create templates and work in increments along the berth from the trestle or jack-up barge. For example, an approximately 50-foot-long template would allow installation of about 10 king piles and 20 sheet piles (along segments of the berths where sheet piles would be installed). The work would consist of setting a template (including temporary piles and horizontal members), which might take one or two days. Then the contractor would drill the rock sockets, which could take about one day per socket. King piles would be regularly spaced along the berths and grouted into sockets drilled into the bedrock (*i.e.,* ''rock-socketed'').

The concrete shutter panels would then be installed in stacks between the king piles along most of the length of Berth 11. Installation of the concrete piles is not included in the noise analysis because no pile driving would be required. Along an approximately 16-foot section at the eastern end of Berth 11A and an additional 101 feet between Berths 11A and 11B, the depth to bedrock is greater, thus allowing a conventional sheet-pile bulkhead to be constructed. The steel sheet-piles would be driven to bedrock using a vibratory hammer. Sheet piles installed with a vibratory hammer also would be used to construct ''returns,'' which would be shorter bulkheads connecting the new bulkheads to the existing bulkhead under the pier. Installation of the sheeting with a vibratory hammer is estimated to take less than one hour per pair of sheets. The contractor would probably install two sheets at a time and so the time required install the sheeting (10 pairs = 20 sheets) using vibratory hammers would only be about 8 hours per 10 pairs of sheets. Time requirements for all other pile types were estimated based on information compiled from ICF Jones and Strokes and Illingworth and Rodkin, Inc. (2012).

If sufficient construction funds are available, the Navy may install a king pile and concrete shutter panel bulkhead at Berth 11C as part of Phase 1. The bulkhead would extend from the western end of Berth 11B to the southern end of Berth 12. The in-water construction process would be the same as the process described above. The analysis in this application includes construction at Berth 11C. Once the Berth 11 bulkheads are complete, the timber dolphins at the western end of the berth would be replaced with a similar dolphin constructed of approximately seven piles.

Additional in-water work would be required to install steel H-type sister piles at the location of the inboard portal crane rail beam at Berth 11, including Berth 11C. The sister piles would provide additional support for the portal crane rail system and restore its load-bearing capacity. The sister piles would be driven into the bedrock below the pier, in water generally less than 10 feet deep, using an impact hammer. The timing of this work depends on operational schedules at the berths. The sister piles may be installed either before or after the bulkheads are constructed.

Description of Marine Mammals in the Area of the Specified Activity

Five marine mammal species, including one cetacean and four pinnipeds, may inhabit or transit the waters near the Shipyard in the lower Piscataqua River during the specified activity. These include the harbor porpoise (*Phocoena phocoena*), Gray seal (*Halichoerus grypus*), harbor seal (*Phoca vitulina*), hooded seal (*Crystphora cristata*), and harp seal (*Pagophilus groenlandicus*). None of the marine mammals that may be found in the Piscataqua River are listed under the Endangered Species Act (ESA). Table 2 lists the marine mammal species that could occur in the vicinity of the Shipyard and their estimated densities within the Project area. As there are not specific density data for any of the species in the Piscataqua River, density data from the nearshore zone outside the mouth the Piscataqua River in the Atlantic Ocean have been used instead. Therefore, it can be assumed that the density estimates presented here for each species are conservative and much higher than densities that would typically be expected in an estuarine environment such as the lower Piscataqua River in the vicinity of the Shipyard.

TABLE 2—MARINE MAMMAL SPECIES POTENTIALLY PRESENT IN THE PISCATAQUA RIVER IN THE VICINITY OF THE SHIPYARD

Species	Stock(s) abundance [1]	Relative occurrence in Piscataqua River	Season(s) of occurrence	Approximate density in the vicinity of the project area (individuals per km²) [3]			
				Winter	Spring	Summer	Fall
Harbor Porpoise, *Phocoena phocoena*, Gulf of Maine/Bay of Fundy stock.	79,883 (CV = 0.32)	Occasional use	Spring to Fall (April to December). [4]	1.2122	1.1705	0.7903	0.9125
Gray Seal, *Halichoerus grypus*, Western North Atlantic stock.	331,000 [2]	Common	Year-round	0.2202	0.2202	0.2202	0.2202
Harbor Seal, *Phoca vitulina*, Western North Atlantic stock.	75,834 (CV = 0.15)	Common	Year-round	0.1998	0.1998	0.1998	0.1998
Hooded Seal, *Crystphora cristata*, Western North Atlantic stock.	592,100 [2]	Rare	Winter to Spring (January–May).	N/A	N/A	N/A	N/A
Harp Seal, *Pagophilus groenlandicus*, Western North Atlantic stock.	7,100,000	Rare	Winter to Spring (January–May).	0.0125	0.0125	0.0125	0.0125

Source: Waring *et al.*, 2015, except where noted.
Notes:
[1] No population estimate is available for the U.S. western North Atlantic stock; therefore, the best population estimates are those for the Canadian populations as reported in Waring *et al.*, 2015.
[2] Source: Waring *et al.*, 2007. The population estimate for the Western North Atlantic hooded seal population was not updated in Waring *et al.*, 2015.
[3] Density data are taken from the Navy Marine Species Density Database (Crain 2015; Krause 2015). It should be noted that these data overestimate the potential species density in the Piscataqua River. The Navy Marine Species Density Database data presented in the table are based on a relative environmental suitability study and represent data with low confidence. These data are generally used for broad-scale offshore activities; however, due to a lack of any other data within the general Project area, these data are presented as the best available data for the Piscataqua River.
[4] Densities shown for seasons when each species would not be likely to occur in the river.
Key: CV = coefficient of variation. km² = square kilometer.

We have reviewed the Navy's detailed species descriptions, including life history information, for accuracy and completeness and refer the reader to Section 3 of the Navy's Application instead of reprinting the information here. Please also refer to NMFS' Web site (*www.nmfs.noaa.gov/pr/species/mammals*) for generalized species accounts.

Harbor Porpoise

Harbor porpoises are found commonly in coastal and offshore waters of both the Atlantic and Pacific Oceans. In the western North Atlantic, the species is found in both U.S. and Canadian waters. More specifically, the species can be found between West Greenland and Cape Hatteras, North Carolina (NOAA Fisheries Service

2014a). Based on genetic analysis, it is assumed that harbor porpoises in the U.S. and Canadian waters are divided into four populations, as follows: (1) Gulf of St. Lawrence; (2) Newfoundland; (3) Greenland; and (4) Gulf of Maine/Bay of Fundy. For management purposes in U.S. waters, harbor porpoises have been divided into 10 stocks along both the East and West Coasts. Of those 10 stocks, only one, the Gulf of Maine/Bay of Fundy stock, is found along the U.S. East Coast, and thus only individuals from this stock could be found in the Project area. The species is primarily found over the Continental Shelf in waters less than approximately 500 feet deep (Waring *et al.*, 2014). In general, the species is commonly found in bays, estuaries, and harbors (NOAA Fisheries Service 2014a).

Line-transect surveys have been conducted in the Gulf of Maine between 1991 and 2011. Based on the 2011 aerial surveys, the best abundance estimate for the Gulf of Maine/Bay of Fundy stock of harbor porpoise is 79,883 animals (CV = 0.32). The aerial surveys included central Virginia to the lower Bay of Fundy. The minimum population estimate is 61,415 animals (Waring *et al.*, 2014). Because no trend analysis has been conducted for this stock, no population trend is available. A Bayesian population model was used to determine the currently accepted population growth rate. Fertility data and age-at-death data from stranded animals and animals taken in gillnets were used for the model (Waring *et al.*, 2014). It was then determined that the potential natural growth rate for the Gulf of Maine/Bay of Fundy stock of harbor porpoises was 0.046 (Waring *et al.*, 2014). The harbor porpoise is likely the most abundant cetacean within the Piscataqua River (Smith n.d.)

Gray Seal

Gray seals, which are members of the ''true seal'' family (*Phocidae*), are a coastal species that generally remains within the Continental Shelf region. Gray seals can be found on both sides of the North Atlantic. Within this area, the species is split into three primary populations: (1) Eastern Canada, (2) northwestern Europe, and (3) the Baltic Sea (Katona *et al.*, 1993). Gray seals within U.S. waters are considered the western North Atlantic stock and are expected to be part of the eastern Canadian population (Waring *et al.*, 2014). In U.S. waters, year-round breeding of approximately 400 animals has been documented on areas of outer Cape Cod and Mukeget Island in Massachusetts. In general, this species can be found year-round in the coastal waters of the Gulf of Maine (Waring *et al.*, 2014).

There are currently no population estimates for the western North Atlantic gray seal stock (Waring *et al.*, 2014). However, estimates are available for portions of the total population for certain time periods (Waring *et al.*, 2014). For example, between 1993 and 2004, the Gray seal population in Canada was estimated at between 144,000 and 223,220 individuals. This estimate was based on three separate surveys and also depended on the population-estimation model that was used (Mohn and Bowen 1996; Department of Fisheries and Oceans 2003; Trzcinski *et al.*, 2005). The most recent Canadian gray seal population estimate is 331,000. This estimate is based on surveys conducted during 2012 in the Gulf of St. Lawrence, Nova Scotia Eastern Shore, and Sable Island (Waring *et al.*, 2014). In U.S. waters, gray seals are known to pup at three separate locations: (1) Muskeget Island, Massachusetts; (2) Green Island, Maine; and (3) Seal Island, Maine. Surveys of these areas indicate that in these colonies pup production is increasing, as are the colony populations. General population increases in U.S. waters are likely a result of this natural increase and immigration of individuals from Canadian populations (Waring *et al.*, 2014).

Harbor Seal

Harbor seals are also members of the true seal family (*Phocidae*) and can be found in nearshore waters along both the North Atlantic and North Pacific coasts, generally at latitudes above 30° N. (Burns 2009). In the western Atlantic Ocean, the harbor seal's range extends from the eastern Canadian Arctic to New York; however, they can be found as far south as the Carolinas (Waring *et al.*, 2014). In New England, the species can be found in coastal waters year-round (Waring *et al.*, 2014). Overall, there are five recognized subspecies of harbor seal, two of which occur in the Atlantic Ocean. The western Atlantic harbor seal (*Phoca vitulina concolor*) is the subspecies likely to occur in the project area. There is some uncertainly about the overall population stock structure of harbor seals in the western North Atlantic Ocean. However, it is theorized that harbor seals along the eastern U.S. and Canada are all from a single population (Temte *et al.*, 1991).

An aerial abundance survey was conducted in 2012 during the pupping season along the entire Maine coast. As a result of this survey, the best estimate of abundance for the western North Atlantic stock of harbor seal was 70,142 animals. The minimum population was estimated as 55,409 animals (also based on the 2012 aerial abundance survey). No trend analysis has been conducted for this species, likely because of the long interval between the 2012 survey and the previous 2001 survey and the somewhat imprecise abundance estimates that were generated from them. In the Piscataqua River, harbor seals are the most abundant pinniped species (Smith n.d.).

