ENVIRONMENTAL APPENDIX

Elizabeth River and Southern Navigation Improvements Draft Integrated General Reevaluation Report and Environmental Assessment

Appendix E – Biological Assessment

12 December 2017

U.S. Army Corps of Engineers
Norfolk District

THE PORT OF VIRGINIA®

ELIZABETH RIVER AND SOUTHERN BRANCH NAVIGATION IMPROVEMENTS

DRAFT Biological Assessment

Norfolk District
803 Front Street
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US Army Corps of Engineers ®

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1.0 INTRODUCTION, AUTHORITY, AND PURPOSE, AND NEED

The federal navigation channels from the Lamberts Bend to the Chesapeake Extension are authorized under the Norfolk Harbor and Channels, Virginia, Project, which is a single purpose deep draft navigation project located in Hampton Roads. The Hampton Roads Harbor is a 25-square-mile natural harbor serving the port facilities in the cities of Norfolk, Newport News, Portsmouth, Chesapeake, and Hampton in southeastern Virginia. Since its authorization in 1986, the Norfolk Harbor and Channels Project has been constructed in separable elements based on the needs of the port community and the financial capability of the non-federal sponsor, the Virginia Port Authority, agent of the Commonwealth of Virginia. The portion of the Norfolk Harbor and Channels being evaluated in this study are those from the Lamberts Bend to the Chesapeake Extension that are currently authorized to depths ranging from 45 to 35 feet and maintained to depths ranging from 40 to 35 feet.

The purpose of this investigation is to identify whether the authorized plan for the portion of the Norfolk Harbor and Channels from the Lamberts Bend to the Chesapeake Extension is still in the federal interest and to evaluate measures which would improve the operational efficiency of commercial vessels currently using the federal navigation channel and commercial vessels projected to use the federal navigation channel in the future.

The need for this investigation arises from inefficiencies currently experienced by commercial vessels that are projected to continue in the future.

2.0 PROJECT SCOPE

The project is located in in the Commonwealth of Virginia. The Elizabeth River is situated within Norfolk Harbor adjacent the Cities of Chesapeake, Norfolk, and Portsmouth. Norfolk Harbor is located in the southeastern part of the Commonwealth of Virginia at the southern end of Chesapeake Bay, midway on the Atlantic Seaboard, approximately 170 miles south of Baltimore, Maryland, and 220 miles north of Wilmington, North Carolina. The harbor is formed by the confluence of the James, Nansemond, and Elizabeth Rivers.

The project occurs on subaqueous land, which is owned by the Commonwealth of Virginia and the Craney Island Dredged Material Management Area (CIDMMA) which is owned and operated by the USACE. A future dredged material placement site, the Craney Island Eastern Expansion (CIEE) will be initially owned and operated by the USACE. The Virginia Marine Resources Commission manages state-owned subaqueous lands in Virginia. Dredged material may also be rehandled and disposed of at approved offsite facilities.

The project area for this project can be divided up into three channel segments: Segment 1, Segment 2, and Segment 3.

The remainder of the Norfolk Harbor and Channels and Anchorage F, which is shown in on Figure 1 in navy blue, is being evaluated for deepening and widening (widening is limited to meeting areas in the vicinity of the Thimble Shoal Channel), but is not part of this federal action or Biological Assessment. It will be a separate project and will be the subject of a separate Biological Assessment.

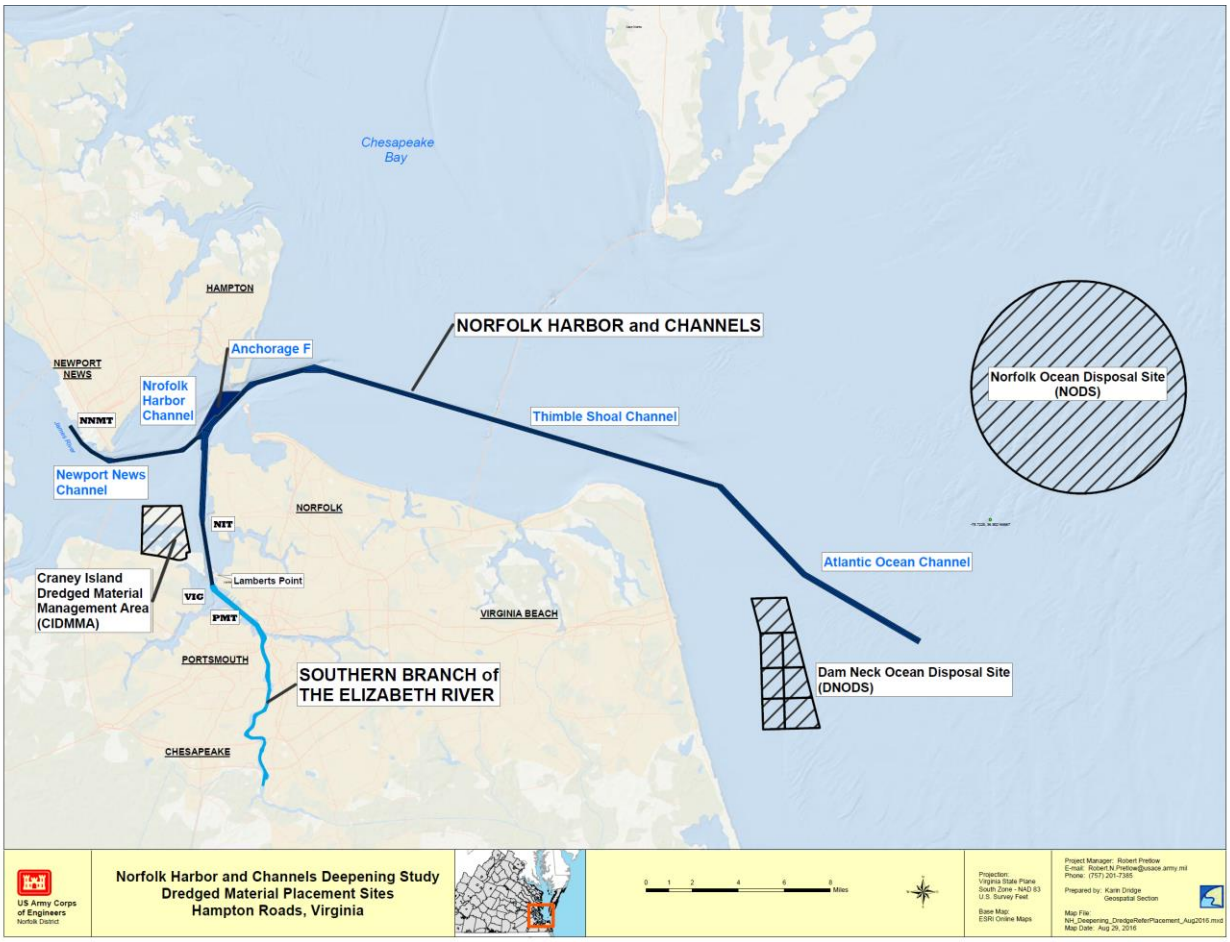

Figure 1. Location of the Norfolk Harbor and Channels from the Lamberts Bend to the Chesapeake Extension (light blue) is the subject of this Biological Assessment. The location of other portions of the Norfolk Harbor and Channels (navy blue) is shown for reference and the cumulative effects analysis.

2.1 CURRENT DREDGING AND DREDGED MATERIAL PLACEMENT/DISPOSAL PRACTICES

Segment 1

The authorized project dimensions for this segment (Figure 2) include a channel 45 feet deep and 750 feet wide from Lamberts Bend to the junction of the Southern and Eastern branches; thence 45 feet deep and 450 feet wide in the Southern Branch to the Norfolk & Portsmouth Beltline Railroad Bridge; including an approach and turning area 45 feet deep opposite the Norfolk Naval Shipyard; thence 45 feet deep and 375 feet wide to the North and West Railroad Bridge. The U.S. Army Corps of Engineers (USACE) maintained this segment to a depth of 40 feet under a previous project authorization. However, the Navy has already dredged and will maintain a portion of Segment 1, from Lamberts Bend to the Norfolk Naval Shipyard (NNSY). Specifically, for a length of three miles, it has dredged a 600-foot-width of the 750-foot width of federal channel from Lambert's Bend to the confluence of the Eastern and Southern Branches (the Elizabeth River Reach). From thence, for a length 2.0 miles, it has dredged a width of 450 feet, in keeping with the existing channel width, terminating at the Norfolk Naval Shipyard

(Southern Branch Lower Reach). The channel segment is maintained to a depth of 47 feet MLLW from Lamberts Point to the NNSY.

Material is dredged from this area via a hydraulic cutterhead pipeline dredge and/or a clamshell dredge. The dredged material removed from the Lamberts Bend to Paradise Creek is placed at Craney Island Dredged Material Management Area (CIDMMA). For the purpose of the project economic analysis this channel segment was divided into Segment 1a (north of the Perdue facility) and Segment 1b that portion of the federal channel south of Perdue (Figure 2).

Segment 2
This portion of the channel (Figure 3) is authorized to a depth of 40 feet, and maintained to 35 feet deep, and between 250 feet to 500 feet wide from the Norfolk Southern Railway Bridge to the U. S. Routes 460 and 13 Highway bridges. There is a turning basin at the mouth of St. Julians Creek, 40 feet deep, 400 to 600 feet long, and 800 feet wide; a turning basin not yet constructed at the mouth of Milldam Creek, 40 feet deep and 800 feet square.

Material is dredged via hydraulic cutterhead pipeline dredge and/or clamshell dredge. Dredged material removed from the Southern Branch Channel is placed at CIDMMA. The sediment composition of the Southern Branch Channel is roughly 25% sand, 45% silt, 30% clays.

Segment 3
This portion of the channel (Figure 4) is authorized to a depth of 35 feet and maintained to 35 feet deep from the Gilmerton Bridge to the Chesapeake Extension and includes the Mains Creek Turning Basin. Material is dredged via hydraulic cutterhead pipeline dredge and/or clamshell dredge. Dredged material removed from the Southern Branch Channel is placed at CIDMMA.

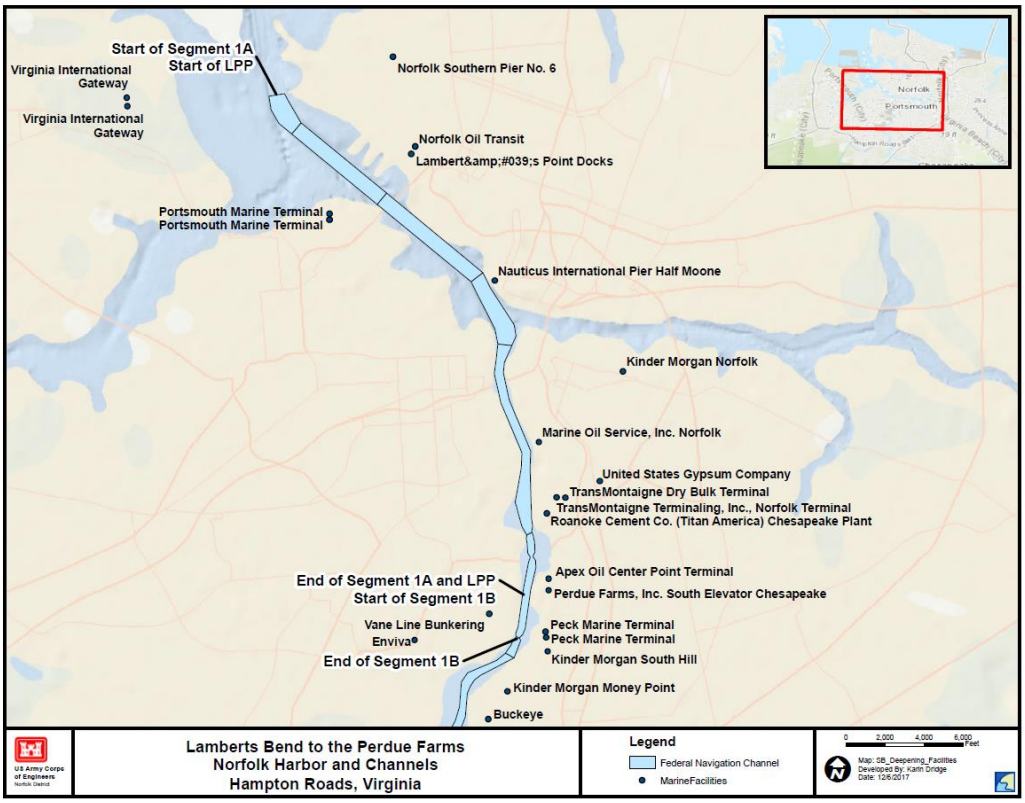

Figure 2. Segment 1a and Segment 1b. Elizabeth River and Southern Branch Navigation Improvements Project from Lamberts Bend to the Norfolk Southern Lift Bridge.

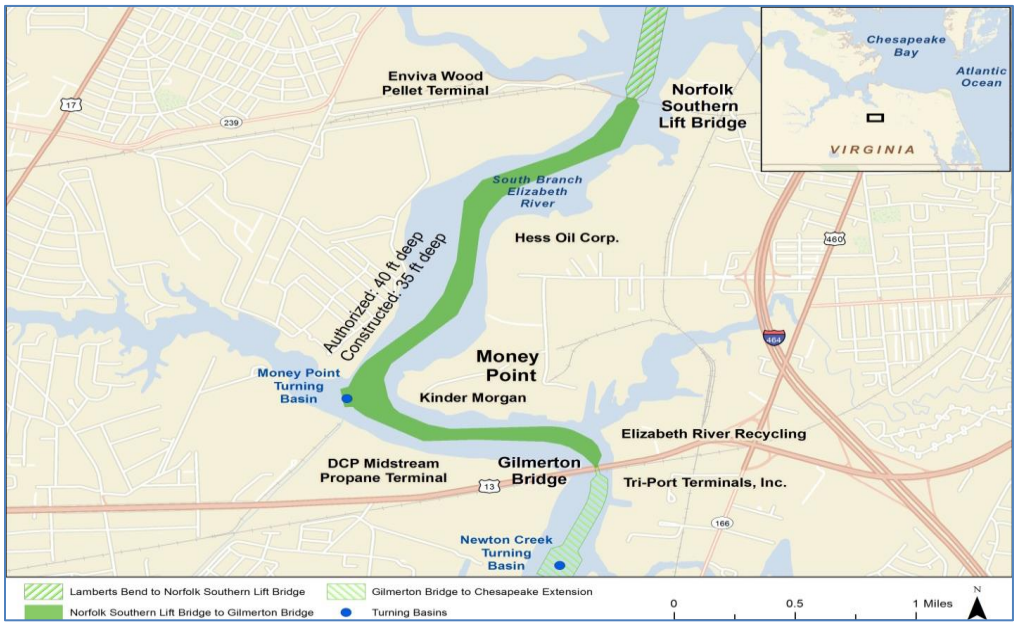

Figure 3. Segment 2. Elizabeth River and Southern Branch Navigation Improvements Project from the Norfolk Southern Lift Bridge to the Gilmerton Bridge.

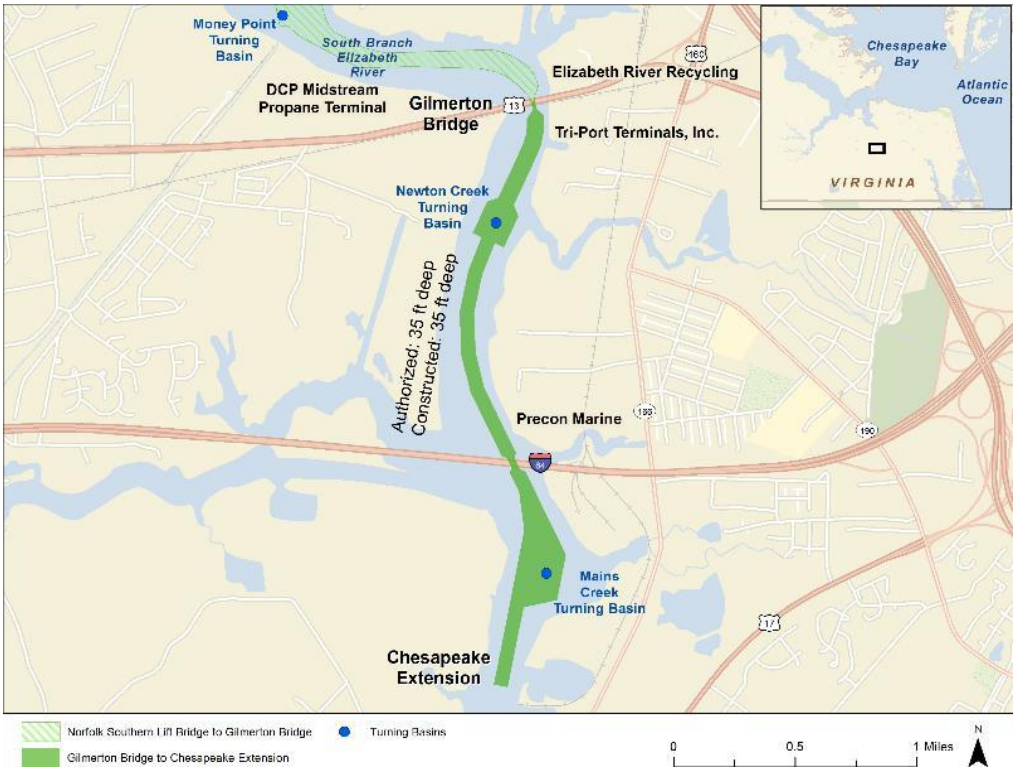

Figure 4. Segment 3. Elizabeth River and Southern Branch Navigation Improvements Project from the Gilmerton Bridge to the Chesapeake Extension.

3.0 DREDGE DISPOSAL LOCATIONS

Craney Island Dredged Material Management Area (CIDMMA)

The CIDMMA (Figure 1) is located in the City of Portsmouth in the eastern portion of the Atlantic Coastal Plain and adjacent to the confluence of the James River, Elizabeth River, and Nansemond River, and is in close proximity to the Chesapeake Bay and the Atlantic Ocean. The CIDMMA is a 2,500-acre confined disposal facility that was constructed by the USACE in the Hampton Roads area of Virginia. The CIDMMA was authorized by the River and Harbor Act of 1946. The federally owned facility is operated by USACE and is used by private interests, local municipalities, federal and Commonwealth of Virginia government agencies for the disposal of dredged material from Norfolk Harbor and its adjacent waterways.

Dredged material is received in two different ways at the CIDMMA. It is either pumped directly into one of three upland containment cells or it is deposited in the rehandling basin and then pumped into the facility. The Craney Island Rehandling Basin is a large deeper area off the southeast shoreline of the island that can be filled with material and then dredged once filled. Since it began operation, the CIDMMA has received, on average, 3.5 million cubic yards of dredged material per year. However, there have been several years when it has received more than 10 million cubic yards. At present, the USACE estimates that the facility has a realistic timeline lasting until approximately 2030. However, this may change as newer technologies and/or new management techniques are employed at the facility.

Craney Island Eastward Expansion

The CIEE is a potential, future 580-acre dredge material expansion area, for which an Environmental Impact Statement (EIS) was completed in 2006. It is proposed to be a rectangular-shaped containment area located immediately east of, and connecting to, CIDMMA. Once construction is completed, it will also accept suitable dredge material from the Norfolk Harbor/Elizabeth River, and is in intended to extend the life of CIDMMA (USACE 2006). Currently construction is underway for portions of the expansion.

Offsite Upland Disposal Facilities

Sediments within portions of the Elizabeth River have the potential to contain elevated levels of heavy metals, polyaromatic hydrocarbons (PAH's) and phthalates, the level of which could preclude disposal either offshore or at the CIDMMA. These sediments will be required to be disposed at an offsite upland disposal facility.

3.1 DREDGING AND DREDGED MATERIAL PLACEMENT PRACTICES OF THE PREFERRED ALTERNATIVE

The Elizabeth River and Southern Branch Navigation Improvements Feasibility Study is currently underway and the final array of alternatives that are being evaluated in detail are the following: a No Action/Future Without Project Alternative, Alternative 1 (the National Economic Development Plan), and Alternative 2 (the Locally Preferred Plan which is the Preferred Alternative). Based on the results of the economic analysis, no additional deepening beyond existing project maintenance will occur in Segment 3 for either of the action alternatives. Therefore, all of the alternatives will include just the existing maintenance of channel depths in Segment 3 (Figure 4). The only differences between the action alternatives are the deepening depths in Segment 1a. For the No Action/Future Without Project Alternative, there would be no deepening, and current channel depths would be maintained. Alternative 1 includes deepening of Segment 1a of the Elizabeth River to a required depth of 44 feet up to Perdue Farms and Segment 1b would be dredged to a required depth of 42 feet (Figure 2). Segment 2 (Figure 3) would be dredged to a required depth of 38 feet. For Alternative 2, the only difference from Alternative 1 is that Segment 1a up to Perdue Farms would be dredged to a required depth of 45 feet instead of 44 feet. For Alternative 2, Segment 1b would be dredged to a required depth of 42 feet, and Segment 2 would be dredged to a required depth of 39 feet.

For the environmental impact analysis we evaluated dredging depths impacts (and associated dredging volume and durations) that are deeper than the required (or target) dredging depth. This is because dredging beyond the required depth sometimes may be allowed for advanced maintenance and allowable paid and nonpaid overdepth and also because dredging to an exact depth out in the field is not practical. Therefore, the dredging depths, volumes, and durations vary between the economic analysis and the environmental impact analysis in our study. For the environmental impact analysis, we assumed that for construction of Alternative 1 or Alternative 2, the maximum, potential dredging depths would include the required depth in addition to one foot of Advanced Maintenance in addition to two feet of Paid Allowable Overdepth in addition to two feet of Nonpaid Allowable Overdepth and an additional foot of dredging in areas where contaminated dredged material is anticipated (in Segment 1 and Segment 2).

The Preferred Alternative, Alternative 2, is the alternative with the deepest maximum, potential dredging depths and consists of the following:

- Deepening Segment 1a to a required depth of 45 feet, with an additional six feet of maximum, potential advanced maintenance, overdepth, and contamination removal which equates to a maximum, potential 51 feet channel depth.
- Deepening of Segment 1b to a required depth of 42 feet, with an additional six feet of maximum, potential advanced maintenance, overdepth, and contamination removal which equates to a maximum, potential 48 feet channel depth.
- Deepening Segment 2 to a required depth of 39 feet, with an additional six feet of maximum, potential advanced maintenance, overdepth, and contamination removal which equates to a maximum, potential 45 feet channel depth.
- Segment 3 will be maintained to its current required depth of 35 feet, with an additional five feet of maximum, potential advanced maintenance and overdepth which equates to a maximum, potential 40 feet channel depth.

For the purpose of this Biological Assessment, we refer to required depths throughout the text but in terms of the impact analysis (effect determination), the estimated maximum, potential construction dredging depth of Alternative 2, the Preferred Alternative, will be evaluated (Table 1). Please see the table on the following page for the conversion of how to interpret dredging required depths versus maximum, potential dredging depths that may occur.

The number of vessel calls is anticipated to increase in the future as compared to existing conditions either with or without implementation of the proposed deepening project. However, in future conditions with implementation of the proposed deepening project, we would anticipate that the deepened channel system would allow for the existing larger vessels to transport commodities more efficiently and would result in fewer vessel calls as compared to the future without project condition. We would not anticipate a change in container vessel speeds transiting the harbor in the existing as compared to future conditions with and without project. The service speed for vessels around 14,000 TEUs is similar to the smaller vessel size of 8,000 Twenty-Foot Equivalent Units (TEUs). Vessel speeds for the container vessels would be approximately 18-24 knots in the unrestricted speed portions of the Action Area. There is an existing speed restriction of six knots in a portion of Segment 1 in the Action Area that extends from the junction of the Southern and Eastern Branches of the Elizabeth River and the Norfolk and Portsmouth Belt Line Railroad Bridge between Chesapeake and Portsmouth, Virginia. The remaining portions of the Action Area are not under a vessel speed restriction.

Dredges used for construction and maintenance of the Preferred Alternative would include hydraulic cutterhead dredges and mechanical dredges. Dredged material that is deemed unsuitable for CIDMMA will be dewatered in accordance with federal and state water quality requirements and taken to existing authorized upland landfills. Potential upland disposal sites for contaminated material may include, but are not limited to the following: Charles City County Landfill, CFS, Tri-City Regional Landfill & Recycling Center, John C. Holland Enterprises Landfill, Southeastern Public Service Authority (SPSA) Regional Landfill, Portsmouth City Craney Island Landfill, Bethel Landfill, King and Queen Sanitary Landfill. Additionally, the following soil processing services may be used which include, but are not limited to, the following: Port Tobacco/Weanack Land, LLC, and Clearfield MMG, Inc. Soil Recycling.

Dredging within the Elizabeth River and Southern Branch Navigation Improvements Project Area is anticipated to generate material with contamination within portions of Segment 1 and within Segment 2 that exceeds the acceptance criteria of CIDMMA. Contaminated dredged material

will need to be disposed of at an approved upland site(s). An engineered cap may be required to be installed after contaminant removal to isolate the location from the environment and future Operations and Maintenance activities.