Hooded Seal

Hooded seals are also members of the true seal family (*Phocidae*) and are generally found in deeper waters or on drifting pack ice. The world population of hooded seals has been divided into three stocks, which coincide with specific breeding areas, as follows: (1) Northwest Atlantic, (2) Greenland Sea, and (3) White Sea (Waring *et al.*, 2007). The hooded seal is a highly migratory species, and its range can extend from the Canadian arctic to Puerto Rico. In the U.S. waters, the species has an increasing presence in the coastal waters between Maine and Florida (Waring *et al.*, 2007). In the United States, they are considered members of the western North Atlantic stock and generally occur in New England waters from January through May and further south in the summer and fall seasons (Waring *et al.*, 2007).

Population abundance of hooded seals in the western North Atlantic is derived from pup production estimates. These estimates are developed from whelping pack surveys. The most recent population estimate in the western North Atlantic was derived in 2005. There have been no recent surveys conducted or population estimates developed for this species. The 2005 best population estimate for hooded seals is 592,100 individuals, with a minimum population estimate of 512,000 individuals (Waring *et al.*, 2007). Currently, not enough data are available to determine what percentage of this estimate may represent the population within U.S. waters. A population trend also cannot be developed for this species due to a lack of sufficient data. Hooded seals are known to occur in the Piscataqua River; however, they are not as abundant as the more commonly observed harbor seal. Anecdotal sighting information indicates that two hooded seals were observed from the Shipyard in August 2009, but no other observations have been recorded (Trefry November 20, 2015).

Harp Seal

Harp seals are also members of the true seal family and classified into three stocks, which coincide with specific pupping sites on pack ice, as follows: (1) Eastern Canada, including the areas off the coast of Newfoundland and Labrador and the area near the Magdalen Islands in the Gulf of St. Lawrence; (2) the West Ice off eastern Greenland, and (3) the ice in the White Sea off the coast of Russia (Waring *et al.*, 2014). The harp seal is a highly migratory species, and its range can extend from the Canadian arctic to New Jersey. In U.S. waters, the species has an increasing presence in the coastal waters between Maine and New Jersey (Waring *et al.*, 2014). In the United States, they are considered members of the western North Atlantic stock and generally occur in New England waters from January through May in the winter and spring (Waring *et al.*, 2014). The observed influx of harp seals and geographic distribution in New England to mid-Atlantic waters is based primarily on strandings and secondarily on fishery bycatch.

Population abundance of harp seals in the western North Atlantic is derived from aerial surveys and mark-recapture (Waring *et al.*, 2014). The most recent population estimate in the western North Atlantic was derived in 2012 from an aerial harp seal survey. The 2012 best population estimate for hooded seals is 7.1 million individuals (Waring *et al.*, 2014). Currently, not enough data are available to determine what percentage of this estimate may represent the population within U.S. waters. A population trend also cannot be developed for this species due to a lack of sufficient data, as recent increases in strandings may not be indicative of population size. Harp seals are known to occur in the Piscataqua River; however, they are not as abundant as the more commonly observed harbor seal (Crain 2015).

Potential Effects of the Specified Activity on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that stressors, (*e.g.*, pile driving,) and potential mitigation activities, associated with the proposed waterfront improvement project may impact marine mammals and their habitat. The ''Estimated Take by Incidental Harassment'' section later in this document will include a quantitative analysis of the number of individuals that are expected to be taken by this activity. The ''Negligible Impact Analysis'' section will include the analysis of how this specific activity will impact marine mammals and will consider the content of this section, the ''Estimated Take by Incidental Harassment'' section, and the ''Proposed Mitigation'' section to draw conclusions regarding the likely impacts of this activity on the reproductive success or survivorship of individuals and from that on the affected marine mammal populations or stocks. In the following discussion, we provide general background information on sound and marine mammal hearing before considering potential effects to marine mammals from sound produced by pile driving.

Description of Sound Sources

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz (Hz) or cycles per second. Wavelength is the distance between two peaks of a sound wave; lower frequency sounds have longer wavelengths than higher frequency sounds and attenuate (decrease) more rapidly in shallower water. Amplitude is the height of the sound pressure wave or the 'loudness' of a sound and is typically measured using the decibel (dB) scale. A dB is the ratio between a measured pressure (with sound) and a reference pressure (sound at a constant pressure, established by scientific standards). It is a logarithmic unit that accounts for large variations in amplitude; therefore, relatively small changes in dB ratings correspond to large changes in sound pressure. When referring to sound pressure levels (SPLs; the sound force per unit area), sound is referenced in the context of underwater sound pressure to 1 microPascal (μPa). One pascal is the pressure resulting from a force of one newton exerted over an area of one square meter. The source level (SL) represents the sound level at a distance of 1 m from the source (referenced to 1 μPa). The received level is the sound level at the listener's position. Note that all underwater sound levels in this document are referenced to a pressure of 1 μPa and all airborne sound levels in this document are referenced to a pressure of 20 μPa.

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Rms is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Rms accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in all directions away from the source (similar to ripples on the surface of a pond), except in cases where the source is directional. The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound. Ambient sound is defined as environmental background sound levels lacking a single source or point (Richardson *et al.*, 1995), and the sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.*, waves, earthquakes, ice, atmospheric sound), biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.*, vessels, dredging, aircraft, construction). A number of sources contribute to ambient sound, including the following (Richardson *et al.*, 1995):

- *Wind and waves:* The complex interactions between wind and water surface, including processes such as breaking waves and wave-induced bubble oscillations and cavitation, are a main source of naturally occurring ambient noise for frequencies between 200 Hz and 50 kHz (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Surf noise becomes important near shore, with measurements collected at a distance of 8.5 km from shore showing an increase of 10 dB in the 100 to 700 Hz band during heavy surf conditions.
- *Precipitation:* Sound from rain and hail impacting the water surface can become an important component of total noise at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times.
- *Biological:* Marine mammals can contribute significantly to ambient noise levels, as can some fish and shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz.

• *Anthropogenic:* Sources of ambient noise related to human activity include transportation (surface vessels and aircraft), dredging and construction, oil and gas drilling and production, seismic surveys, sonar, explosions, and ocean acoustic studies. Shipping noise typically dominates the total ambient noise for frequencies between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly (Richardson *et al.*, 1995). Sound from identifiable anthropogenic sources other than the activity of interest (*e.g.*, a passing vessel) is sometimes termed background sound, as opposed to ambient sound.

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise ''ambient'' or ''background'' sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10–20 dB from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

In the vicinity of the Project area, the average broadband ambient underwater noise levels are commonly 52.8 to 80.5 dB SEL re 1μPa with substantially higher maximum peak readings (79.9 to 103.9 L_{peak} dB re 1μPa) due to passing boats and industrial noise (ESS Group, Inc. 2015). However, boat traffic was limited the day of the study; three boats passed at a distance greater than 66 yards from site. Therefore, given the short duration of the measurements, it would be difficult to determine whether vessel noise associated with the Proposed Action would add greatly to the existing background vessel noise in the lower Piscataqua River. However, based on these measurements, it cannot be assumed that the sound produced by vibratory pile driving would be completely masked by background vessel noise, especially in areas close to the vibratory hammer.

There are two general categories of sound types: Impulse and non-pulse. Vibratory pile driving is considered to be continuous or non-pulsed while impact pile driving is considered to be an impulse or pulsed sound type. The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.,* (2007) for an in-depth discussion of these concepts.

Pulsed sound sources (*e.g.,* explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986; Harris, 1998; NIOSH, 1998; ISO, 2003; ANSI, 2005) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or non-continuous (ANSI, 1995; NIOSH, 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems (such as those used by the U.S. Navy). The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak SPLs may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.,* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

TABLE 3—REPRESENTATIVE SOUND LEVELS OF ANTHROPOGENIC SOURCES

Sound source	Frequency range (Hz)	Underwater sound level	Reference
Small vessels	250–1,000	151 dB rms at 1 m	Richardson *et al.,* 1995.
Tug docking gravel barge	200–1,000	149 dB rms at 100 m	Blackwell and Greene, 2002.
Vibratory driving of 72-in steel pipe pile	10–1,500	180 dB rms at 10 m	Reyff, 2007.
Impact driving of 36-in steel pipe pile	10–1,500	195 dB rms at 10 m	Laughlin, 2005.
Impact driving of 66-in cast-in-steel-shell (CISS) pile	10–1,500	195 dB rms at 10 m	Reviewed in Hastings and Popper, 2005.

The likely or possible impacts of the proposed project on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of the equipment and personnel. Any impacts to marine mammals, however, are expected to primarily be acoustic in nature.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals, and exposure to sound can have deleterious effects. To appropriately assess these potential effects, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999). To reflect this, Southall *et al.,* (2007) recommended that marine mammals be divided into functional hearing groups based on measured or estimated hearing ranges on the basis of available behavioral data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. The lower and/or upper frequencies for some of these functional hearing groups have been modified from those designated by Southall *et al.,* (2007). The functional groups and the associated frequencies are indicated below (note that these frequency ranges do not necessarily correspond to the range of best hearing, which varies by species):

- *Low-frequency cetaceans (mysticetes):* Functional hearing is estimated to occur between approximately 7 Hz and 25 kHz (extended from 22 kHz; Watkins, 1986; Lucifredi and Stein, 2007; Ketten and Mountain, 2009; Tubelli *et al.,* 2012);
- *Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids):* Functional hearing is estimated to occur between approximately 150 Hz and 160 kHz;
- High-frequency cetaceans (porpoises, river dolphins, and members of the genera *Kogia* and *Cephalorhynchus;* now considered to include two members of the genus *Lagenorhynchus* on the basis of recent echolocation data and genetic data [May-Collado and Agnarsson, 2006; Kyhn *et al.,* 2009, 2010; Tougaard *et al.,* 2010]): Functional hearing is estimated to occur between approximately 200 Hz and 180 kHz; and
- *Pinnipeds in water:* Functional hearing is estimated to occur between approximately 75 Hz to 100 kHz for Phocidae (true seals) and between 100 Hz and 48 kHz for Otariidae (eared seals), with the greatest sensitivity between approximately 700 Hz and 20 kHz. The pinniped functional hearing group was modified from Southall *et al.,* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Kastelein *et al.,* 2009; Reichmuth *et al.,* 2013).

The single cetacean species likely to occur in the proposed project area and for which take is requested, is classified as a high-frequency cetacean (*i.e.,* harbor porpoise) (Southall *et al.,* 2007). Additionally, gray seals, harbor seals, hooded seals, and harp seals are classified as members of the phocid pinnipeds in-water functional hearing group.

Acoustic Effects, Underwater

Potential Effects of Pile Driving Sound—The effects of sounds from pile driving might result in one or more of the following: Temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, and masking (Richardson *et al.,* 1995; Gordon *et al.,* 2004; Nowacek *et al.,* 2007; Southall *et al.,* 2007). The effects of pile driving on marine mammals are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the pile driving sound; the depth of the water column; the substrate of the habitat; the standoff distance between the pile and the animal; and the sound propagation properties of the environment. Impacts to marine mammals from pile driving activities are expected to result primarily from acoustic pathways. As such, the degree of effect is intrinsically related to the received level and duration of the sound exposure, which are in turn influenced by the distance between the animal and the source. The further away from the source, the less intense the exposure should be.

The substrate and depth of the habitat affect the sound propagation properties of the environment. Shallow environments are typically more structurally complex, which leads to rapid sound attenuation. In addition, substrates that are soft (*e.g.,* sand) would absorb or attenuate the sound more readily than hard substrates (*e.g.,* rock) which may reflect the acoustic wave. Soft porous substrates would also likely require less time to drive the pile, and possibly less forceful equipment, which would ultimately decrease the intensity of the acoustic source. Much of the shoreline in the project area has been characterized as hard shores (rocky intertidal). In general, rocky intertidal areas consist of bedrock that alternates between marine and terrestrial habitats, depending on the tide. Rocky intertidal areas are characterized by bedrock, stones, or boulders that singly or in combination cover 75 percent or more of an area that is covered less than 30 percent by vegetation.

In the absence of mitigation, impacts to marine species would be expected to result from physiological and behavioral responses to both the type and strength of the acoustic signature (Viada *et al.,* 2008). The type and severity of behavioral impacts are more difficult to document due to limited studies addressing the behavioral effects of impulse sounds on marine mammals. Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.,* 1973).

Hearing Impairment and Other Physical Effects—Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges (Kastak *et al.,* 1999; Schlundt *et al.,* 2000; Finneran *et al.,* 2003, 2005). TS can be permanent (PTS), in which case the loss of hearing sensitivity is not recoverable, or temporary (TTS), in which case the animal's hearing threshold would recover over time (Southall *et al.,* 2007). Marine mammals depend on acoustic cues for vital biological functions, (*e.g.,* orientation, communication, finding prey, avoiding predators); thus, TTS may result in reduced fitness in survival and reproduction. However, this depends on the frequency and duration of TTS, as well as the biological context in which it occurs. TTS of limited duration, occurring in a frequency range that does not coincide with that used for recognition of important acoustic cues, would have little to no effect on an animal's fitness. Repeated sound exposure that leads to TTS could cause PTS. PTS constitutes injury, but TTS does not (Southall *et al.,* 2007). The following subsections discuss in somewhat more detail the possibilities of TTS, PTS, and non-auditory physical effects.

Temporary Threshold Shift—TTS is the mildest form of hearing impairment that can occur during exposure to a strong sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises, and a sound must be stronger in order to be heard. In terrestrial mammals, TTS can last from minutes or hours to days (in cases of strong TTS). For sound exposures at or somewhat above the TTS threshold, hearing sensitivity in both terrestrial and marine mammals recovers rapidly after exposure to the sound ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals, and none of the published data concern TTS elicited by exposure to multiple pulses of sound. Available data on TTS in marine mammals are summarized in Southall *et al.,* (2007).

Given the available data, the received level of a single pulse (with no frequency weighting) might need to be approximately 186 dB re 1 μPa^2-s (*i.e.,* 186 dB sound exposure level [SEL] or approximately 221–226 dB p-p [peak]) in order to produce brief, mild TTS.

Exposure to several strong pulses that each have received levels near 190 dB rms (175–180 dB SEL) might result in cumulative exposure of approximately 186 dB SEL and thus slight TTS in a small odontocete, assuming the TTS threshold is (to a first approximation) a function of the total received pulse energy (Southall *et al.* 2007).

The above TTS information for odontocetes is derived from studies on the bottlenose dolphin (*Tursiops truncatus*) and beluga whale. There is no published TTS information for other species of cetaceans. However, preliminary evidence from a harbor porpoise exposed to pulsed sound suggests that its TTS threshold may have been lower (Lucke *et al.,* 2009). Furthermore, harbor porpoise are high frequency hearing specialists so they are not as sensitive to lower frequency sounds produced by pile driving as much as belugas and bottlenose dolphins are. As summarized above, data that are now available imply that TTS is unlikely to occur unless odontocetes are exposed to pile driving pulses stronger than 180 dB re 1 μPa rms.

Permanent Threshold Shift—When PTS occurs, there is physical damage to the sound receptors in the ear. In severe cases, there can be total or partial deafness, while in other cases the animal has an impaired ability to hear sounds in specific frequency ranges (Kryter, 1985). There is no specific evidence that exposure to pulses of sound can cause PTS in any marine mammal. However, given the possibility that mammals close to a sound source can incur TTS, it is possible that some individuals might incur PTS. Single or occasional occurrences of mild TTS are not indicative of permanent auditory damage, but repeated or (in some cases) single exposures to a level well above that causing TTS onset might elicit PTS.

Relationships between TTS and PTS thresholds have not been studied in marine mammals but are assumed to be similar to those in humans and other terrestrial mammals, based on anatomical similarities. PTS might occur at a received sound level at least several decibels above that inducing mild TTS if the animal were exposed to strong sound pulses with rapid rise time. Based on data from terrestrial mammals, a precautionary assumption is that the PTS threshold for impulse sounds (such as pile driving pulses as received close to the source) is at least 6 dB higher than the TTS threshold on a peak-pressure basis and probably greater than 6 dB (Southall *et al.,* 2007). On an SEL basis, Southall *et al.,* (2007) estimated that received levels would need to exceed the TTS threshold by at least 15 dB for there to be risk of PTS. Thus, for cetaceans, Southall *et al.,* (2007) estimate that the PTS threshold might be an M-weighted SEL (for the sequence of received pulses) of approximately 198 dB re 1 μPa^2-s (15 dB higher than the TTS threshold for an impulse). Given the higher level of sound necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

Although no marine mammals have been shown to experience TTS or PTS as a result of being exposed to pile driving activities, captive bottlenose dolphins and beluga whales exhibited changes in behavior when exposed to strong pulsed sounds (Finneran *et al.,* 2000, 2003, 2005). The animals tolerated high received levels of sound before exhibiting aversive behaviors. Experiments on a beluga whale showed that exposure to a single watergun impulse at a received level of 207 kPa (30 psi) p-p, which is equivalent to 228 dB p-p, resulted in a 7 and 6 dB TTS in the beluga whale at 0.4 and 30 kHz, respectively. Thresholds returned to within 2 dB of the pre-exposure level within four minutes of the exposure (Finneran *et al.,* 2003). Although the source level of pile driving from one hammer strike is expected to be much lower than the single watergun impulse cited here, animals being exposed for a prolonged period to repeated hammer strikes could receive more sound exposure in terms of SEL than from the single watergun impulse (estimated at 188 dB re 1 μPa^2-s) in the aforementioned experiment (Finneran *et al.,* 2003). However, in order for marine mammals to experience TTS or PTS, the animals have to be close enough to be exposed to high intensity sound levels for a prolonged period of time. Based on the best scientific information available, these SPLs are far below the thresholds that could cause TTS or the onset of PTS.

Non-auditory Physiological Effects—Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to strong underwater sound include stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007). Studies examining such effects are limited. In general, little is known about the potential for pile driving to cause auditory impairment or other physical effects in marine mammals. Available data suggest that such effects, if they occur at all, would presumably be limited to short distances from the sound source and to activities that extend over a prolonged period. The available data do not allow identification of a specific exposure level above which non-auditory effects can be expected (Southall *et al.,* 2007) or any meaningful quantitative predictions of the numbers (if any) of marine mammals that might be affected in those ways. Marine mammals that show behavioral avoidance of pile driving, including some odontocetes and some pinnipeds, are especially unlikely to incur auditory impairment or non-auditory physical effects.

Disturbance Reactions

Disturbance includes a variety of effects, including subtle changes in behavior, more conspicuous changes in activities, and displacement. Behavioral responses to sound are highly variable and context-specific and reactions, if any, depend on species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day, and many other factors (Richardson *et al.,* 1995; Wartzok *et al.,* 2003; Southall *et al.,* 2007).

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.,* 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; NRC, 2003; Wartzok *et al.,* 2003).

Controlled experiments with captive marine mammals showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices, but also including pile driving) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; Thorson and Reyff, 2006; see also Gordon *et al.,* 2004; Wartzok *et al.,* 2003; Nowacek *et al.,* 2007). Responses to continuous sound, such as vibratory pile installation, have not been documented as well as responses to pulsed sounds.

With both types of pile driving, it is likely that the onset of pile driving could result in temporary, short term changes in an animal's typical behavior and/or avoidance of the affected area. These behavioral changes may include (Richardson *et al.,* 1995): Changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located; and/or flight responses (*e.g.,* pinnipeds flushing into water from haul-outs or rookeries). Pinnipeds may increase their haul-out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006).

The biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification could be expected to be biologically significant if the change affects growth, survival, or reproduction. Significant behavioral modifications that could potentially lead to effects on growth, survival, or reproduction include:

- Drastic changes in diving/surfacing patterns (such as those thought to cause beaked whale stranding due to exposure to military mid-frequency tactical sonar);
- Habitat abandonment due to loss of desirable acoustic environment; and
- Cessation of feeding or social interaction.

The onset of behavioral disturbance from anthropogenic sound depends on both external factors (characteristics of sound sources and their paths) and the specific characteristics of the receiving animals (hearing, motivation, experience, demography) and is difficult to predict (Southall *et al.,* 2007).

Auditory Masking

Natural and artificial sounds can disrupt behavior by masking, or interfering with, a marine mammal's ability to hear other sounds. Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher levels. Chronic exposure to excessive, though not high-intensity, sound could cause masking at particular frequencies for marine mammals that utilize sound for vital biological functions. Masking can interfere with detection of acoustic signals such as communication calls, echolocation sounds, and environmental sounds important to marine mammals. Therefore, under certain circumstances, marine mammals whose acoustical sensors or environment are being severely masked could also be impaired from maximizing their performance fitness in survival and reproduction. If the coincident (masking) sound were anthropogenic, it could be potentially harassing if it disrupted hearing-related behavior. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs only during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect.

Masking occurs at the frequency band which the animals utilize so the frequency range of the potentially masking sound is important in determining any potential behavioral impacts. Because sound generated from in-water vibratory pile driving is mostly concentrated at low frequency ranges, it may have less effect on high frequency echolocation sounds made by porpoises. However, lower frequency man-made sounds are more likely to affect detection of communication calls and other potentially important natural sounds such as surf and prey sound. It may also affect communication signals when they occur near the sound band and thus reduce the communication space of animals (*e.g.,* Clark *et al.,* 2009) and cause increased stress levels (*e.g.,* Foote *et al.,* 2004; Holt *et al.,* 2009).