Table 1. Estimated maximum, potential construction dredging volumes and durations and estimated maintenance dredging volumes and duration of the Elizabeth River and Southern Branch Navigation Improvements Project for the No Action/Future Without Project Alternative and Alternative 2, the Preferred Alternative.

				Estimated Construction Maximum				Estimated Maintenance - 50 Years		Summary - Construction Maximum and Maintainance	
Alternative	**Required Depth - feet (ft)**	**Current Volume above Existing Maintained Depth (cubic yards)**	**Estimated Maximum Depth (ft) = Required Depth + 1 ft Advanced Maintenance + 2 ft Paid Allowable Depth + 2 ft Non-Pay Allowable Overdepth + 1 ft Contamination Removal (select segments only)**	Estimated Maximum Volume (cubic yards)	Estimated Maximum Dredging Duration (Months)	Estimated Maximum Total Bottom Disturbance (square feet)	Estimated Maximum Change/Delta (increase) in Bottom Disturbance - (square feet)	**Estimated 50 Year Maintenance Volume (cubic yards)**	**Estimated 50 Year Maintenance Dredging Duration (months)**	**Estimated Maximum Volume - Volume Above Existing + Allowable Pay + Non-Pay + Maintenance Volume (cubic yards)**	**Estimated Maximum Construction + 50 Year Maintenance Dredging Duration (months)**
No Action Alternative/Future Without Project (NAA/FWOP)- Segment 1 Elizabeth River Reach	40	55,804	46	480,234	0.70	14,345,062	-	1,579,750	3.44	2,115,788.73	4.15
NAA/FWOP - Segment 1 Lower Reach	40	3,818	46	64,783	0.09	5,209,099	-	71,300	0.21	139,901.58	0.31
NAA/FWOP - Segment 1 Middle Reach	40	10,050	46	197,351	2.18	2,064,875	-	38,250	0.29	245,650.50	2.47
NAA/FWOP - Segment 2	35	1,938	40	359,206	4.48	5,020,273	-	884,800	6.27	1,245,944.38	10.75
NAA/FWOP - Segment 3	35	495,977	40	1,222,383	15.25	4,269,028	-	83,350	0.59	1,801,710.10	15.84
Total										**5,548,995.29**	**33.52**
Alternative 2 - Segment 1A	45	63,969	up to 50, 51 in MR	2,499,984	3.65	20,737,337	976,689	1,826,389	3.98	4,390,341.61	7.63
Alternative 2- Segment 1B	42	5,704	up to 48	71,877	0.79	2,039,347	180,960	5,144	0.04	82,724.58	0.83
Alternative 2 - Segment 2	39	1,938	up to 45	1,590,006	19.84	5,729,763	709,490	982,128	6.96	2,574,072.50	26.80
Alternative 2 - Segment 3	35	495,977	40	1,222,383	15.25	4,269,028	-	83,350	0.59	1,801,710.10	15.84
Total										**8,848,848.79**	**51.11**

3.2 PROJECT SCHEDULE AND DREDGING DURATIONS

Construction is anticipated to begin in approximately 2023 but is contingent on funding availability. Estimated dredging durations over a 50 year project lifecycle are provided in Table 1. Construction may occur at any time of the year. Construction may occur at any time of the day or night, however, continuous operations are not anticipated as there will be time needed for equipment maintenance and personnel shifts.

3.3 RECENT CONSULTATION HISTORY

The USACE formally consulted with the National Marine Fisheries Service (NMFS) in 2012, for multiple navigational channel and beneficial use project sites within the Chesapeake Bay and Atlantic Ocean watershed, in order to determine the effects to federally listed threatened or endangered species. The consultation and NMFS's resulting "Batched" Biological Opinion (NMFS 2012) included the Action Area for this project and additional projects: Southern Branch of the Elizabeth River channel, including maintenance as well as disposal of dredged material at CIDMMA and CIEE. The USACE projects covered by NMFS' findings were: maintenance dredging of the entire Norfolk Harbor and Elizabeth River channel system, the Cape Henry Channel, York River Entrance Channel, York River Spit Channel, Thimble Shoals Channel, Atlantic Ocean Channel; and dredged material placement at DNODS, NODS, Virginia Beach Hurricane Protection Project, Sandbridge Beach Nourishment Project, CIDMMA, Craney Island Eastern Expansion, Wolf Trap Alternative Placement Site, and others. Therefore, its findings are inclusive of effects beyond the Action Area of this project. The NMFS issued its Biological Opinion on October 16, 2012, and it stated that its findings are valid for a period of 50 years (NMFS 2012). A more detailed account of previous consultation history between the USACE and the NMFS is described in the NMFS (2012) batched Biological Opinion.

During the consultation period in 2012, NMFS requested the USACE consider a "batched" Biological Opinion for efficiency due to the volume of consultations resulting from the Atlantic sturgeon listing. The USACE agreed to be issued its own incidental take statement, and each included project would be able to re-initiate Section 7 consultation independently of the other projects when scope changes or project specific conditions warranted reinitiation of consultation. Section 2.0 of the 2012 NMFS Biological Opinion states that reinitiation of Section 7 consultation for an individual project covered in the batched opinion is allowable for affects that are limited to one action (e.g. a change in dredge type, dredge volume or disposal area).

For this Biological Assessment and consultation with NMFS we are only reinitiating consultation for the Elizabeth River and Southern Branch portion of the Norfolk Harbor and Channels listed described in the NMFS (2012) batched Biological Opinion and this will not affect the other consultations described in the NMFS (2012) Biological Opinion.

3.4 ACTION AREA

Per 50 CFR 402.02, the Action Area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The Action Area consists of the Elizabeth River Southern Branch channels, from Lamberts Bend to the Chesapeake Extension; areas transited by dredging vessels/equipment, areas of navigation channel and dredged material placement/disposal sites. The Action Area includes the area of anticipated circulation patterns shifts and potential water quality impacts. The geographic extent of water quality impacts is dependent upon factors such as the type of dredging

equipment, the dredging depth, and environmental conditions such as wind and currents (USACE 1983). The Action Area includes the range of noise impacts as they pertain to individual listed species.

3.5 THREATENED AND ENDANGERED SPECIES

Animals and plants listed as endangered or threatened are protected under the Endangered Species Act of 1973, as amended (ESA). According to the ESA, an "endangered species" is defined as any plant or animal species in danger of extinction throughout all or a substantial portion of its range. A "threatened species" is any species likely to become an endangered species in the foreseeable future throughout all or a substantial part of its range. "Proposed Species" are animal or plant species proposed in the Federal Register to be listed under Section 4 of the ESA. "Candidate species" are species for which the USFWS and NMFS have sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA. "Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect." "Critical habitat" is designated per 50 CFR parts 17 or 226 and defines those habitats that are essential for the conservation of a federally listed threatened or endangered species and that may require special management and protection.

This section provides a summary of the federally listed species that are known or have the potential to occur in the Action Area. The following references were consulted for compilation of the federally listed species provided in Table 2 that have the potential to occur in the Action Area.

- Virginia Aquarium Stranding Response Program's Vessel Interaction datasets for sea turtles and marine mammals (Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program 2017a-2017b);
- Virginia Sea Turtle and Marine Mammal Stranding Network Reports (Swingle et al. 2017-2010; Barco and Swingle 2014);
- Information, Planning and Consultation System (IPaC) search conducted within the Action Area (U.S. Fish and Wildlife Service (USFWS) 2016a);
- Virginia Fish and Wildlife Information Service (VaFWIS) database search within a three mile radius of the Action Area (Virginia Department of Game and Inland Fisheries (VDGIF) 2016b);
- Virginia Natural Heritage Database Search (Department of Conservation and Recreation (DCR) 2016);
- National Oceanographic and Atmospheric Administration, National Marine Fisheries Service (NMFS) (2012) batched Biological Opinion that includes the Norfolk Harbor and Channels; and the
- Large Whale Strike Database (Jensen and Silber 2003).

Relevant consultation correspondence is provided in Appendix A. A copy of the reports generated from the federal and state databases is provided in Appendix B. The batched Biological Opinion submitted from the NMFS to the USACE in 2012 that includes the Norfolk Harbor Channels Project was also used as a reference guide to determine those federally listed species known or with the potential to occur in the Action Area and to provide a frame of reference for potential impacts to listed species under the jurisdictional authority of the NMFS. Federally listed species known or with the potential to occur in the Action Area are described in Table 2. The Official Species List provided from NMFS for this project is provided in Appendix A and Table 2 includes all of the species provided by NMFS (2012) but also includes additional

species based on our analysis. There are no candidate species known or with the potential to occur in the Action Area. While some of the listed species in Table 2 have critical habitat, there is no designated critical habitat located in the Action Area of the Norfolk Harbor and Channels Deepening Project. While critical habitat for the Atlantic Sturgeon was designated in 2017, there is no designated Atlantic Sturgeon Critical Habitat located in the Action Area.

Table 2. Federally listed species known or with the potential to occur in the Action Area (Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program 2017a-2017b; Swingle et al. 2017-2010; USFWS 2016a; VDGIF 2016b; DCR 2016; Jensen and Silber 2003).

Taxonomic Category/Common Name	Scientific Name	Status	Critical Habitat
Birds			
Piping plover	*Charadrius melodus*	T	Y*
Red knot	*Calidris canatus rufa*	T	N
Fish			
Atlantic sturgeon (Chesapeake Bay DPS)	*Acipenser oxyrinchus*	E	Y*
Shortnose sturgeon	*Acipenser brevirostrum*	E	N
Mammals			
Blue whale	*Balaenoptera musculus*	E	N
Fin whale	*Balaenoptera physalus*	E	N
North Atlantic right whale	*Eubalaena glacialis*	E	Y*
Northern long-eared bat	*Myotis septentrionalis*	T	N
Sei whale	*Balaenoptera borealis*	E	N
Sperm whale	*Physeter macrocephalus*	E	N
West Indian manatee	*Trichechus manatus*	T	Y*
Sea Turtles			
Green sea turtle (North Atlantic DPS)	*Chelonia mydas*	T	Y*
Hawksbill sea turtle	*Eretmochelys imbricata*	E	Y*
Kemp's Ridley sea turtle	*Lepidochelys kempii*	E	N
Leatherback sea turtle	*Dermochelys coriacea*	E	Y*
Loggerhead sea turtle (Northwest Atlantic DPS)	*Caretta caretta*	T	Y*

DPS = Distinct Population Segment; T = Threatened; E = Endangered; Y = Yes; N = No
^Species status is reported as it pertains to the DPS/Action Area; *Critical Habitat not located in Action Area

Birds

Piping Plover. The piping plover was listed as threatened in January 1986. The piping plover is a small shorebird that nests in the three separate geographic populations in the U.S.: the Great Plains states, the shores of the Great Lakes, and the shores of the Atlantic coast. Birds from all populations winter on the southern Atlantic and Gulf coasts in the U.S. The Atlantic coast population breeds on coastal beaches from Newfoundland to North Carolina (and occasionally South Carolina) and winters along the Atlantic coast from North Carolina south, along the Gulf Coast, and in the Caribbean (USFWS 1996).

The piping plover is approximately seven inches in length, with a wingspan of about 15 inches. It has a pale brown back and crown, white underparts and rump, and a black upper tail with a white edge. It has an orange bill with black tip, a single breast black breastband, and a black bar across its forehead, and yellow to orange legs. The piping plover forages for invertebrates along the waterline of beaches, and nests in sandy/gravelly depressions away from the water, often within tern colonies. Nest sites are shallow scraped depressions in substrates ranging from fine grained sand to mixtures of sand and pebbles, shells or cobble, usually where there is little or no vegetation (USFWS 1996). Breeding and wintering plovers forage on exposed wet sand in wash zones. They feed by probing for invertebrates that are found at or below the surface.

Piping plovers can be found in Virginia from spring through fall. In Virginia, breeding and nesting is currently restricted to the Eastern Shore barrier islands (VDGIF 2016a). Plovers nest on ocean-facing beaches with little vegetation. Extensive beaches with wash-over habitat that have access to mudflats, sandflats, and tidal lagoons provide optimal nesting habitat for this species (VDGIF 2016a). According to VDGIF and USACE, they have been documented within the Action Area, in the northern portion of, and within 0.75 mile of, the southern portion of CIDMMA. They winter in the Gulf of Mexico or the Caribbean (Navy 2009). This species previously nested at CIDMMA, however, nesting has not occurred since 1997. Since 1998, migrating piping plovers have been observed foraging at CIDMMA by USACE staff in the early spring and again in the late summer during migration. Therefore, this species may occur and forage within the Action Area but it does not currently nest in the Action Area.