Masking affects both senders and receivers of the signals and can potentially have long-term chronic effects on marine mammal species and populations. Recent research suggests that low frequency ambient sound levels have increased by as much as 20 dB (more than three times in terms of SPL) in the world's ocean from pre-industrial periods, and that most of these increases are from distant shipping (Hildebrand, 2009). All anthropogenic sound sources, such as those from vessel traffic, pile driving, and dredging activities, contribute to the elevated ambient sound levels, thus intensifying masking.

The most intense underwater sounds in the proposed action are those produced by impact pile driving. Given that the energy distribution of pile driving covers a broad frequency spectrum, sound from these sources would likely be within the audible range of marine mammals present in the project area. Impact pile driving activity is relatively short-term, with rapid pulses occurring for approximately fifteen minutes per pile. The probability for impact pile driving resulting from this proposed action masking acoustic signals important to the behavior and survival of marine mammal species is likely to be negligible. Vibratory pile driving is also relatively short-term, with rapid oscillations occurring for approximately one and a half hours per pile. It is possible that vibratory pile driving resulting from this proposed action may mask acoustic signals important to the behavior and survival of marine mammal species, but the short-term duration and limited affected area would result in insignificant impacts from masking. Any masking event that could possibly rise to Level B harassment under the MMPA would occur concurrently within the zones of behavioral harassment already estimated for vibratory and impact pile driving, and which have already been taken into account in the exposure analysis.

Acoustic Effects, Airborne

Marine mammals that occur in the project area could be exposed to airborne sounds associated with pile driving that have the potential to cause harassment, depending on their distance from pile driving activities. Airborne pile driving sound would not impact cetaceans because sound from atmospheric sources does not transmit well underwater (Richardson *et al.,* 1995); thus, airborne sound may only be an issue for pinnipeds either hauled-out or looking with heads above water in the project area. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled-out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon their habitat and move further from the source. Studies by Blackwell *et al.,* (2004) and Moulton *et al.,* (2005) indicate a tolerance or lack of response to unweighted airborne sounds as high as 112 dB peak and 96 dB rms. However, since there are no regular haul-outs in the vicinity of the site of the proposed project area, we believe that incidents of incidental take resulting from airborne sound or visual disturbance are unlikely.

Vessel Interaction

Besides being susceptible to vessel strikes, cetacean and pinniped responses to vessels may result in behavioral changes, including greater variability in the dive, surfacing, and respiration patterns; changes in vocalizations; and changes in swimming speed or direction (NRC 2003). There will be a temporary and localized increase in vessel traffic during construction.

Potential Effects on Marine Mammal Habitat

The proposed activities at Portsmouth Naval Shipyard would not result in permanent impacts to habitats used directly by marine mammals, but may have potential short-term impacts to food sources such as forage fish and may affect acoustic habitat (see masking discussion above). There are no known foraging hotspots or other ocean bottom structure of significant biological importance to marine mammals present in the marine waters of the project area. Therefore, the main impact issue associated with the proposed activity would be temporarily elevated sound levels and the associated direct effects on marine mammals, as discussed previously in this document. The most likely impact to marine mammal habitat would be the effect of pile driving on likely marine mammal prey (*i.e.,* fish) and minor impacts to the immediate substrate during installation and removal of piles.

Potential Pile Driving Effects on Prey

Construction activities may produce both pulsed (*i.e.,* impact pile driving) and continuous (*i.e.,* vibratory pile driving) sounds. Fish react to sounds which are especially strong and/or intermittent low-frequency sounds. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving (or other types of sounds) on fish, although several are based on studies in support of large, multiyear bridge construction projects (*e.g.,* Scholik and Yan, 2001, 2002; Popper and Hastings, 2009). Sound pulses at received levels of 160 dB re 1 μPa may cause subtle changes in fish behavior. SPLs of 180 dB may cause noticeable changes in behavior (Pearson *et al.,* 1992; Skalski *et al.,* 1992). SPLs of sufficient strength have been known to cause injury to fish and fish mortality. The most likely impact to fish from pile driving activities at the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. In general, impacts to marine mammal prey species are expected to be minor and temporary due to the short timeframe for the project.

Effects to Foraging Habitat

During the course of the proposed project, various activities are expected to disturb the sediment. These activities include pile driving, dredging, and filling. In order to minimize the amount of debris, sediment, and silt escaping when backfilling the Berth 11 bulkhead, the Navy will install geotextile fabric against the interior of the bulkhead to catch debris, sediment, and silt forced through seams in the bulkhead when the backfill is compacted. In addition, a temporary silt curtain and boom would be installed outside of Berth 11, approximately 18 feet off the berth, during backfilling to catch additional debris, sediment, and silt that escapes the bulkhead.

Pile driving and dredging activities may re-suspend disturbed sediment and result in turbid conditions within the immediate project area. Suspended sediments may be transported and re-deposited downstream of the prevailing currents, which could increase siltation in the vicinity of the Shipyard. Resulting sedimentation is also expected to be localized and temporary. Since the currents are so strong in the area, suspended sediments in the water column should dissipate and quickly return to background levels. Following the completion of sediment-disturbing activities, the turbidity levels within the temporary offshore workspace are expected to return to normal ambient levels following the end of construction in all construction scenarios. Turbidity within the water column has the potential to reduce the level of oxygen in the water and irritate the gills of cetacean or pinniped prey fish species in the project area. However, turbidity plumes associated with the project would be temporary and localized, and fish in the project area would be able to move away from and avoid the areas where plumes may occur. Therefore, it is expected that the impacts on prey fish species from turbidity, and therefore on marine mammals, would be minimal and temporary. In general, the area likely impacted by the project is relatively small compared to the available habitat in Great Bay Estuary. As a result, activity at the project site would be inconsequential in terms of its effects on marine mammal foraging.

In summary, given the short daily duration of sound associated with individual pile driving events and the relatively small areas being affected, pile driving activities associated with the proposed action are not likely to have a permanent, adverse effect on any fish habitat, populations of fish species or marine mammal foraging habitat at the project area. Furthermore, any impacts to marine mammal habitat that may occur are not expected to cause significant or long-term consequences for individual marine mammals or their populations.

Proposed Mitigation Measures

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, ''and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking'' for certain subsistence uses. NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat. 50 CFR 216.104(a)(11). For the proposed project, the Navy worked with NMFS and proposed the following mitigation measures to minimize the potential impacts to marine mammals in the project vicinity. The primary purposes of these mitigation measures are to minimize sound levels from the activities, and to monitor marine mammals within designated zones of influence corresponding to NMFS' current Level A and B harassment thresholds which are depicted in Table 9 found later in the *Estimated Take by Incidental Harassment* section.

In addition to the measures described later in this section, the Navy would employ the following standard mitigation measures:

Time Restrictions—Pile driving/removal (vibratory as well as impact), drilling, and vibratory extraction will only be conducted during daylight hours.

Establishment of Shutdown Zone—During pile driving and removal, the shutdown zone shall include all areas where the underwater SPLs are anticipated to equal or exceed the Level A (injury) harassment criteria for marine mammals (180 dB rms isopleth for cetaceans; 190 dB rms isopleth for pinnipeds). During all pile driving and removal activities, regardless of predicted SPLs, the entire Level A zone, or shutdown zone, will be monitored to prevent injury to marine mammals from their physical interaction with construction equipment during in-water activities. Pile driving or removal operations will cease if a marine mammal approaches the zone. Pile driving/removal operations will restart once the marine mammal is visibly seen leaving the Level A zone, or after 15 minutes have passed with no sightings

During all in-water construction or demolition activities having the potential to affect marine mammals, a shutdown zone of 10 m will be implemented to ensure marine mammals are not present within this zone. These activities could include, but are not limited to: (1) Pile driving and removal and the the removal of a pile from the water column/substrate via a crane (*i.e.,* a ''dead pull''). These precautionary measures would also further reduce the possibility of auditory injury and behavioral impacts as well as limit the unlikely possibility of injury from direct physical interaction with construction operations. For in-water heavy machinery work other than pile driving (using, *e.g.,* standard barges, tug boats), if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.

Establishment of Disturbance Zone or Zone of Influence—Disturbance zones or zones of influence (ZOI) are the areas in which SPLs equal or exceed 160 dB rms for impact driving and 120 dB rms for vibratory driving. Disturbance zones provide utility for monitoring conducted for mitigation purposes (*i.e.,* shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area but outside the shutdown zone and thus prepare for potential shutdowns of activity. However, the primary purpose of disturbance zone monitoring is for documenting incidents of Level B harassment; disturbance zone monitoring is discussed in greater detail later (see ''Proposed Monitoring and Reporting''). Nominal radial distances for disturbance zones are shown in Table 9 in this Notice. Due to the increased costs associated with monitoring the entire Level B zone, or buffer zone, the zone will be monitored during two-thirds of all pile driving days. If a marine mammal is observed entering the buffer zone, an exposure would be recorded and behaviors documented. The Navy will extrapolate data collected during monitoring days and extrapolate and calculate total takes for all pile driving days.

All shutdown and disturbance zones will initially be based on the distances from the source that were predicted for each threshold level.

Soft Start—The use of a soft start procedure is believed to provide additional protection to marine mammals by providing a warning and/ or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. The Navy will use soft-start techniques (ramp-up/dry fire) recommended by NMFS for impact driving. Soft start must be conducted at beginning of day's activity and at any time pile driving has ceased for more than 30 minutes. For impact hammer driving, contractors are required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent 3-strike sets. The 30-second waiting period is proposed based on the Navy's recent experience and consultation with NOAA Fisheries Service on a similar project at Naval Base Kitsap at Bangor (Department of the Navy 2010).

Monitoring Protocols

Visual Marine Mammal Observation—The Navy will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of activity. All observers will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. The Navy will monitor the shutdown zone and disturbance zone before, during, and after pile driving, with observers located at the best practicable vantage points. Based on NMFS requirements, the Marine Mammal Monitoring Plan would implement the following procedures for pile driving and removal:

- *Impact Installation:* Monitoring will be conducted within the Level A harassment shutdown zone during all pile driving operations and the Level B harassment buffer zone during two-thirds of pile driving days. Monitoring will take place from 15 minutes prior to initiation through 30 minutes post-completion of pile driving/removal activities.
- A minimum of two marine mammal observers (MMOs) will be in place during all pile-driving/removal operations. MMOs designated by the contractor will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to equipment operators. The MMOs shall have no other construction-related tasks while conducting monitoring and will be trained on the observation zones, species identification, how to observe, and how to fill out the data sheets by the Navy Natural Resources Manager prior to any pile driving activities.
- The Navy shall conduct a pre-construction briefing with the contractor. During the briefing, all contractor personnel working in the Project area will watch the Navy's Marine Species Awareness Training video. An informal guide will be included with the monitoring plan to aid in identifying species if they are observed in the vicinity of the Project area.
- Prior to the start of pile driving/ removal activity, the shutdown and safety zones will be monitored for 15 minutes to ensure that they are clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to remain in the disturbance zone and their behavior will be monitored and documented.
- In the unlikely event of conditions that prevent the visual detection of marine mammals, such as heavy fog, activities with the potential to result in Level A or Level B harassment will not be initiated. Pile driving would be curtailed, but vibratory pile driving or extraction would be allowed to continue if such conditions arise after the activity has begun.
- The waters will continue to be scanned for at least 30 minutes after pile driving has completed each day.

Mitigation Conclusions

NMFS has carefully evaluated the applicant's proposed mitigation measures and considered a range of other measures in the context of ensuring that NMFS prescribes the means of affecting the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another:

- The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals;
- The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and
- The practicability of the measure for applicant implementation.

Any mitigation measure(s) prescribed by NMFS should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

1. Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

2. A reduction in the numbers of marine mammals (total number or number at biologically important time or location) exposed to received levels of pile driving, or other activities expected to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

3. A reduction in the number of times (total number or number at biologically important time or location) individuals would be exposed to received levels of pile driving, or other activities expected to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

4. A reduction in the intensity of exposures (either total number or number at biologically important time or location) to received levels of pile driving, or other activities expected to result in the take of marine mammals (this goal may contribute to a, above, or to reducing the severity of harassment takes only).

5. Avoidance or minimization of adverse effects to marine mammal habitat, paying special attention to the food base, activities that block or limit passage to or from biologically important areas, permanent destruction of habitat, or temporary destruction/disturbance of habitat during a biologically important time.

6. For monitoring directly related to mitigation—an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, our preliminarily determination is that the proposed mitigation measures provide the means of effecting the least practicable impact on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an ITA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth, ''requirements pertaining to the monitoring and reporting of such taking.'' The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for ITAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. The Navy submitted a marine mammal monitoring plan as part of the IHA application. It can be found in Section 13 of the application. *http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm.*

Monitoring measures prescribed by NMFS should accomplish one or more of the following general goals:

1. An increase in the probability of detecting marine mammals, both within the mitigation zone (thus allowing for more effective implementation of the mitigation) and in general to generate more data to contribute to the analyses mentioned below;

2. An increase in our understanding of how many marine mammals are likely to be exposed to levels of pile driving that we associate with specific adverse effects, such as behavioral harassment, TTS, or PTS;

3. An increase in our understanding of how marine mammals respond to stimuli expected to result in take and how anticipated adverse effects on individuals (in different ways and to varying degrees) may impact the population, species, or stock (specifically through effects on annual rates of recruitment or survival) through any of the following methods:

▪ Behavioral observations in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict received level, distance from source, and other pertinent information);

▪ Physiological measurements in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict received level, distance from source, and other pertinent information);

▪ Distribution and/or abundance comparisons in times or areas with concentrated stimuli versus times or areas without stimuli;

4. An increased knowledge of the affected species; and

5. An increase in our understanding of the effectiveness of certain mitigation and monitoring measures.

Acoustic Monitoring

The Navy will implement in situ acoustic monitoring efforts to measure SPL from in-water construction activities. The Navy will collect and evaluate acoustic sound record levels for 10 percent of the pile-driving activities conducted, sufficient to confirm measured contours associated with the acoustic ZOIs. Acoustic sound recordings will be collected sufficient to document sound source levels for 10 percent of the proposed piles to be driven and extracted. The Navy will conduct acoustic monitoring at the source (33 feet) and, where the potential for Level A harassment exists, at a second representative monitoring location at an intermediate distance between the cetacean and pinniped shutdown zones. In conjunction with measurements of SPLs at the source and shutdown monitoring locations, there will also be intermittent verification for impact driving or pile driving and extraction to determine the actual distance to either the 120 dB re 1μPa rms isopleth or the point at which the SPL (maximum rms) from the equipment diminishes to the median ambient SPL (rms) and hence becomes indistinguishable. Acoustic measurements will continue during subsequent years of in-water construction for the Project.

Visual Marine Mammal Observations

The Navy will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of construction. All observers will be trained in marine mammal identification and behaviors. NOAA Fisheries Service requires that the observers have no other construction-related tasks while conducting monitoring.

The Navy will monitor the shutdown zone and safety zone before, during, and after pile driving activities. Based on NOAA Fisheries Service requirements, the Marine Mammal Monitoring Plan would include the following procedures:

- MMOs will be primarily located on boats, docks, and piers at the best vantage point(s) in order to properly see the entire shut down zone(s);
- MMOs will be located at the best vantage point(s) to observe the zone associated with behavioral impact thresholds;
- During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals;
- Monitoring distances will be measured with range finders;
- Distances to animals will be based on the best estimate of the MMO, relative to known distances to objects in the vicinity of the MMO;
- Bearing to animals will be determined using a compass; and

• Pile driving activities will be curtailed under conditions of fog or poor visibility that might obscure the presence of a marine mammal within the shutdown zone;

Post-Activity Monitoring

Monitoring of the shutdown and disturbance zones will continue for 30 minutes following the completion of the activity.

Data Collection

MMOs will use NMFS' approved data forms. Among other pieces of information, the Navy will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. At a minimum, the following information would be collected on the sighting forms:

• Date and time that monitored activity begins or ends;
• Construction activities occurring during each observation period;
• Weather parameters (*e.g.,* percent cover, visibility);
• Water conditions (*e.g.,* sea state, tide state);
• Species, numbers, and, if possible, sex and age class of marine mammals;
• Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
• Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
• Locations of all marine mammal observations; and
• Other human activity in the area.

Reporting Measures

The Navy would provide NMFS with a draft monitoring report within 60 days prior to any subsequent authorization, whichever is sooner. A monitoring report is required before another authorization can be issued to the Navy. This report will detail the monitoring protocol, summarize the data recorded during monitoring, and estimate the number of marine mammals that may have been harassed. If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report must be submitted within 30 days after receipt of comments. The report should include data and information listed in Section 13.3 of the application.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury, serious injury or mortality (*e.g.,* ship-strike, gear interaction, and/or entanglement), the Navy shall immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Northeast/Greater Atlantic Regional Stranding Coordinator. The report would include the following information:

• Time, date, and location (latitude/longitude) of the incident;
• Name and type of vessel involved;
• Vessel's speed during and leading up to the incident;
• Description of the incident;
• Status of all sound source use in the 24 hours preceding the incident;
• Water depth;
• Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);
• Description of all marine mammal observations in the 24 hours preceding the incident;
• Species identification or description of the animal(s) involved;
• Fate of the animal(s); and
• Photographs or video footage of the animal(s) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with the Navy to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The Navy would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that the Navy discovers an injured or dead marine mammal, and the lead MMO determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.,* in less than a moderate state of decomposition as described in the next paragraph), the Navy would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Greater Atlantic Regional Stranding Coordinator. The report would include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with the Navy to determine whether modifications in the activities are appropriate.

In the event that the Navy discovers an injured or dead marine mammal, and the lead MMO determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), The Navy would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Greater Atlantic Regional Stranding Coordinator within 24 hours of the discovery. The Navy would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as: "any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment]."

All anticipated takes would be by Level B harassment resulting from pile driving and are likely to involve temporary changes in behavior. Physical injury or lethal takes are not expected due to the expected source levels and sound source characteristics associated with the activity, and the proposed mitigation and monitoring measures are expected to further minimize the possibility of such take.

Given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound, where NMFS believes take is likely.

The Navy has requested authorization for the incidental taking of small numbers of harbor porpoise, harbor seal, gray seal, hooded seal and harp seal that may result from vibratory and impact pile driving and removal during activities associated with the waterfront improvement project.

In order to estimate the potential incidents of take that may occur incidental to the specified activity, we must first estimate the extent of the sound field that may be produced by the activity and then consider in combination with information about marine mammal density or abundance in the project area. We first provide information on applicable sound thresholds for determining effects to marine mammals before describing the information used in estimating the sound fields, the available marine mammal density or abundance information, and the method of estimating potential incidences of take.

Sound Thresholds

We use generic sound exposure thresholds to determine when an activity that produces sound might result in impacts to a marine mammal such that a take by harassment might occur. To date, no studies have been conducted that explicitly examine impacts to marine mammals from pile driving sounds or from which empirical sound thresholds have been established. These thresholds (Table 4) are used to estimate when harassment may occur (*i.e.,* when an animal is exposed to levels equal to or exceeding the relevant criterion) in specific contexts; however, useful contextual information that may inform our assessment of effects is typically lacking and we consider these thresholds as step functions. NMFS is working to revise these acoustic guidelines; for more information on that process, please visit *www.nmfs.noaa.gov/pr/acoustics/guidelines.htm.*

TABLE 4—UNDERWATER INJURY AND DISTURBANCE THRESHOLD DECIBEL LEVELS FOR MARINE MAMMALS

Criterion	Criterion definition	Threshold *
Level A harassment	PTS (injury) **	190 dB RMS for pinnipeds. 180 dB RMS for cetaceans.
Level B harassment	Behavioral disruption for impulse noise (*e.g.,* impact pile driving)	160 dB RMS.
Level B harassment	Behavioral disruption for non-pulse noise (*e.g.,* vibratory pile driving, drilling).	120 dB RMS.***

* All decibel levels referenced to 1 micropascal (re: 1 µPa). Note all thresholds are based off root mean square (RMS) levels.
** PTS = Permanent Threshold Shift conservatively based on TTS (Temporary Threshold Shift) Distance to Sound Thresholds.

Underwater Sound Propagation Formula—Pile driving generates underwater noise that can potentially result in disturbance to marine mammals in the project area. Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments.

Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source. The formula for practical spreading transmission loss is TL = 10 log10 (R/10), where R is the distance from the source assuming the near source levels are measured at 10 meters (33 feet). This transmission loss model was used for piles being driven in a water depth less than approximately 3 meters (10 feet). Specifically, the model was used for the 14-inch H-type (sister) piles that would be driven using an impact hammer at Rail Beam 1 at Berth 11,12, and 13.

A practical spreading value of fifteen is often used in the absence of reliable data and under conditions where water increases with depth as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss (4.5 dB reduction in sound level for each doubling of distance) was used in water depths ranging from 3 meters to 15 meters which is the greatest depth at which pile driving activities will take place for this project. The formula for cylindrical spreading transmission loss is TL = 15 log10 (R/10), where R is the distance from the source assuming the near source levels are measured at 10 meters (33 feet).

This transmission loss model was used for the piles being driven (or drilled) in water depths of between approximately 10 and 50 feet. These pile types and sizes included:

- 25-inch steel sheet piles, which would be driven using a vibratory hammer at Berth 11.
- 14-inch steel H-type piles, which would be driven using an impact hammer at Berth 11during trestle alignment and construction.
- 15-inch timber piles, which would be installed using a vibratory hammer to reconstruct timber dolphins at the corner of Berths 11 and 12.
- 36-inch steel H-type (king) piles at Berth 11 which would be drilled and rock-socketed into the bedrock.