Since its listing in 1986, the overall species population has increased 234%, from 790 pairs to an estimated 1,849 pairs; and the U.S. population has almost tripled from approximately 550 pairs to an estimated 1,596 pairs. However, its population growth pattern remains unstable. For example, in the Southern recovery unit, there had been a 68% decline between 1995 and 2001, prior to an overall increase between 1989 and 2008 of 66%, with almost three-quarters of this increase occurring in two years: 2003-2005 (USFWS 2009). However, 2011 a census undertaken by the U.S. Geological Survey found 3,973 individuals during the winter census, and 5,723 individuals during the breeding census (Elliott-Smith 2015). The main threats to the species are habitat loss and degradation, predation (particularly by dogs and cats), human disturbance, and more recently, wind turbines and climate change. Oil spills also are a potential threat to this species (USFWS 2009).

Critical habitat has been designated for this species in Illinois, Indiana, Michigan, Minnesota, New York, Ohio, and Pennsylvania, but there is no designated critical habitat in Virginia (USFWS 2009).

Red Knot. The red knot was listed as threatened in 2014. Red knots are characterized by their large, bulky sandpiper body form and a short, straight bill that tapers at the tip. Their head and breast are reddish in color during the breeding season but gray in color during the rest of the year. Red knots are known for their extensive migrations that can occur more than 9,300 miles from the Tierra del Fuego to the Canadian Arctic (USFWS 2016b). The decline of the red knot population in the 2000s is thought to be attributed to degrading foraging habitats. Delaware Bay is a key stopover for migrating red knots before they reach their breeding grounds in the Canadian Arctic. The increase in taking of horseshoe crabs for bait in commercial fisheries that occurred in the 1990s may be a major factor in the decline in red knots (USFWS 2005), but horseshoe crab harvests in Delaware Bay are now under management to help recover the red knot population. There is no nesting habitat within the Action Area, however, foraging may occur in the Action Area. Red knots are thought to be vulnerable to the increasing threats of

climate change that may impact the arctic tundra ecosystem in their breeding areas, coastal foraging habitats and other foraging habitats, and storm and weather changes (USFWS 2016b). Within the past few years, the population is thought to have stabilized but still remains at low population levels (USFWS 2016b).

Fish

Atlantic Sturgeon. Atlantic Sturgeon that are spawned in U.S. rivers, or are captive progeny of Atlantic sturgeon that were spawned in U.S. rivers, are listed under the ESA as five District Population Segments (DPSs). They are: the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs. The range of the five overlaps and extends from Canada through Cape Canaveral, Florida. They can be found in major rivers, estuaries, bays and coastal waters along the eastern seaboard of the United States. The Chesapeake Bay is known to be used by all five DPSs. The Gulf of Maine DPS was federally listed as threatened and the rest were listed as endangered on February 6, 2012 (NOAA 2016a).

Atlantic sturgeon are an anadromous bony fish that are distinguishable from other fish by five rows of bony scutes along the length of their body, a protrusible mouth, and heterocercal tail. They are slow growing and late maturing, and have been recorded to reach up to 16 feet in length and 60 years of age. They are bottom feeders that suck food into a ventrally-located protruding mouth. The diet of adult and subadult Atlantic sturgeon includes mollusks, gastropods, amphipods, annelids, decapods, isopods, and fish (NMFS 2012).

According to the NMFS Biological Opinion, spawning for the Chesapeake Bay DPS is only known to occur in the James River. It may be occurring in other tributaries to the Chesapeake Bay, but this has not been confirmed. Spawning migrations generally occur during April-May in Mid-Atlantic systems; water temperature plays a primary role in triggering the timing. Male sturgeon begin upstream spawning migrations when waters reach approximately 6°C (43°F), and remain on spawning grounds through the spawning season. Females begin spawning migrations when temperatures are closer to 12°C to 13°C (54-55°F), make rapid spawning migrations upstream, and quickly depart following spawning. Spawning is believed to occur in flowing water between the salt front of the estuaries and the fall line of large rivers, when and where optimal flows are 46-76 centimeters per second and depths are three to 27 meters. Sturgeon eggs are deposited on hard bottom substrate such as cobble, coarse sand, and bedrock. At temperatures of 20°C and 18°C, hatching occurs approximately 94 and 140 hours, respectively, after egg deposition. Larval Atlantic sturgeon are assumed to inhabit the same riverine or estuarine areas where they were spawned. Studies show that eggs and larvae through age two sturgeon occur in low salinity waters; as such, no eggs, larvae, or young of the year are likely to occur in the Action Area. However, older fish are more salt tolerant and occur in higher salinity waters as well as low salinity waters. Atlantic sturgeon may remain in the natal estuary for months to years before migrating to open ocean as subadults (NMFS 2012). Adults pass through the northern limits of the Action Area as they move to the James River to spawn in the spring, and then again as they return to the ocean. The NMFS noted that subadults could be present in or near the multi-project Action Area year-round, but indicated that they are less likely to be present in the winter months when individuals would be at overwintering areas, which are not known to occur in the Action Area (NMFS 2012).

The USACE, Norfolk District has documented the presence of the Atlantic Sturgeon within the lower Chesapeake Bay. During sea turtle relocation trawling conducted in fall of 2003 in conjunction with the 50-foot deepening of the inbound element of the Thimble Shoal Channel, 14 Atlantic sturgeon were captured by the trawler and released live in and around the channel;

no incidental takes of Atlantic sturgeon by hopper dredge were observed during this period. Additionally, the incidental take of two Atlantic sturgeon were documented in York Spit Channel during April of 2011 while conducting maintenance dredging operations with a hopper dredge. The York Spit Channel is located in the Chesapeake Bay, approximately 14 miles by water from the Action Area for this project. The noted incidental takes and relocations of the Atlantic sturgeon in the lower Chesapeake Bay are associated with hopper dredging operations that are known to pose a risk of entrainment. However, no hopper dredging occurs or will occur in the Action Area; only hydraulic cutterhead dredging with pipeline and mechanical dredging occurs in the Action Area. No takes have ever been recorded by the USACE Norfolk District in the Elizabeth River. No Atlantic Sturgeon were detected in dredged material pumped into the CIDMMA from the Action Area for the past four years.

Historically, this species had range-wide declines due to overfishing and the caviar market. Currently, the most significant threat for all five DPSs is by-catch in fisheries. Other significant threats are vessel strikes, poor water quality, water availability, dams, and dredging. Records show that 11 Atlantic sturgeon were struck by vessels between 2005 and 2007 in the James River, which is northwest of the Action Area (NMFS 2012).

In 2017 NMFS designated Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay DPSs of Atlantic sturgeon in the Federal Register. These locations are in Maine, New York, New Jersey, Pennsylvania, Maryland, and Virginia. The locations in Virginia include the Potomac, Rappahannock, York, and James Rivers, out to their confluence with the Chesapeake Bay. The location of critical habitat in the James River is depicted in Figure 5. However, these areas are all located outside the Action Area of this project.

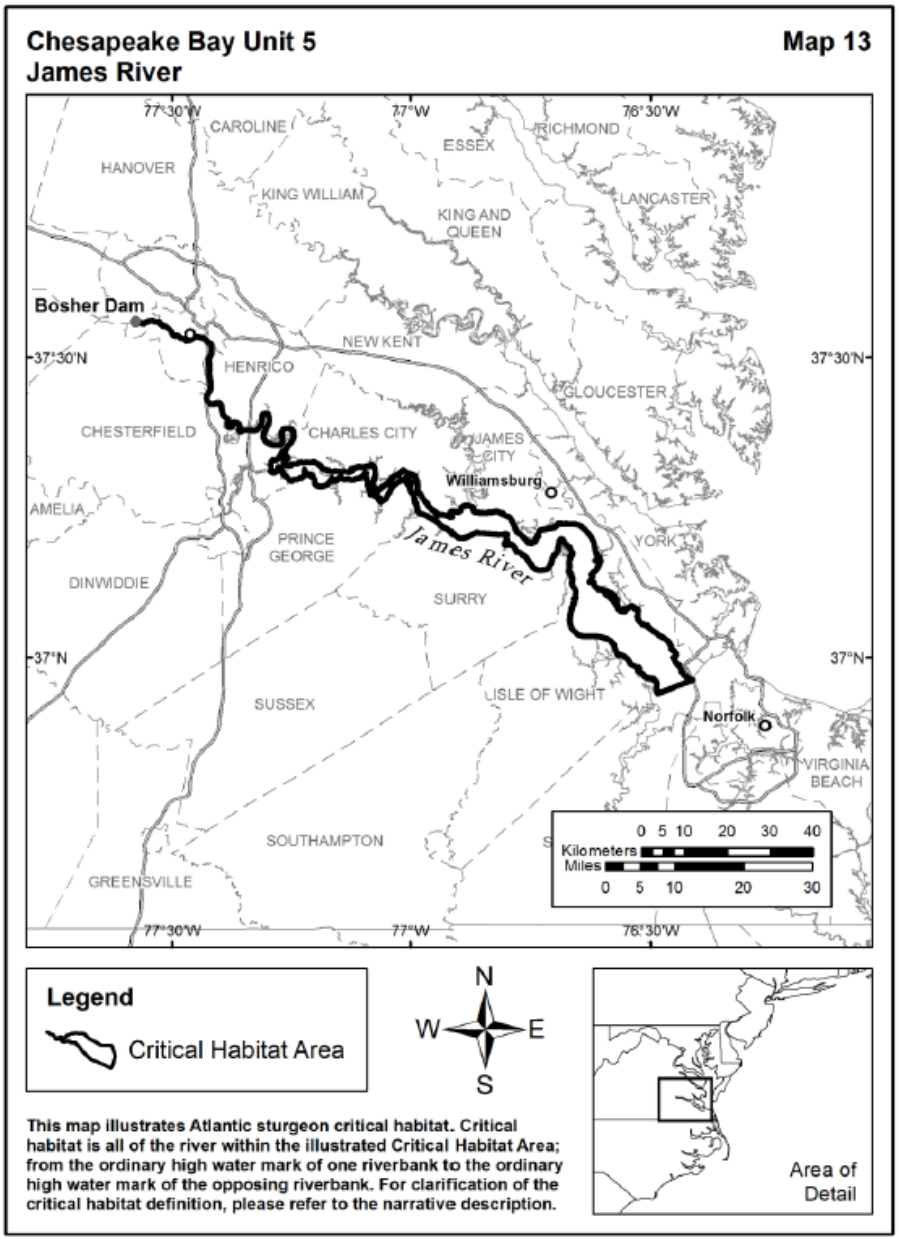

Figure 5. The heavy bold line outlines the Critical Habitat for Atlantic Sturgeon within the James River, Virginia in the Action Area.

Shortnose Sturgeon. The shortnose sturgeon was federally listed as endangered in March 1967, under the Endangered Species Preservation Act of 1966, a predecessor to the Endangered Species Act of 1973. The shortnose sturgeon is the smallest of the three sturgeon species that occur in eastern North America. Currently, they range from as far south as the St. Johns River, Florida, to as far north as the St. John River in New Brunswick, Canada. Shortnose sturgeon are a long-lived and typically large anadromous fish that are found in a range of habitats from fast-moving freshwater riverine environments, downstream to the offshore marine environment of the continental shelf. They grow up to approximately 4.7 feet and weigh up to 50.7 pounds. Their body surface contains five rows of bony plates, or "scutes." Female sturgeon can live up to 67 years, but males seldom exceed 30 years of age. (NOAA 2016i).

Adult shortnose sturgeon feed primarily on small crustaceans and mollusks in estuarine waters. Juvenile sturgeon forage on insect larvae. They are anadromous and migrate to freshwater to spawn during late winter and early summer. Juveniles migrate to and from freshwater for several years, eventually remaining in estuarine waters and joining adult migration patterns. Shortnose sturgeon were once abundant in Chesapeake Bay; however, the population has declined significantly since the first published account of their presence in 1876 (NMFS 1998).

The shortnose sturgeon is very rare locally, with only several dozen records of capture from the Chesapeake Bay region in the past century, forty of which were the result of a reward program for reporting capture between 1996 and 2000 (Welsh et al. 2002). Most of these records were from Maryland waters, and none were located within the Action Area.

As described by NMFS (2012), the shortnose sturgeon is found in 19 rivers along the U.S. Atlantic coast. It occurred historically in the Chesapeake Bay. However, NMFS indicated that despite numerous sturgeon studies in Virginia waters, only one shortnose sturgeon has been documented in all of Virginia since 1996, and that was in the Chesapeake Bay. Prior to 1996, according to NMFS, there were only 15 published historic records of them in the Bay; and they were mostly based on personal observations in the 1970s and 1980s. Therefore, NMFS had concluded in its 2012 BO, which covered numerous USACE dredging projects including the ERSB project that this species is very unlikely to be found in the Bay or within that entire Action Area (NMFS 2012). Therefore, the shortnose sturgeon would not likely occur in the Action Area for the ERSB project.