This model was also used for piles extracted in water depths of 10 to 50 feet and included:

- 14-inch steel H-type piles, which would be used to align and construct the trestle that would be extracted using a vibratory hammer at Berth 11.
- 15-inch timber fender piles, which would be extracted using a vibratory hammer at Berth 11 and the timber dolphin at the corners of Berths 11 and 12.

Source levels for the two pile driving methods that are proposed for use during the project were obtained from the ''Compendium of Pile Driving Sound Data,'' which is included as Appendix I to ''Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish'' (ICF Jones & Stokes and Illingworth & Rodkin, Inc. 2012). The information presented in the compendium is a compilation of sound pressure levels recorded during various in-water pile driving projects in California, Oregon, Washington, and Nebraska. The compendium is a commonly used reference document for pile driving source levels when analyzing impacts on protected species, including marine mammals, from pile driving activities.

Source levels were collected for the four types of piles that would be installed and two pile driving methods proposed for the project:

- 14-inch steel H-type piles will be used as sister piles to align and construct the trestle; installed via impact hammer.
- 15-inch timber piles will be used for re-installation of dolphins and installed via vibratory hammer.
- 25-inch steel sheet piles will be used for the bulkhead at Berth 11 and installed via vibratory hammer.

Reference source levels for the Project were determined using data for piles of similar sizes, the same pile driving method as that proposed for the Project, and at similar water depths. While the pile sizes and water depths chosen as proxies do not exactly match those for the Project, they are the closest matches available, and it is assumed that the source levels shown in Table 5 and 6 are the most representative for each pile type and associated pile driving method.

TABLE 5—SOURCE LEVELS FOR IN-WATER IMPACT HAMMER 14-INCH STEEL H-TYPE (SISTER) PILES

Pile size and pile type	Water depth (m)	Distance measured (m)	Peak (dB)	RMS (dB)	SEL (dB)	Location
12-inch Steel H-type pile—Thick	5	10	200	183	170	CA (Specific location unknown).
15-inch Steel H-type pile—Thick	3	10	195	180	170	Ballena Isle Marina, Alameda, CA, San Francisco Bay.
12- to 15-inch H-type pile—Thick (Average)	4	10	198	182	170	

Source: ICF Jones & Stokes and Illingworth & Rodkin, Inc. 2012.
Note: All source levels are referenced to 1 microPascal (re 1 µPa).
[1] As printed in source material.
Key: dB = decibel; m = meter; RMS = root mean square; SEL = sound exposure level.

TABLE 6—SOURCE LEVELS FOR IN-WATER VIBRATORY HAMMER 25-INCH STEEL SHEET PILES, 20-INCH STEEL SHEET PILES AND 15-INCH TIMBER PILES

Pile size and pile type	Water depth (m)	Distance measured (m)	Peak (dB)	RMS (dB)	SEL (dB)	Location
24-inch AZ* Steel Sheet [1]	15	10	177	163	162	Berth 23, Port of Oakland, CA.
24-inch AZ Steel Sheet [1]	15	10	175	162	162	Berth 30, Port of Oakland, CA.
24-inch AZ Steel Sheet [1]	15	10	177	163	163	Berth 35/37 Port of Oakland, CA.
24-inch AZ Steel Sheet—Typical [1]	15	10	175	160	160	CA (Specific location unknown).
24-inch AZ Steel Sheet—Loudest [1]	15	10	182	165	165	CA (Specific location unknown).
24-inch AZ Steel Sheet (Average) [1]	15	10	178	163	163	
15-inch Timber Pile [2]	10	16	164	150	NP	WSF Port Townsend Ferry Terminal, WA.

Source:
[1] ICF Jones & Stokes and Illingworth & Rodkin, Inc. 2012.
[2] WSDOT 2010.

The exact source level for a given pile and pile driving method largely depends not only on the pile size and water depth but also on site-specific conditions such as environmental and physical factors, including water temperature and sediment composition. Therefore, in this analysis, several source levels for each pile type and associated pile driving method were averaged when multiple levels were available. These averaged source levels were used as inputs to determine transmission loss, which, in turn, was used in the propagation models described above.

Drilling

Drilling is considered an intermittent, non-impulsive noise source, similar to vibratory pile driving. Very little information is available regarding source levels of in-water drilling activities associated with nearshore pile installation such as that proposed for the Berths 11, 12, and 13 structural repairs project. Dazey *et al.,* (2012) attempted to characterize the source levels of several marine pile-drilling activities. One such activity was auger drilling (including installation and removal of the associated steel casing). The average sound pressure levels re 1 µPa RMS were displayed for casing installation, auger drilling (inside the casing), and casing removal. For the purposes of this plan, it is assumed that the casing installation and removal activities would be conducted in a manner similar to that described in Dazey *et al.,* (2012), primarily via oscillation. These average source levels are reported in Table 7.

TABLE 7—AVERAGE SOURCE LEVELS FOR AUGER DRILLING ACTIVITIES DURING PILE INSTALLATION

Drilling activity	Water depth (m)	Distance measured (m)	RMS (dB)	Location
Casing Installation	1–5	1	157	Bechers Bay Santa Rosa Island, CA.
Auger Drilling	1–5	1	151	Bechers Bay Santa Rosa Island, CA.
Casing Removal	1–5	1	152	Bechers Bay Santa Rosa Island, CA.

Source: Dazey *et al.,* 2012.
Note: All source levels are referenced to 1 microPascal (re 1 µPa).

IHA applications for other construction projects have reported that, due to a lack of information regarding pile drilling source levels, it is generally assumed that pile drilling would produce less in-water noise than both impact and vibratory pile driving. Based on the general lack of information about these activities and the assumption that in-water noise from pile drilling would be less than either impact or vibratory pile driving, it is assumed that the source levels presented in Table 7 are the most applicable for acoustic impact analysis at Berths 11, 12, and 13. For the purposes of this proposed IHA we will conservatively assume that drilling has similar source levels as vibratory driving when calculating zones of influences.

Pile Extraction

Vibratory pile extraction is considered an intermittent, non-impulsive noise source. Little information is available specific to vibratory extraction for most types of piles. The source level for timber-pile extraction was obtained from ''Port Townsend Test Pile Project: Underwater Noise Monitoring Draft Final Report,'' prepared by Jim Loughlin for the Washington State Department of Transportation Office of Air Quality and Noise (WSDOT 2010) and is shown in Table 8.

Source levels for vibratory extraction of H-type piles were obtained from ''Underwater Acoustic Measurements of Vibratory Pile Driving at the Pipeline 5 Crossing in the Snohomish River, Everett, Washington,'' prepared by Greeneridge Science, Inc., for the City of Everett (Burgess *et al.,* 2005).

For vibratory pile extraction of the 24-inch steel sheet piles (used as a proxy for the 20-inch steel sheet piles that would be extracted at the circular, cellular cofferdam), the average value for the vibratory installation source levels from Table 6 was used. Sources including ICF Jones & Stokes and Illingworth & Rodkin, Inc. (2012) report the same values for vibratory installation and extraction, assuming that the two activities would produce similar source levels if water depth, pile size, and equipment remain constant.

Reference source levels for the project were determined using data for piles of similar size, the same extraction method as that proposed for the project, and at similar water depths. While the pile sizes and water depths chosen as proxies do not exactly match those for the project, they are the closest matches available, and it is assumed that the source levels shown in Table 8 and are representative of the vibratory pile extraction method used for the project.

TABLE 8—AVERAGE SOURCE LEVEL FOR VIBRATORY PILE EXTRACTION 15-INCH TIMBER FENDER PILES [1]

Pile size and pile type	Water depth (m)	Distance measured (m)	Peak (dB)	RMS (dB)	Location
15-inch Timber Fender Pile [2]	10m	16m	164	150	WSF Port, Townsend Ferry Terminal, WA.

Notes:
[1] All source levels are referenced to 1 microPascal (re 1 μPa).
[2] WSDOT 2010.

Zones of Influence

Attenuation distances to the NOAA Fisheries thresholds for Level B takes for pile driving are described in Table 9. These attenuation distances have been developed using the propagation models described above. Modeling was performed for each driving, drilling, installing, and removing activity described above using the depth-appropriate model. Activities that would result in the longest attenuation distances were selected as the worst-case sound exposure distances that would determine the ZOI for each project location.

TABLE 9—PILE DRIVING SOUND EXPOSURE DISTANCES

[In-water]

Drilling activity	Behavioral thresholds for cetaceans and pinnipeds	Propagation model	Attenuation distance to threshold
Vibratory Hammer	120 dB RMS	Practical Spreading Loss (3 m to 15 m water depth).	4.57 mi (7.35 km).
Impact Hammer	160 dB RMS	Cylindrical Spreading Loss (<3 m water depth).	0.984 mi (1.58 km).

Note: All source levels are referenced to 1 microPascal (re 1 μPa).

During vibratory hammer operation modeled sound would attenuate to 120 dB at approximately 4.57 miles from the Berth 11 Structural Repairs Project. During operation of the impact hammer, modeled sound would attenuate to 160 dB at approximately 0.98 miles from the Berths 11 Structural Repairs Project site. Note that these attenuation distances are based on sound characteristics in open water. The Project area is located in a river surrounded by topographic features and not in open water; therefore, given the numerous land features and islands within the vicinity of the Project sites in the Piscataqua River, these attenuation distances are extremely conservative.

No Level A takes are expected because attenuation out to the pinniped injury threshold of 190 dB rms is calculated at 5 feet (1.58 meters), and attenuation out to the 180 dB RMS injury threshold for cetaceans is calculated at 52 feet (15.8 meters). These very small areas can easily be monitored for marine mammals, and mitigative measures would be implemented to ensure that no Level A takes occur.

The ZOIs for each of the two separate sound sources (impact driving and vibratory driving/drilling) at Berth 11 are shown on Figure 6–1 in the application. Work would occur in phases over several years. All of the construction-related in-water sound occurring within the waters of these ZOIs would exceed the designated NOAA Fisheries thresholds for behavioral take. The ZOIs were used to calculate potential takes from each sound source and would be monitored during in-water work at Berth 11 to estimate actual harassment takes of marine mammals. The total area ensonified by these two sources is 0.36 square miles (mi^2) (233.4 acres).

The numerous topographic features present in and along the Piscataqua River would greatly limit the area that would be impacted from in-water sound. Sound from either source would be truncated with minimal attenuation. Due to the numerous islands and other land features at and around the site, the actual ZOIs for both the vibratory hammer and impact hammer are identical even though the calculated ZOIs are different. This is illustrated in Figure 6–1 in the Application.