Mammals

Blue Whale. The blue whale was listed as endangered in 1970. Blue whales are characterized by a long and slender body and a flat rostrum (NOAA 2016b). Blue whales are the largest of the baleen whales, and can reach a length of up to 110 feet and weight up to 330,000 pounds (NOAA 2016). Blue whales are listed as endangered throughout their range and are found in coastal areas from sub-polar to sub-tropical latitudes. Blue whales migration is linked to their food source. The primary diet of the blue whale is krill (although they also feed upon fish and copepods); they migrate towards the poles in the spring to forage on krill (NOAA 2016b). Their migratory routes are largely unknown. Blue whales typically are found offshore but are also found in coastal waters. Blue whale populations are distinguished by ocean basin in the North Atlantic, North Pacific, and Southern Hemisphere. There are two distinct populations of blue whales in the North Atlantic (NOAAb 2016b).

Blue whales were largely depleted by worldwide commercial whaling operations (NOAA 2016b). In 1966, the International Whaling Commission (IWC) banned commercial whaling of this species and this species is no longer hunted. The current abundance of blue whales in the North Atlantic, Southern Hemisphere, and North Pacific is only approximately 5,000 whales and represents a 97% decline prior to their depletion from whaling operations (IWC 2007 in NOAA 2016b). The current threats to blue whale populations are potential vessel strikes and entanglement in fishery gear. Jensen and Silber (2003) reported eight ship strikes worldwide to the blue whale in a database compiled that consisted of all reported ship strikes through 2002. Reports of incidental take from entanglement with fishery gear are rare but that is likely underestimated because blue whales may break through or away from fishery gear and later die (NOAA 2016b). Other threats could include noise impacts, habitat degradation, pollution, vessel disturbance, and climate change impacts. However, it is difficult to describe or quantify these threats with the limited available data and information available (NOAA 2016b).

Based on our review of the marine stranding data compiled by the Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program since 1988 (Barco and Swingle 2014), there were no reported blue whale strandings within or outside of the Action Area in coastal waters of Virginia. The NMFS 2012 BO had concluded that none of the USACE's dredging projects that it covered were likely to provide habitat for the blue whale; therefore, the species would not be expected to be found within the Action Area. Because of the predominant offshore habitat preference for this species and the lack of documented occurrence of blue whale presence or strike or stranding incidence in the Action Area, any presence of this species in the Action Area would be extremely rare and not anticipated.

Fin Whale. The fin whale was listed in endangered in 1970. Fin whales are characterized by their sleek, streamlined body with black or dark brownish-gray coloration on the top and sides with a white underbelly. Fin whales are second in size only to the blue whale and can reach a maximum length of 85 feet and can weigh up to 160,000 pounds (NOAA 2013). Females are typically longer than males and can be as much as 10% longer. Fin whales occasionally hybridize with blue whales (NOAA 2013). Fin whales typically occur in social groupings that consist of 2-7 fin whales (NOAA 2013). In the North Atlantic, fin whales sometimes congregate to feed with other whales and dolphins (Jefferson et al. 2008 in NOAA 2013). They forage on krill, small schooling fish, and squid except in the winter when they are fasting. The only reported predator of the fin whale is the killer whale.

Fin whales are distributed in a wide range of latitudes and longitudes typically in deep, offshore waters worldwide (NOAA 2013). There are two subspecies of fin whale (*B. physalus* that occurs in the North Atlantic and *B. physalus quoyi* that occurs in the Southern Atlantic Ocean) (NOAA 2013). The Western North Atlantic Stock is estimated at 1,678 whales (NOAA 2013).

Commercial whaling greatly depleted the fin whale but was ended in most locations by 1987. Fin whales are still hunted in Greenland subject to the catch limits of the IWC. Poaching and also resumed commercial whaling are potential threats to this species (NOAA 2013). Other threats include ship strikes, entanglement in fishing gear, low prey abundance from overfishing, habitat degradation, and noise disturbance (NOAA 2013). Based on a database that consisted of all reported whale ship strikes from 1975 through 2002, fin whales were struck more than any other whale species with 75 out of 292 strikes (Jensen and Silber 2003).

Based on a query of the Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program data (2017b) that is submitted into the National Marine Mammal Stranding Database for reported marine mammal stranding and vessel interactions in Virginia from 2003-2017, there was one reported stranding in the Action Area attributed to a vessel interaction with a fin whale. However, the location of the fin whale strike is unknown and it is uncertain if the strike occurred in the Action Area. Because of the predominant offshore habitat preference for this species, any presence of this species in the Action Area would be rare.

North Atlantic Right Whale. The North Atlantic right whale (right whale) was listed as endangered in 1970. Right whales are characterized by a stocky body, black coloration, no dorsal fin, and patches of rough skin on the head. Right whales are large baleen whales that reach a length of approximately 50 feet and weigh up to 79 tons (NOAA 2016e). Right whales are distributed in the Atlantic Ocean typically between 20° and 60° latitude (NOAA 2016e). Movements within and among North Atlantic states is extensive and is thought to be an important migratory corridor. Northern right whales are known to congregate seasonally in the coastal waters of the southeastern United States and have been sighted in the Action

Area/adjacent area within the 2007 – 2011 time period (NOAA 2016f). Most of the North Atlantic population winter and have calving areas in coastal waters off of the southeastern U.S. while the feeding and nursery grounds are located in New England water and north to the Bay of Fundy and Scotian Shelf Right whales typically forage in the spring to fall on zooplankton but sometimes forage in the winter. Known high use areas that are considered valuable habitat for the right whales includes coastal Florida and Georgia, the Great South Channel, Massachusetts Bay and Cape Cod Bay, the Bay of Fundy, and the Scotian Shelf (NOAA 2016f).

The western North Atlantic population is thought to consist of approximately 450 whales and is thought to be slightly increasing; however North Atlantic right whales are critically endangered and the population trend could change quickly (NOAA 2016e). Critical habitat was designated in the North Atlantic in 1994 and in 2016.

Threats to the right whale are similar to those for other whales: ship collisions, entanglement in fishing gear, habitat degradation, exposure to contaminants, climate and ecosystem change, disturbance from whale-watching operations, noise, and natural predation from large sharks and killer whales. However, speed restrictions of 10 knots or less have been put into place from November 1 to April 30 via regulation 50 CFR 224.105.

Human-induced mortality from 2009 – 2013 averaged at a reported 4.3 per year for the western North Atlantic Stock and was the result of incidental fishery entanglement take (3.4/year) and ship strikes (0.9/year) (NOAA 2016f). Jensen and Silber (2003) reported 38 ship strikes worldwide to the Atlantic right whales in a databased compiled that consisted of all reported ship strikes through 2002.

No critical habitat occurs in the Action Area (NOAA 2016e). The NMFS 2012 BO had noted that the Chesapeake Bay is not a high use area for whales, that no whales are known to be resident in this area, and even transient whales are considered rare in the lower Bay and inland (NMFS 2012). Because of the predominant offshore habitat preference for this species and the lack of documented occurrence of right whale presence or strike or stranding incidence in the Action Area, any presence of this species in the Action Area would be extremely rare and not anticipated.

Northern Long-Eared Bat. The USFWS listed the northern long-eared bat threatened in 2015, with no designated critical habitat. The most severe threat attributed to the substantial population decline of the northern long-eared bat has been the widespread spread of the White-Nosed Syndrome that is caused by the fungal infection *Pd* (*Pseudogymnoascus destructans*).

The Action Area is located within the managed White-Nose Syndrome Buffer Zone as defined by the USFWS (2015b). Populations in Virginia are thought to have declined by 96% and are anticipated to decline with the continued spread of the White-Nose Syndrome (VDGIF 2014, unpublished data in USFWS 2015a). The northern long-eared bat is dark brown on its back with lighter coloration underneath with a wingspan of approximately nine to 10 inches and is approximately three to four inches in body length (USFWS 2015a). This bat is distinguished from other similar bat species in its genus by the length of its ears that extend past its nose when folded. During the winter, northern long-eared bats hibernate in caves and mines called hibernacula. During the summer, this species roosts beneath bark and in cavities of both live and dead trees (snags). They will also roost in human-made structures such as culverts, barns, and sheds. Females give birth to one young during the summer. There are no known

surveys of this species in the Action Area so it unknown if they forage in the Action Area. There are no trees in the Action Area and there are no reported roosting in the Action Area. No reported natural hibernacula are located in the Action Area. It is unknown if northern long-eared bats migrate through the Action Area.

Sei Whale. The sei whale was listed as Endangered in 1970. Sei whales are characterized by a dark bluish-gray body that is pale underneath with a dorsal fin that is located approximately two-thirds of the way down the back. They have a single ridge on their rostrum which distinguishes them from other whale species. Sei whales can reach up to 60 feet and weigh 100,000 pounds. The whale is listed as endangered throughout its range and has a worldwide cosmopolitan distribution throughout subtropical, temperature, and subpolar waters although they prefer temperate waters in mid-latitudes; they are found in the Atlantic, Indian, and Pacific Oceans. Sei whales in the U.S. are divided into the Hawaiian Stock, Eastern North Pacific Stock, Nova Scotia Stock, and Western North Atlantic Stock. The estimated worldwide population is approximately 80,000 whales with the Hawaiian Stock containing approximately 40 – 80 whales and the eastern north Pacific stock containing approximately 35 – 55 whales (NOAA 2016h). There are no other stock assessments available in the U.S. The full distribution and migratory patterns of this species are largely unknown. Populations are thought to migrate to the lower latitudes in the winter and the higher latitudes during the summer. They are typically found in oceanic areas far from coastlines.

Sei whales were largely depleted during the 19th and 20th century from commercial hunting and whaling with a loss of an estimated 300,000 whales (NOAA 2016h). Other contributing threats to the sei whale population include potential impacts from ship strikes and entanglement in fishing gear (NOAA 2016h). Jensen and Silber (2003) reported three ship strikes worldwide to the sei whales in a database compiled that consisted of all reported ship strikes through 2002. The sei whale population in the Southern Atlantic Ocean is still largely depleted while the whales are more abundant in the North Atlantic and North Pacific (NOAA 2016h).

The sei whale forages on plankton, small fish, and cephalopods. Sei whales are often spotted in small groups of approximately two to five whales. They are the fastest swimming cetaceans, reaching speeds of 34.5 miles per hour (NOAA 2016h).

The NMFS 2012 Biological Opinion had noted that the Chesapeake Bay is not a high use area for whales, that no whales are known to be resident in this area, and even transient whales are considered rare in the lower Bay and inland (NMFS 2012). Based on a review of reported marine mammal and vessel interactions in the National Marine Mammal Stranding Database with Virginia stranding data compiled by the Virginia Aquarium and Marine Science Center Stranding Response Center from 2003-2017 (NOAA 2017a), there is one sei whale stranding caused by a vessel interaction that was reported to occur in the Action Area. However, the location of the vessel interaction is unknown and it is unknown if the vessel interaction occurred in the Action Area. This sole sei whale swam into the Elizabeth River in 2014 and eventually died in the Elizabeth River; the death of the whale was attributed to blunt force trauma, however, the whale was also emaciated likely because it had difficulty feeding because plastic was found in its stomach chamber. However, this is the only known reported occurrence of a sei whale in the Action Area or adjacent areas and therefore, sei whales would be considered a rare occurrence in the Action Area. Because of the predominant offshore habitat preference for this species and the sole documented occurrence of this species in the Action Area, any presence of sei whales in the Action Area would be rare.

Sperm Whale. Sperm whales were listed as endangered in 1970. In some mid-latitudes, sperm whales may migrate poleward in the summer. Sperm whales are the largest species of the toothed whales and are characterized by a large head that comprises a third of its body length and dark gray coloration with some white patches on their underside. Males are considerably larger than females with males reaching an approximate maximum length of 52 feet and weight of 45 tons and females reaching a maximum length of approximately 36 feet and 15 tons (NOAA 2016j). Sperm whales have a worldwide distribution in deep waters typically between 60° north and 60° south latitudes. Sperm whale migrations are largely unknown. The estimated population of sperm whales is approximately 200,000 – 1,500,000 but remains largely unverified (NOAA 2016j). Whaling from 1800 – 1987 has largely decimated sperm whale populations with a loss of up to approximately 1,000,000 whales (NOAA 2016j). However, a hunting moratorium imposed by the IWC in 1988 lead to the near cessation of hunting. Current threats to the sperm whale population are from potential ship strikes, entanglement in fishing gear, noise disturbance, and coastal pollution (contaminants). Jensen and Silber (2003) reported 17 ship strikes worldwide to sperm whales in a database compiled that consisted of all reported ship strikes through 2002. Killer whales and large sharks are potential natural predators of sperm whales. Killer whales are known to kill sperm whales, although it is thought that many attacks do not result in sperm whale mortality. Sperm whales forage mainly in deep waters on large squid, sharks, skates, and fishes (NOAA 2016j). Squid comprises the greatest percentage of their diet.