No sound is expected to fully attenuate to the 120-decibel threshold for vibratory pile driving because topographic features (*e.g.* islands, shorelines) in the river would prevent attenuation to the full distance of 4.57 miles. Very little sound would reach the 160 dB threshold at the full distance of 0.984 miles for the impact hammer due to these same sound-blocking topographical features. The longest attenuation distance from the Berth 11 Project site would occur to the southeast where, during impact pile driving, sound would attenuate through the waters east of Pierce Island to the 160 dB threshold (a distance of 0.88 miles) at Goat Island (See Figure 6–1 in application). The actual ZOI used to estimate exposure excludes water areas blocked by topographical features.

Airborne Exposure

Airborne transmission loss was calculated using the spherical spreading model above. Using this model, the greatest possible distances to airborne harassment thresholds were estimated, using a source level of 111 dB 20 μPa rms for 24″ round steel piles, as 552.5 ft (168.3 m) to the 90 dB threshold for harbor seals and 174.5 ft (53.2 m) to the 100 dB threshold for all other seals. Other types of pile driving and extraction that would occur during the project would generate lower airborne sound pressures, with smaller distances and areas of potential disturbance, and for that reason are not considered further in this application. Since protective measures are in place out to the distances calculated for the underwater Level B thresholds, the distances for the airborne thresholds will be effectively covered by monitoring. The closest known haul-out site for seals within the Piscataqua River is 1.5 miles (2414 m) downstream of the Project area while the attenuation distance to the 90 dB threshold is 0.108 miles (174.5 m) and the 100 dB threshold is 0.033 miles (53.2 m). While there are no documented haul-outs, animals do occasionally haul-out on nearby rocks/jetties and could be flushed into the water. However, it is assumed that any hauled out animals within the disturbance zone will also enter the water and be exposed to underwater noise. Therefore, acoustic disturbance to pinniped resulting from airborne sound from pile driving and drilling are not considered further in this application.

The take calculations presented here relied on the best data currently available for marine mammal populations within close proximity to the Piscataqua River. There are not population data for any marine mammal species specifically within the Piscataqua River; however, the population data used are from the most recent NMFS Stock Assessment Reports (SAR) for the Atlantic Ocean. The most recent SAR population number was used for each species. The specific SAR used is discussed within each species take calculation in Sections 6.6.1 through 6.6.5 of the application. The formula was developed for calculating take due to pile driving, extraction, and drilling and applied to the species-specific noise-impact threshold. The formula is founded on the following assumptions:

- All piles to be installed would have a noise disturbance distance equal to the pile that causes the greatest noise disturbance.
- Pile driving could potentially occur every day of the in-water work window; however, it is estimated no more than a few hours of pile driving would occur per day.
- An individual can only be taken once per day due to sound from pile driving, whether from impact or vibratory pile driving, or vibratory extraction

The conservative assumption is made that all pinnipeds within the ZOI would be underwater during at least a portion of the noise generating activity and, hence, exposed to sound at the predicted levels.

The calculation for marine mammal takes is estimated by:

Take estimate = (n * ZOI) * X days of total activity

Where:

n = density estimate used for each species
X = number of days of pile driving, estimated based on the total number of piles and the average number of piles that the contractor can install per day.
ZOI = noise threshold zone of influence (ZOI) impact area

The calculation n * ZOI produces an estimate of the abundance of animals that could be present in the area of exposure per day. The abundance is then multiplied by the total number of days of pile driving to determine the take estimate. Because the estimate must be a whole number, this value was rounded up.

The ZOI impact area is the estimated range of impact on marine mammals during in-water construction. The ZOI is the area in which in-water sound would exceed designated NOAA Fisheries Service thresholds. The formula for determining the area of a circle (π * *radius*^{2}) was used to calculate the ZOI around each pile, for each threshold. The distances specified were used for the radius in the equation. The ZOI impact area does not encompass landforms that may occur within the circle. The ZOI also took into consideration the possible affected area of the Piscataqua River from the furthest pile driving/extraction site with attenuation due to land shadowing from islands in the river as well as the river shoreline.

Harbor Porpoise

Harbor porpoises may be present in the Project area during spring, summer, and fall, from April to December. Based on density data from the Navy Marine Species Density Database, their presence is highest in spring, decreases in summer, and slightly increases in fall. However, in general, porpoises are known to occasionally occur in the river. Average density for the predicted seasons of occurrence was used to determine abundance of animals that could be present in the area for exposure, using the equation abundance = n * ZOI. Estimated abundance estimate for harbor porpoises was 0.90 animals generated from the equation (0.9445 km^2 * 0.9578 animals/km^2). Therefore, the number of Level B harbor porpoises exposures within the ZOIs is (72 days * 0.90 animals/day) which equals 65 animals. Therefore, the total requested harbor seal takes is 65.

Gray Seal

Gray seals may be present year-round in the project vicinity, with constant densities throughout the year. Gray seals are less common in the Piscataqua River than the harbor seal. Average density for the predicted seasons of occurrence was used to determine abundance of animals that could be present in the area for exposure, using the equation abundance = n * ZOI. Estimated abundance for gray seals was 0.21/day generated from the equation (0.9445 km^2 * 0.2202 animals/km^2). The number of Level B harbor porpoises exposures within the ZOIs is (72 days * 0.21 animals/day) resulting in up to 15 Level B exposures of gray seals within the ZOIs. Total requested gray seal takes is 15.

Harbor Seal

Harbor seals may be present year-round in the project vicinity, with constant densities throughout the year. Harbor seals are the most common pinniped in the Piscataqua River near the Shipyard. Average density for the predicted seasons of occurrence was used to determine abundance of animals that could be present in the area for exposure, using the equation abundance = n * ZOI. Abundance for harbor seals was 0.19/day generated from the equation (0.9445 km^2 * 0.1998 animals/km^2). The number of Level B harbor seal exposures within the ZOIs is (72 days * 0.19 animals/day) resulting in 14 harbor seals. Therefore, total requested harbor seal takes is 14.

Harp Seal

Harp seals may be present in the Project vicinity during the winter and spring, from January through February. In general, harp seals are much rarer than the harbor seal and gray seal in the Piscataqua River. Average density for the predicted seasons of occurrence was used to determine abundance of animals that could be present in the area for exposure, using the equation abundance = n * ZOI. Abundance for harp seals was 0.012/day generated from the equation (0.9445 km^2 * 0.0125 km^2). The number of Level B harp seal exposures within the ZOI is (72 days * 0.012 animals/day) resulting in one Level B exposure. Therefore, the total requested harp seal takes is 1.

Hooded Seal

Hooded seals may be present in the project vicinity during the winter and spring, from January through May, though their exact seasonal densities are unknown. In general, hooded seals are much rarer than the harbor seal and gray seal in the Piscataqua River. Anecdotal sighting information indicates that two hooded seals were observed from the Shipyard in August 2009, but no other observations have been recorded (Trefry November 20, 2015). Average density for the predicted seasons of occurrence was used to determine abundance of animals that could be present in the area for exposure. Since the average density for hooded seals is unknown and the animal is described as being rare, no authorized take of hooded seals is requested.

The total numbers of takes proposed for the five marine mammal species that may occur within the Navy's project area during the duration of proposed in-water construction activities are presented in Table 10.

TABLE 10—CALCULATIONS FOR INCIDENTAL TAKE ESTIMATION

Species	Animals in ensonified area/day	Number of days of activity	Proposed authorized takes	
			Level A	Level B
Harbor Porpoise	0.90	72	0	65
Gray Seal	0.21	72	0	15
Harbor Seal	0.19	72	0	14
Harp Seal	0.012	72	0	1
Total Exposures				95

Analysis and Preliminary Determinations

Negligible Impact

Negligible impact is ''an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival'' (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of Level B harassment takes, alone, is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be ''taken'' through behavioral harassment, NMFS must consider other factors, such as the likely nature of any responses (their intensity, duration, etc.), the context of any responses (critical reproductive time or location, migration, etc.), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, effects on habitat, and the status of the species.

To avoid repetition, the discussion of our analyses applies to all the species listed in Table 2, given that the anticipated effects of this pile driving project on marine mammals are expected to be relatively similar in nature. There is no information about the size, status, or structure of any species or stock that would lead to a different analysis for this activity, else species-specific factors would be identified and analyzed.

Pile driving activities associated with the Navy's Waterfront Improvement Projects, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from underwater sounds generated from pile driving. Harassment takes could occur if individuals of these species are present in the ensonified zone when pile driving is happening.

No injury, serious injury, or mortality is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. The potential for these outcomes is minimized through the implementation of the following planned mitigation measures. The Navy will employ a ''soft start'' when initiating impact driving activities. Given sufficient ''notice'' through use of soft start, marine mammals are expected to move away from a pile driving source. The Navy will delineate and monitor shutdown and disturbance zones while the likelihood of marine mammal detection by trained observers is high under the environmental conditions described for waters around the project area. Furthermore, shutdowns will occur if animals come within 10 meters of operational activity to avoid injury, serious injury, or mortality. The Navy's proposed activities are localized and of relatively short duration. The total time duration will amount to approximately 72 days.

The project also is not expected to have significant adverse effects on affected marine mammals' habitat, as analyzed in detail in the ''Anticipated Effects on Marine Mammal Habitat'' section. No important feeding and/or reproductive areas for marine mammals are known to be near the proposed project area. Project-related activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

These localized Level B exposures may cause brief startle reactions or short-term behavioral modification by the animals. Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff, 2006; Lerma, 2014). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. These reactions and behavioral changes are expected to subside quickly when the exposures cease. The pile driving activities analyzed here are similar to, or less impactful than, numerous construction activities conducted in other similar locations, which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment. Repeated exposures of individuals to levels of sound that may cause Level B harassment here are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the species is unlikely to result in any significant realized decrease in fitness for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least practicable impact through use of mitigation measures described herein. Finally, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the project area while the activity is occurring.

In summary, the negligible impact analysis is based on the following: (1) The possibility of injury, serious injury, or mortality may reasonably be considered discountable; (2) the anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior; (3) the absence of any significant habitat within the project area, including rookeries, significant haul-outs, or known areas or features of special significance for foraging or reproduction; and (4) the anticipated efficacy of the proposed mitigation measures in reducing the effects of the specified activity. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only short-term effects on individuals. The specified activity is not expected to impact rates of recruitment or survival and will therefore have a negligible impact on those species.

Therefore, based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the Navy's proposed Waterfront Improvement Projects will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers

Table 11 illustrates the numbers of animals that could be exposed to Level B behavioral harassment thresholds from work associated with the proposed Waterfront Improvement Projects. The analyses provided represents <0.01% of the populations of these stocks that could be affected by Level B behavioral harassment. These are small numbers of marine mammals relative to the sizes of the affected species and population stocks under consideration.

TABLE 11—ESTIMATED NUMBER OF EXPOSURES AND PERCENTAGE OF STOCKS THAT MAY BE SUBJECT TO LEVEL B HARASSMENT

Species	Proposed authorized akes	Stock(s) abundance estimate	Percentage of total stock (percent)
Harbor Porpoise, Gulf of Maine/Bay of Fundy stock	65	79,883	<0.01
Gray Seal, Western North Atlantic stock	15	331,000	<0.01
Harbor Seal, Western North Atlantic stock	14	75,834	<0.01
Harp Seal, Western North Atlantic stock	1	7,100,000	<0.01

Based on the methods used to estimate take, and taking into consideration the implementation of the mitigation and monitoring measures, we preliminarily find that small numbers of marine mammals will be taken relative to the populations of the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act (ESA)

No species listed under the ESA are expected to be affected by these activities. Therefore, NMFS has determined that a section 7 consultation under the ESA is not required.

National Environmental Policy Act (NEPA)

The Navy has prepared a draft Environmental Assessment (*Waterfront Improvement Projects, Portsmouth Naval Shipyard, Kittery, ME*) in accordance with the National Environmental Policy Act (NEPA) and the regulations published by the Council on Environmental Quality. NMFS will independently evaluate the EA and determine whether or not to adopt it. We may prepare a separate NEPA analysis and incorporate relevant portions of Navy's EA by reference. Information in the Navy's application, EA, and this notice collectively provide the environmental information related to proposed issuance of this IHA for public review and comment. We will review all comments submitted in response to this notice as we complete the NEPA process, including a decision of whether to sign a Finding of No Significant Impact (FONSI), prior to a final decision on the incidental take authorization request.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to the Navy for Waterfront Improvements Projects at the Portsmouth Naval Shipyard in Kittery, Maine, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. The proposed IHA language is provided next.

1. This Incidental Harassment Authorization (IHA) is valid from January 1, 2017 through December 31, 2017.

2. This Authorization is valid only for in-water construction work associated with Waterfront Improvement Projects at the Portsmouth Naval Shipyard in Kittery, Maine.

3. General Conditions

(a) A copy of this IHA must be in the possession of the Navy, its designees, and work crew personnel operating under the authority of this IHA.

(b) The species authorized for taking are harbor porpoise (*Phocoena phocoena*), gray seal (*Halichoerus grypus*), harbor seal (*Phoca vitulina*), and harp seal (*Pagophilus groenlandicus*).

(c) The taking, by Level B harassment only, is limited to the species listed in condition 3(b). See Table 1 below:

TABLE 1—AUTHORIZED TAKE NUMBERS

Species	Authorized takes—Level A	Authorized takes—Level B
Harbor Porpoise	0	65
Gray Seal	0	15
Harbor Seal	0	14
Harp Seal	0	1

(d) The taking by injury (Level A harassment), serious injury, or death of any of the species listed in condition 3(b) of the Authorization or any taking of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA.

(e) The Navy shall conduct briefings between construction supervisors and crews, marine mammal monitoring team, and staff prior to the start of all in-water pile driving, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

4. Mitigation Measures

The holder of this Authorization is required to implement the following mitigation measures:

(a) Time Restriction: For all in-water pile driving activities, the Navy shall operate only during daylight hours.

(b) Pile Driving Weather Delays: Pile driving shall only take place when the entire ZOI is visible and can be adequately monitored. If conditions (*e.g.*, fog) prevent the visual detection of marine mammals, activities with the potential to result in Level A or Level B harassment will not be initiated. If such conditions arise after the activity has begun, impact pile driving would be curtailed, but vibratory pile driving or extraction would be allowed to continue.

(c) If a marine mammal approaches the shutdown zone during the course of pile driving/removal operations, pile driving shall be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal.

(d) Establishment of Level A and B Harassment (ZOI)

(i) For all pile driving, the Navy shall implement a minimum shutdown zone of 10 m radius around the pile. If a marine mammal comes within or approaches the shutdown zone, such operations will cease. See Table 9 for minimum radial distances required for Level A and Level B disturbance zones.

(e) Use of Soft-start

(i) The project shall utilize soft start techniques for impact pile driving. The Navy shall conduct an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 1-minute waiting period, then two subsequent three strike sets. Soft start shall be required for any impact driving, including at the beginning of the day, and at any time following a cessation of pile driving of thirty minutes or longer.

(ii) Whenever there has been downtime of 30 minutes or more without impact driving, the contractor shall initiate the driving with soft-start procedures described above.

(f) Standard mitigation measures

(i) For in-water heavy machinery work other than pile driving (using, *e.g.*, standard barges, tug boats), if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.

(g) Visual Marine Mammal Monitoring and Observation

(i) A minimum of two MMOs shall be in place at the best practicable vantage points.

(ii) Monitoring will be conducted during all impact driving activity and during two-thirds of all vibratory driving activity

(iii) MMOs shall begin observing for marine mammals within the Level A and Level B harassment zones for 15 minutes before in-water pile driving begins. If a marine mammal(s) is present within the 10 meter shutdown zone prior to pile driving or during the ''soft start'' the start of pile driving shall be delayed until the animal(s) leaves the 10 meter shutdown zone. Pile driving shall resume only after the MMOs have determined, through sighting or by waiting 15 minutes, that the animal(s) has moved outside of and is on a path away from the 10 meter shutdown zone.

(iv) The individuals shall scan the waters within each monitoring zone activity using binoculars (25x or equivalent), hand held binoculars (7x) and visual observation

(v) The waters shall continue to be scanned for at least 30 minutes after pile driving has completed each day.

5. Monitoring and Reporting

The holder of this Authorization is required to submit a draft report on all monitoring conducted under the IHA 60 days prior to the issuance of a subsequent authorization, A final report shall be prepared and submitted within thirty days following resolution of comments on the draft report from NMFS. This report must contain the informational elements described in the Monitoring Plan, at a minimum and shall also include:

(a) Acoustic Monitoring

(i) The Navy shall conduct acoustic monitoring to ensure source levels are in line what is expected and therefore the Level A and Level B zones are accurate.

(b) Data Collection

(i) For all marine mammal and acoustic monitoring, information shall be recorded as described in the Monitoring Plan.

(c) Reporting Measures

(i) In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA, such as an injury (Level A harassment), serious injury or mortality (*e.g.*, ship-strike, gear interaction, and/or entanglement), the Navy shall immediately cease the specified activities and the Navy shall report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Northeast/Greater Atlantic Regional Stranding Coordinator within 24 hours of the discovery. The report would include the following information:

1. Time, date, and location (latitude/longitude) of the incident;

2. Name and type of vessel involved;
3. Vessel's speed during and leading up to the incident, if applicable;
4. Description of the incident;
5. Status of all sound source use in the 24 hours preceding the incident;
6. Water depth;
7. Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, and visibility);
8. Description of all marine mammal observations in the 24 hours preceding the incident;
9. Species identification or description of the animal(s) involved;
10. Fate of the animal(s); and
11. Photographs or video footage of the animal(s) (if equipment is available).

(ii) Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with the Navy to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The Navy would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

(iii) In the event that the Navy discovers an injured or dead marine mammal, and the lead MMO determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.*, in less than a moderate state of decomposition as described in the next paragraph), the Navy shall report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Northeast/Greater Atlantic Regional Stranding hotline and/or by email to the Northeast/Greater Atlantic Regional Stranding Coordinator within 24 hours of the discovery. The report shall include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with the Navy to determine whether modifications in the activities are appropriate.

(iv) In the event that the Navy discovers an injured or dead marine mammal, and the lead MMO determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the Navy shall report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Northeast/Greater Atlantic Regional Stranding hotline and/or by email to the Northeast/Greater Atlantic Regional Stranding Coordinator within 24 hours of the discovery. The Navy would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

6. This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein, or if NMFS determines the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.

Request for Public Comments

NMFS requests comment on our analysis, the draft authorization, and any other aspect of the Notice of Proposed IHA for the Navy's Waterfront Improvement Projects at Portsmouth Navy Shipyard in Kittery, Maine. Please include with your comments any supporting data or literature citations to help inform our final decision on the Navy's request for an MMPA authorization.

Dated: August 3, 2016.

Donna S. Wieting,

Director, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 2016–18815 Filed 8–8–16; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XE785

Caribbean Fishery Management Council; Public Meeting

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of a public meeting.

SUMMARY: The Caribbean Fishery Management Council (Council) will hold its 157th meeting.

DATES: The meeting will be held on August 23–24, 2016. The Council will convene on Tuesday, August 23, 2016, from 9 a.m. to 5:30 p.m., and will reconvene on Wednesday, August 24, 2016, from 9 a.m. to 5 p.m.

ADDRESSES: The meeting will be held at the Condado Vanderbilt Hotel, Condado Avenue, Condado, San Juan, Puerto Rico.

FOR FURTHER INFORMATION CONTACT: Caribbean Fishery Management Council, 270 Muñoz Rivera Avenue, Suite 401, San Juan, Puerto Rico 00918; telephone: (787) 766–5926.

SUPPLEMENTARY INFORMATION: The Council will hold its 157th regular Council Meeting to discuss the items contained in the following agenda:

August 23, 2016, 9 a.m.–5:30 p.m.

○ Call to Order
○ Election of Officers
○ Adoption of Agenda
○ Consideration of 156th Council Meeting Verbatim Transcriptions
○ Executive Director's Report
○ Scientific and Statistical Committee Report—Dr. Richard Appeldoorn
  —Island Based Fishery Management Plans (IBFMPs)
  —Acceptable Biological Catch Control Rule
○ Island Based Fishery Management Plans (IBFMPs)
  —Goals and Objectives of IBFMPs
  —Review Action 1: Species to include for Federal Management in each IBFMP
  —Review Action 2: Review Consolidated List of Stocks, and Stock and Species Complexes
  —Review Action 3: Reference Points
  —Update SEDAR 46 U.S. Caribbean Data Limited Species-Southeast Fisheries Science Center
  —ABC Control Rule Work Group Report
  —Recommendations to the CFMC on ABC Control Rule
  —Consider Action 4: Framework Procedures for IBFMPs
  —Consider Essential Fish Habitat (EFH) Designation for New Species in the IBFMPs and 5-year Review of EFH FMP
○ CFMC Roadmap to Complete IBFMPs
○ Data Collection in the USVI—Ruth Gómez
○ Developing a Commercial Permit Program for the Snapper Unit 2 Fishery Operating in Puerto Rico EEZ Waters—Reconsideration of DRAFT Scoping Document

—PUBLIC COMMENT PERIOD—(5-minutes presentations)

August 24, 2016, 9 a.m.–5 p.m.

○ Timing of Accountability Measures
  —Results from Public Hearings
  Next Step: Consider taking final action/Review codified text
○ Development of Regulatory Amendment regarding ACL Overages and Application of Accountability Measures: Sector vs. Total ACL within a Fishery Management Unit
○ Reports to CFMC
  —Standing Committee for Recreational Sampling Plan Development
  —Connectivity Studies Seasonally Closed Areas off the West Coast of