The NMFS 2012 Batched BO had noted that the Chesapeake Bay is not a high use area for whales, that no whales are known to be resident in this area, and even transient whales are considered rare in the lower Bay and inland (NMFS 2012). Because of the predominant offshore habitat preference for this species and the lack of documented occurrence of sperm whale presence or strike or stranding incidence in the Action Area, any presence of this species in the Action Area would be extremely rare and not anticipated.

West Indian Manatee. The West Indian manatee is listed as a federally listed species throughout its range. It can be found along the coast of Florida and in the Caribbean. Adult manatees are about 10 feet long and weigh from 800 to 1,200 pounds. These docile animals feed on aquatic vegetation and move slowly through the water, often resting just below the water's surface with only its snout above water. They prefer large slow-moving rivers, river mouths, and shallow coastal areas. According to U.S. Fish and Wildlife Service, "The animals may travel great distances as they migrate between winter and summer grounds. During the winter, manatees congregate around warm springs and around power plants that discharge warm water. During summer months, they have occasionally been seen as far north as Virginia and Maryland." (USFWS 2008). There is no resident manatee population in the Action Area and the presence of a manatee in the Action Area would be considered a rare occurrence.

Sea Turtles

Five sea turtle species are found in the U.S. Atlantic Ocean: green, hawksbill, Kemp's Ridley, leatherback, and loggerhead sea turtles. Sea turtles often migrate long distances from nesting beaches to their foraging grounds. The Atlantic and Gulf waters serve as important foraging and developmental areas for sea turtles when water temperatures are warm enough. As water temperatures warm in the spring, sea turtles begin to migrate northward, typically arriving in Virginia waters as early as April/May and on the more northern foraging grounds in New England in June. This trend is reversed in the fall as water temperatures cool with most sea turtles leaving New England by fall (NOAA 2016g). Sea turtles may be in Virginia waters from April through mid-November with the greatest number of sea turtles present from June through

October (NMFS 2012). Based on the historical sea turtle nesting data collected by the Virginia Aquarium and Marine Science Center and the VDGIF, no sea turtle nesting occurs in the Action Area.

Green Sea Turtle. The green sea turtle was listed as endangered in Florida, and threatened elsewhere in the U.S., in July 1978. However, on April 6, 2016, NMFS superseded this with a Federal Register announcement of 11 worldwide DPSs for this species, the North Atlantic DPS being inclusive of this region. The range of this DPS extends from the boundary of South and Central America, north along the coast to include Panama, Costa Rica, Nicaragua, Honduras, Belize, Mexico, and the United States East Coast. The range extends due east across the Atlantic Ocean to include a portion of the west coast of Africa. It was re-listed as a threatened species (Federal Register, 81 FR 20057). In the U.S., nesting mostly occurs in Florida, although it has recently been recorded in North Carolina, at Bald Head Island and the Cape Hatteras National Seashore (NMFS 2012). In 2005, there was also a green sea turtle nest reported in Virginia Beach, Virginia.

Green turtles are the largest of all the hard-shelled sea turtles, but have a comparatively small head. Its carapace is smooth with shades of black, gray, green, brown, and yellow. Adults can grow to four feet in length (carapace length) and weigh up to 440 pounds. Juveniles are omnivorous feeding on both benthic invertebrates as well as algae and sea grasses. Adults are largely herbivorous, feeding on algae and sea grasses. They occur seasonally in mid-Atlantic waters such as the Chesapeake Bay and the Long Island Sound, which serve as foraging and developmental habitat. The principal feeding areas for the species are the west coast of Florida, the Florida Keys, and the Yucatan Peninsula (NMFS 2012). Green turtles have the potential to forage in the Action Area.

According to NMFS, nesting has increased considerably since the 1970s. By far the most important nesting grounds for the Western Atlantic population remains in Costa Rica. In the U.S., nesting mostly occurs in Florida, although it has recently been recorded in North Carolina, at Bald Head Island and the Cape Hatteras National Seashore (NMFS 2012). Its critical habitat in the U.S. is confined to Puerto Rico (NMFS 2012). Only one green sea turtle take has been recorded by USACE during dredging operations in the Atlantic Ocean and/or Chesapeake Bay channels, but no green sea turtle take has ever been reported in the Action Area or in the nearby Norfolk Harbor and Channels.

Hawksbill Sea Turtle. The hawksbill sea turtle was listed endangered in 1970. It is small to medium-sized compared to other sea turtle species, and primarily consumes sponges, invertebrates, and algae. According to NMFS (2012), however, the species is uncommon in continental U.S. waters. It prefers coral reef habitats such as those in the Caribbean and Central America; its designated critical habitat in the U.S. is limited to Puerto Rico. In the continental U.S., nesting is confined to the southeast coast of Florida and the Florida Keys. The species has been documented as far north as Massachusetts; however, these sightings were considered to be strandings after hurricanes and offshore storms. Three hawksbill sea turtles have been documented in Virginia waters since 1979; however, these were not documented to occur in the Chesapeake Bay. Texas and Florida are the only states where sitings occur with any regularity; sitings north of Florida are considered rare. The NMFS determined in 2012 that the species was very unlikely to be found in the Action Area (NMFS 2012).

Kemp's Ridley Sea Turtle. The Kemp's Ridley sea turtle was listed endangered in 1970. According to NMFS, Kemps Ridley is one of the least abundant of the world's sea turtles; it is

mostly found in the Gulf of Mexico and the northwestern Atlantic Ocean. The majority of nesting occurs along a single stretch of beach near Rancho Nuevo, Tamaulipas, Mexico. In the U.S., nesting is typically limited to South Texas (where a record 195 nests were found in 2008) and also occurs infrequently in a few other locations in the U.S. including Virginia. Nesting occurs from April through July each year, with hatchlings emerging after 45-48 days. Once they leave the nesting beach, hatchings are distributed in both Gulf of Mexico and Atlantic Ocean (NMFS 2012).

Adult Kemp's Ridleys are the smallest marine turtle in the world. Their carapaces are often grayish-green, and nearly circular. Each of the front flippers has one claw while the back flippers may have one or two. Adults can reach 24-28 inches in length, and can weigh up to 100 pounds. Developmental habitats are defined by several characteristics, including coastal areas sheltered from high winds and waves such as embayments and estuaries, and nearshore temperate waters shallower than 50 meters. Kemp's Ridleys eat a variety of crab species, with mollusks, shrimp, and fish consumed less frequently (NMFS 2012).

The threats to the species are similar to those of other sea turtle species. Interactions with fisheries may be particularly high for Kemp's Ridleys. In addition, they may be more susceptible to oceanographic-related events such as cold-stunning. From 2006-2010, an average annual rate of 115 Kemp's Ridleys were found cold-stunned on Cape Cod. Populations reached their lowest recorded point in 1985, when fewer than 300 nesting females were identified. Populations began to recover in the 1990s; and by 2006, there were an estimated 7,000-8,000 Kemp's Ridley turtles (NMFS 2012). In 2014, there were a total of 10,986 nests recorded in Mexico, so there is cautious optimism; but not high enough numbers to declassify the species as of yet (NMFS and USFWS 2015).

The NMFS documents that the Chesapeake Bay is among the foraging areas documented for this species. In the Bay, Kemp's Ridleys frequently forage in submerged aquatic grass beds for crabs. During consultation with respect to NMFS had concurred, but indicated that this species was not likely to occur in the Elizabeth River (Navy 2009). Five takes have occurred due to hopper dredges during USACE dredging operations in the Atlantic Ocean and/or the Chesapeake Bay; but no takes have occurred in the Elizabeth River during dredging projects since 1994, when monitoring began (USACE 2016).

Leatherback sea turtle. The leatherback sea turtle was listed as endangered in 1970. They are the largest living turtle species in the world, attaining lengths of up to 6.5 feet, and weighing up to 2,000 pounds. They are also the most migratory and wide-ranging of any sea turtle, ranging from the Atlantic, Pacific, and Indian Oceans, and the Mediterranean Sea. They migrate routinely between the northern temperate and tropical waters. Leatherbacks from the western North Atlantic beaches have been documented as using the entire North Atlantic Ocean. They are known as a pelagic (offshore) species that feeds on jellyfish and tunicates; however, they are also known to use the coastal waters of the continental shelf. They are often sited in temperature ranges similar to those preferred by the loggerhead (7°C to 27°C), however, they also appear to have greater tolerance of cooler water temperatures. In the Caribbean, Atlantic and Gulf of Mexico, leatherback populations are generally increasing. In the continental U.S., the Atlantic coast of Florida is one of the main nesting areas. No leatherback turtle takes have occurred during any USACE dredging operation in the Atlantic Ocean, Chesapeake Bay, or the Elizabeth River as a result of any USACE dredging projects since monitoring began in 1994. Critical habitat in the U.S. is limited to the Virgin Islands (NMFS 2012).

Loggerhead Sea Turtle. The loggerhead sea turtle was listed as threatened in July 1978. The NMFS indicates that the loggerhead is the most abundant species of sea turtle in U.S. waters. The Northwest Atlantic DPS loggerhead is found in temperate and subtropical waters, from Florida to Cape Cod. Aerial surveys of continental shelf waters north of Cape Hatteras showed that loggerheads were most commonly sighted in waters with bottom depths ranging from 22 to 49 meters. However, in more recent survey data and satellite tracking data support that they occur in waters from beach to beyond continental shelf, in a range of habitats including offshore waters, continental shelves, bays, estuaries, and lagoons. They have been observed in waters with surface temperatures of 7°C to 30°C, but water temps of greater than 11°C are most favorable. They occur year-round in the ocean waters of North Carolina, South Carolina, Georgia, and Florida (NMFS 2012).

Loggerheads were named for their relatively large heads. They have powerful jaws that enable them to feed on hard-shelled prey, such as whelks and conch. Their carapaces are slightly heart-shaped and reddish-brown in adults and subadults, while the undersides are generally a pale yellowish color. The neck and flippers are usually dull brown to reddish brown on top and medium to pale yellow on the sides and bottom. Adults can reach lengths of three feet and weigh up to 250 pounds. (NOAA 2016g).

As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the Southeastern U.S., and also move up the U.S. Atlantic coast. They arrive in Virginia foraging areas as early as April and May. The majority of the nesting occurs on beaches of the southeastern U.S. Within its range, nesting season occurs late April to early September and hatching season late June through early November. Juveniles are omnivorous and forage on crabs, mollusks, jellyfish, and vegetation at or near the surface. Subadults and adults are primarily coastal dwelling and typically prey on benthic invertebrates such as mollusks and decapods crustaceans in hard bottom habitats. The loggerhead is a long-lived species with an average life span of 57 years (NMFS 2012).

Threats to species include by-catch in fisheries, interactions with vessels and dredges, oil spills, and other marine pollution in the water; and habitat loss, nesting predation or disturbance that affects eggs, hatchlings, and nesting females on land. Based on a five-year status review of the species, which discussed a variety of threats to loggerheads including climate change, NMFS and FWS determined that they should not be delisted or reclassified. A NMFS model in 2009 had suggested that the populations are most likely declining, although overall nesting population remains widespread, and the trend for nesting population appears to be stabilizing (NMFS 2012).

Critical habitat designated for this species includes the coastlines of Texas, Louisiana, Florida, and North Carolina, and areas well offshore of Mississippi, Alabama in the Gulf of Mexico, and well offshore of Georgia, South Carolina, and Virginia, in the Atlantic Ocean. Therefore, no critical habitat exists within the Action Area (NOAA 2016d).

During consultation with respect to its proposed deepening project from Lambert's Point to NNSY, the Navy (2009) had noted that loggerhead sea turtles regularly occur within the Chesapeake Bay during late spring and summer months. They are known occasionally to be impacted by bottom suction hopper dredges during their transit into and out of the Chesapeake Bay between April and November. According to internal USACE dredging records, loggerhead takes have occurred as a result of USACE dredging operations in the Atlantic Ocean and/or Chesapeake Bay channels since 1994, when monitoring of USACE dredging operations began. However, none of them occurred in the Elizabeth River. During consultation with the

U.S. Navy on their deepening project, NMFS concluded that this species was not likely to occur in the Elizabeth River (Navy 2009).

3.6 LISTED SPECIES AFFECT DETERMINATIONS

3.6.1 BIRDS

3.6.1.1 Piping Plovers and Red Knots

Piping plovers and red knots have the potential to forage, rest, and/or migrate through the Action Area, but do not currently breed in the Action Area. Although piping plovers previously nested at the CIDMMA, the nesting habitat there has degraded and is not currently suitable for piping plover nesting. No future plans to resume the nesting management program to improve the nesting habitat are anticipated. The noise and temporary turbidity plume caused by dredging and dredged material placement actions may cause these birds species to move away from the disturbance; however, we would expect this to be a negligible to minor, and temporary impact that would not substantially impact their long-term foraging or breeding success. The dredging and dredged material placement operations will have a temporary, negligible to minor adverse impact to benthic invertebrates and fish. This could potentially impact some of the prey species of the piping plovers and red knots. The shifts in salinity, temperature, and sea level rise all have the potential to result in shifts in prey species availability which could also cause detrimental effects to these species. However, because of the already disturbed nature of the majority of the Action Area and the amount of other available habitat for prey species, we would not anticipate the Preferred Alternative to have any substantial impact on any prey invertebrate or fish populations.

Another potential threat to this species is injury or incidental take resulting from unexploded ordinance (UXO) detonation or contact with contaminants leaching from UXO that occur in the Action Area. However, we would not anticipate this to be a substantial threat as the USACE deploys UXO screening devices on dredges where there is risk of UXO detonation.

In the future either with our without implementation of the Preferred Alternative the number of vessel calls is anticipated to increase which could increase disturbance impacts to birds foraging or migrating through the area. When comparing the future conditions with implementation of the Preferred Alternative as compared to the future conditions without implementation of the Preferred Alternative, we would expect any disturbances from vessel traffic to be less with implementation of the Preferred Alternative because of the fewer anticipated vessel calls. This type of adverse disturbance impact with implementation of the Preferred Alternative would result in negligible, to minor impacts to listed birds.

Virginia Port growth is anticipated to increase throughout the next 50 years and a new port facility is planned, which may increase the number of vessels transiting the Elizabeth River and Southern Branch Channels. Also, additional development including construction of the Third Crossing and expansion of the Chesapeake Bay Bridge Tunnel, and Craney Island Eastward Expansion is planned in the future. Additional development could increase avian disturbance impacts. However, implementation of the Preferred Alternative is not anticipated to substantially contribute to those increased impacts to listed avian species.

The loss of barriers and beach nesting breeding and foraging habitat anticipated with sea level rise has the potential to impact these species although the level of impact is relatively

uncertain. However, substantial synergistic impacts resulting from implementation of the Preferred Alternative with the impacts of climate change or other cumulative effects are not anticipated.

Therefore, the implementation of the Preferred Alternative may affect, but is not likely to adversely affect the piping plover or the red knot.

3.6.2 FISH

3.6.2.1 Atlantic Sturgeon (all listed Distinct Population Segments) and Atlantic Sturgeon Critical Habitat

In their letter dated August 18, 2016, NMFS stated in their response to USACE request for an official species list, that the Atlantic sturgeon occurs in estuarine and marine waters along the U.S. Atlantic coast and may be present in the vicinity of the project area. Critical habitat for the Atlantic sturgeon was designated in 2017 but the critical habitat is not located in the Action Area.

Atlantic Sturgeon are distributed throughout the Chesapeake Bay and the Chesapeake Bay is a known congregation area for multiple DPSs (NMFS 2012). Therefore, Atlantic Sturgeon could occur in the Action Area. Because spawning is only reported to occur in the James River (NMFS 2012), there is no anticipated Atlantic Sturgeon breeding anticipated within the Action Area. We would not anticipate there to be eggs, larvae, or young of the year in the Action Area based on the location of the known breeding area in the James River and the intolerance of these life stages to salinity (NMFS 2012).

Based on data collected by the USACE, both subadult and adult Atlantic Sturgeon have the potential to become entrained in dredging equipment. When entrainment occurs, it will typically result in mortality to the Atlantic Sturgeon. Entrainment is defined as the direct uptake of aquatic organisms by the suction field generated at the suction intake or the uptake of aquatic organisms by mechanical dredging. The size and suction power of the dredge, the condition of the substrate being dredged, and the method of operations of the dredge all relate to the potential of the dredge to entrain Atlantic Sturgeon (Reine and Clarke 1998).

The method of dredging contributes to the risk of entrainment. Hydraulic pipeline dredges are not likely to pose a significant threat to adult or subadult Atlantic sturgeon occurring in marine or estuarine waters where young or juvenile sturgeon are absent. The dredge suction intake is generally shielded by the cutterhead itself which is designed to loosen sediments and feed the material inward towards the suction intake. Additionally, the slow forward advancement of the hydraulic pipeline dredge plant relative to hopper dredging operations further reduces the likelihood of interactions with Atlantic sturgeon. Adult and subadult Atlantic sturgeon likely have the ability and swimming stamina to avoid interactions and possible entrainment. Likewise, mechanical dredging is not believed to pose a significant threat to adult or subadult Atlantic sturgeon occurring in marine or estuarine waters where young or juvenile sturgeon are absent.

Entrainment of Atlantic sturgeon during hydraulic pipeline dredging and mechanical dredging operations in federal navigation channels appears to be relatively rare. During the period of 1990 to 2012, eight USACE Districts monitored dredging projects for incidental takes of all sturgeon species: Mobile, Jacksonville, Savannnah, Charleston, Wilmington, Norfolk, New

York, and Philadelphia. The effort documented a total of 35 incidental takes of sturgeon species (all sturgeon species) on monitored projects for all types of dredge plant (mechanical, hydraulic pipeline, and hopper dredge). The majority of the takes resulted from hopper dredging; six of the 35 documented observed takes were sturgeon species incidentally taken with pipeline dredge plants and five of the 35 sturgeon takes were by mechanical dredge plants.

The USACE Norfolk District and Baltimore District hopper dredging projects have been monitored in the Chesapeake Bay from 1994 to 2012. During this period approximately 17 million cubic yards of dredged material have been removed from these federal navigation channels in the lower Chesapeake Bay with two documented Atlantic sturgeon incidental takes resulting from hopper dredging operations.

No hopper dredging is planned in the Action Area (only hydraulic cutterhead with pipeline and mechanical dredging). The USACE has not detected any entrained sturgeon based on monitoring of hydraulic cutterhead pipeline discharges into the CIDMMA for the past four years. Based on the results of the monitoring and also that no hopper dredging is planned, we would not anticipate entrainment of Atlantic sturgeon.

The resulting turbidity plume that would result temporarily from dredging and dredged material placement operations may temporarily cause sturgeons to leave the disturbance area and may prevent them from foraging in this area. Also, dredging actions may temporarily reduce prey availability. Reductions in Dissolved Oxygen pose a potential threat to Atlantic Sturgeon that can be particularly exacerbated during periods of high temperature. Deep draft dredging actions do have the potential to modify circulation patterns and Dissolved Oxygen levels. Modeling conducted by the VIMS (Wang et al. 2017) to assess potential hydrodynamic effects and water quality affects associated with the dredging show only negligible effects to Dissolved Oxygen and also indicate that following dredging operations, there may be a slight increased level in Dissolved Oxygen levels in the Lafayette River from increased flushing.

There is a potential for vessel interactions to occur with dredging vessel/equipment. Due to the open-water environment of the Port of Hampton Roads, the likelihood of sturgeon dredging vessel/equipment strikes is possible but is not anticipated to be a substantial threat due to the limited amount of time the dredging vessels will be operating, the anticipated low speed of the dredging vessels (approximately 10 knots and less), the ability of subadult and adult sturgeon to move away from dredging impacts, and the limited draft of the dredging vessels. No known or reported vessel strikes have occurred in the Action Area from USACE dredging operations. Atlantic Sturgeon interactions with vessels has been documented to occur in the James River (Balazik et al. 2017). The Balazik et al. (2017) study was conducted in the freshwater portion of the James River from 2007-2010 from 31 carcasses of Adult Atlantic Sturgeon. Twenty-six of the carcasses had scars from propellers and five were too decomposed to determine the cause of death. Nearly all of the carcasses were recoverd (84%) from a narrow reach that was modified to enhance shipping efficiency. Balazik et al. (2017) indicated that the vessel interactions were likely caused by deep draft vessels because of the benthic nature of Atlantic Sturgeon based on the telemetry study.

Sea turtle relocation trawling could result in the incidental capture of Atlantic Sturgeon, however, all sturgeon would be immediately placed back into the water and no mortality of Atlantic Sturgeon would be anticipated from relocation trawling.

The impact to Atlantic sturgeon from dredging equipment and the associated noise has not been well documented. However, existing studies demonstrate no impact to behavior, spawning, feeding, or movement of any Atlantic sturgeon within the vicinity of active dredging operations (Moser and Ross 1995). Moser and Ross (1995) concluded that Atlantic sturgeon showed no difference in habitat preference or behavior between the dredged and undisturbed areas during dredging operations. The conclusions are consistent with USACE studies conducted on the James River with active dredging operations. The findings of this study showed no change in behavior or movement as a result of an active dredge operating within close proximity to radio-tracked Atlantic sturgeon (unpublished USACE 2009).

Another potential threat to this species is injury or incidental take resulting from UXO detonation or contact with contaminants leaching from UXO that occur in the Action Area. However, we would not anticipate this to be a substantial threat as the USACE deploys UXO screening devices on dredges where there is risk of UXO detonation.

Potential cumulative threats to Atlantic Sturgeon include ship strikes from commercial and recreational vessels, as well as hopper dredging impacts that occur throughout the entire range of the Atlantic Sturgeon and exposure to contaminants such as oil spills. Another potential cumulative impact to consider is impacts that occur from fishery entanglement. While some of these threats have the potential to impact Atlantic Sturgeon populations, implementation of the Preferred Alternative is not anticipated to substantially contribute cumulatively to injuries and mortalities resulting from these impacts. In the future either with our without implementation of the Preferred Alternative, deep draft vessel calls are anticipated to increase which could potentially increase strike risks to Atlantic Sturgeon. However, any potential strike risks from deep draft vessels would be less with implementation of the Preferred Alternative as compared to future conditions without the Preferred Alternative because of the anticipated reduction in deep draft vessel calls.

Virginia Port growth is anticipated to increase throughout the next 50 years and a new port facility is planned, which may increase the number of vessels transiting the Elizabeth River and Southern Branch Channels. Also, additional development including construction of the Third Crossing and expansion of the Chesapeake Bay Bridge Tunnel is planned in the future. Additional development could increase impacts to the Atlantic Sturgeon. However, implementation of the Preferred Alternative is not anticipated to substantially contribute to those increased impacts to Atlantic Sturgeon.

Global climate change has the potential to affect all DPSs of the Atlantic Sturgeon in the future, however, the threat may be greatest to the South Atlantic and Carolina DPSs. Sea level rise may cause a rise in salinity in upstream areas that could affect breeding sites and survival of early life stages (eggs, larvae, and young of the year). There could be shifts in breeding habitat availability and timing and the effects of this change on the Atlantic Sturgeon could be detrimental although relatively uncertain at this time. The shifts in salinity, temperature, and sea level rise all have the potential to result in shifts in prey species availability which could also cause detrimental effects to the Atlantic Sturgeon. No synergistic or cumulative impacts of implementation the Preferred Alternative with other past, present, or future projects are anticipated.

Therefore based on our analysis, implementation of the Preferred Alternative may affect, but is not likely to adversely affect, the Atlantic Sturgeon. There will be No Affect to designated Atlantic Sturgeon Critical Habitat as the Action Area is located outside of the designated critical habitat.

3.6.2.2 Shortnose Sturgeon

Shortnose sturgeons are not anticipated to occur in the Action Area. There have been numerous sampling studies to document the presence of Atlantic Sturgeon in Virginia waters (NMFS 2012); however, based on these studies, any shortnose sturgeon in the Action Area would be considered a rare occurrence. Also, based on the USACE dredging entrainment records and dredged material monitoring that has occurred for the past four years of dredged material pumped from the Action Area to the CIDMMA, no shortnose sturgeon injuries, take, or observations of any kind have been reported. Therefore, because of the rarity of the occurrence, we would anticipate any effects to the shortnose sturgeon to be discountable. No cumulative or synergistic impacts of implementation the Preferred Alternative with other past, present, or future projects are anticipated.

Therefore, implementation of the Preferred Alternative may affect, but is not likely to adversely affect the shortnose sturgeon.

3.6.3 MAMMALS

3.6.3.1 Blue Whale, North Atlantic Right Whale, and Sperm whale

Because no resident blue whale, Atlantic right whale, or sperm whale populations occur in the Action Area and due to the predominant offshore distribution of these species, the presence of any of these whale species in the Action Area would be considered a rare and unlikely occurrence. Based on our review of the marine mammal stranding data and survey data conducted within a portion of the Action Area, there is no documented account of these species in the Action Area (Swingle et al. 2017-2009;). Any potential effects to these species would be discountable.

Therefore, the implementation of the Preferred Alternative may affect, but is not likely to adversely affect the blue whale, north Atlantic right whale, or sperm whale.

3.6.3.2 Fin Whale and Sei Whale

Because of the predominant offshore habitat preferences of fin and sei whales, the presence of them in the Action Area would be considered a rare and temporary occurrence and the potential for interaction with dredging vessels and equipment would be possible but highly unlikely. Table 3 provides the documented fin and sei whale strandings in the Action Area and surrounding areas as reported by the Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program from 2008-2016 (Swingle et al. 2017-2010). The results are depicted in Figure 6 as well. We used a five mile buffer from the federal navigation channel clipped to adjacent shorelines to conduct this analysis in ArcMap 10.4.1. Please note that other nonlisted marine mammals are provided in Table 3 and Figure 6 for informational purposes only.

Table 3. Marine mammal strandings in the Action Area and surrounding areas, 2008-2016 (Swingle et al. 2017-2010). Strandings of federally listed species in the Action Area are highlighted in blue.

	Location									
Species/Taxonomic Group	**CHC, NHC & Placement Areas Intersect**	**CHC /YSC & NHC Intersect**	**CHC /YSC Only**	**ERSB & Placement Areas Intersect**	**ERSB Only**	**ERSB, NHC & Placement Areas Intersect**	**NHC & Placement Areas Intersect**	**NHC Only**	**Placement Areas Only**	**Total**
bottlenose dolphin	3	65	7	1	0	4	32	154	180	446
common dolphin	0	2	0	0	0	1	0	5	4	12
dwarf sperm whale	0	0	0	0	0	0	1	0	4	5
fin whale	0	0	0	0	0	0	0	1	0	1
gray seal	0	1	0	0	0	0	0	1	2	4
harbor seal	0	0	1	0	0	0	0	6	2	9
harbor porpoise	0	1	0	0	0	0	3	1	27	32
harp seal	0	0	0	0	0	0	0	2	3	5
humpback whale	0	1	2	0	0	0	0	0	4	7
minke whale	0	0	0	1	0	0	0	0	0	1
pilot whale	0	0	0	0	0	1	0	0	0	1
pygmy killer whale	0	2	0	0	0	0	1	0	0	3
pygmy sperm whale	0	0	0	0	0	0	0	1	1	2
Risso's dolphin	0	0	0	0	0	0	0	0	2	2
sei whale	0	0	0	0	0	1	0	0	1	2
Sowerby's beaked whale	0	0	0	0	0	0	0	1	0	1
sperm whale	0	0	0	0	0	0	0	0	1	1
striped dolphin	0	0	0	0	0	0	0	1	1	2
unidentifiable delphinid	0	0	0	0	0	0	1	1	0	2
unidentifiable *Kogia*	0	0	0	0	0	0	0	1	0	1

CHC=Cape Henry Channel; ERSB=Elizabeth River and Southern Branch (Action Area); NHC=Norfolk Harbor Channel; YSC=York Spit Channel

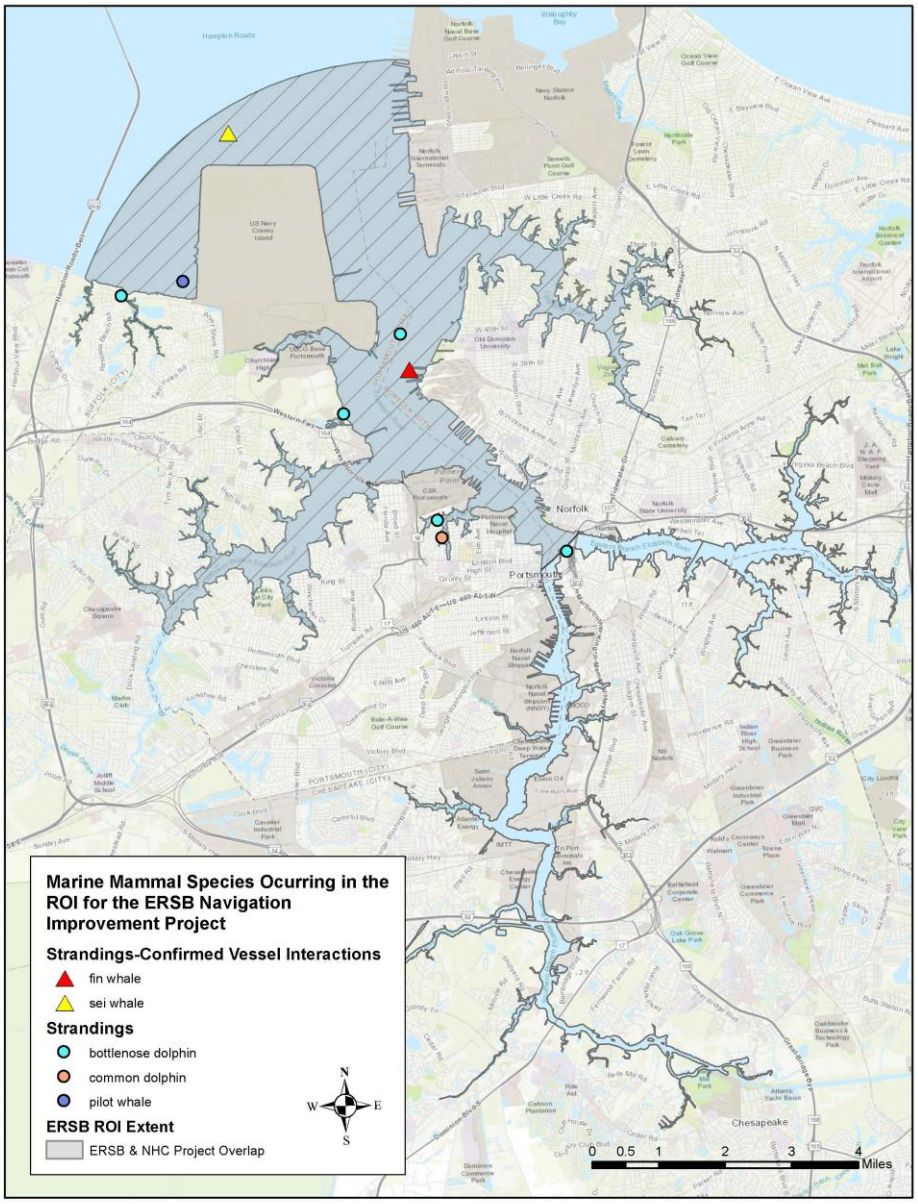

Figure 6. Marine mammal strandings reported in the Action Area and surrounding areas caused by vessel interactions, 2003-2017 (Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program). Strandings of federally listed species in the Action Area are highlighted in blue.

The reported strandings caused by vessel interactions that were reported in the Action Area and surrounding areas from 2003-2017 are provided in Table 4 and depicted in Figure 6. Because this is stranding data, it is uncertain where the vessel interaction occurred and therefore, it is uncertain if these occurred in the Action Area. Please note that other nonlisted marine mammals provided in Table 4 and Figure 6 are provided for reference purposes only.

Table 4. Marine mammal vessel interactions reported to occur in the Action Area, 2003-2017 (Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program 2017).

	Location									
Species	**CHC, NHC & Placement Areas Intersect**	**CHC/ YSC & NHC Intersect**	**CHC/ YSC Only**	**ERSB & Placement Areas Intersect**	**ERSB Only**	**ERSB, NHC & Placement Areas Intersect**	**NHC & Placement Areas Intersect**	**NHC Only**	**Placement Areas Only**	**total**
bottlenose dolphin	0	0	0	0	0	0	0	2	1	3
fin whale	0	0	0	0	0	1	0	1	1	3
humpback whale	0	2	2	0	0	0	1	1	1	7
minke whale	0	0	0	0	0	0	0	0	1	1
northern right whale	0	0	0	0	0	0	1	0	0	1
sei whale	0	0	0	0	0	1	1	0	1	3

CHC=Cape Henry Channel; ERSB=Elizabeth River and Southern Branch (Action Area); NHC=Norfolk Harbor Channel; YSC=York Spit Channel

Based on our review of the stranding data, there was one sei whale stranding that resulted from a vessel interaction and one fin whale stranding that resulted from a vessel interaction in the Action Area (Swingle et al. 2017-2010; Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program 2017b). Because this is stranding data, the location of the strike is unknown and it is uncertain if the vessel strikes to the whales occurred in the Action Area.

The speed of vessels is a factor thought to affect the potential risk for whales and vessel interactions. The NMFS (2017) reports that overall, most ship strikes of large whale species occurred when ships were traveling at speeds of 10 knots or greater and that collisions are more likely to occur with ships traveling at speeds of 14 knots or greater. Based on NMFS (2017), the average vessel speed that resulted in injury or mortality to large whales was 18.6 knots. There is a speed restriction of six knots in a portion of Segment 1 in the Action Area that extends from the junction of the Southern and Eastern Branches of the Elizabeth River and the Norfolk and Portsmouth Belt Line Railroad Bridge between Chesapeake and Portsmouth, Virginia. However, speed restrictions are not in place in the other portions of the Action Area. Also, whale strikes have also been recorded to occur at speeds of only two knots (Jensen and Silber 2003); therefore, even with the vessel speed restriction, the risk of a whale strike is likely reduced but not eliminated. In general, at higher speeds, vessel operators may have less opportunity to detect and avoid interactions with whales (Whale and Dolphin Conservation Society 2006). Likewise, whales would also have less opportunity to detect and avoid interactions as well. Vessel interactions could result in injury or mortality to the whale. Also, the vessel interactions could result in a disturbance effect where there would be a disruption to whale behavior and could potentially cause a whale movement out of the area.

The size of vessels, type of whale species, and age and gender of the whale may be contributing risk factors for whale interactions with vessels (NMFS 2017; Laist et al. 2001). Vessel interactions with whales has been reported to occur for a variety of vessel types including cargo ships, ferries, cruise liners, navy ships, recreational vessels, fishing boats, whale-watch vessels, research vessel, and non-motorized vessels (Whale and Dolphin Conservation Society 2006; Jensen and Silber 2003). Laist et al. (2001) also reported that all sizes and types of vessels can hit whales but indicated that the most serious injuries and mortalities were caused by ships that are 80 meters in length or longer. The quantity of the largest TEU ships is not anticipated to increase in the future without versus the future with project. However, the quantity of some of the Panamax-size ships may decrease when comparing the future with project versus the future without project. This is because of the increased efficiency of cargo loading in the future with project condition. Therefore, with implementation of the future with project we would not anticipate an increased whale strike rate from a shift in vessel size; this is not an anticipated impact. Laist et al. (2001) reported that fin whales are the species most likely to be hit by vessels and that right whales, humpback whales, sperm whales, and gray whales are commonly hit. This may be related to the whales foraging behavior or potentially the time spent at the surface. It could also be related to the swimming speed of the whale in relation to the speed of the vessel. The whales behavior may be a contributing strike risk factor as well because whales that are foraging, socializing, or mating may be distracted enough to not notice an oncoming vessel (Whale and Dolphin Conservation Society 2006). Another potential contributing factor that could affect whale and vessel interactions is the age and gender of the whale; the Whale and Dolphin Conservation Society (2006) reported that juveniles and mothers may be greatest risk for collision.

We would anticipate a potentially higher risk of vessel interactions with fin and sei whales in the future either with or without implementation of the Preferred Alternative because the predicted number of deep draft vessel calls is anticipated to increase. In comparison of the future with and without implementation of the Preferred Alternative, we would anticipate the potential for fewer vessel strikes with the Preferred Alternative because of the reduced vessel calls as compared to the future without project conditions. Because it is uncertain from the whale and vessel interaction stranding where strikes have occurred, it is difficult to estimate potential future increases in vessel interactions that could potentially occur. Because vessel speeds are not anticipated to increase with implementation of the Preferred Alternative we would not anticipate that the strike risk hazard to increase from increased vessel speed but rather just the sheer potential of impact from the increased future number of vessel calls compared to existing conditions.

Within a noisy harbor area such as the Elizabeth River and Southern Branch, ongoing exposure to underwater noise may cause causing a masking effect such that the noise of an oncoming vessel may not be detected (Whale and Dolphin Conservation Society 2006). Whales may often habituate to the noisy harbor and simply not respond to an oncoming vessel as they are so adapted to the sound of vessels (Whale and Dolphin Conservation Society 2006). In addition, the noise of the dredging vessel/equipment and also the vessels in the harbor itself has an adverse effect to listed whales in the Action Area and may interfere with their ability to communicate and forage for prey in addition to the vessel strike risks.

We would anticipate a potentially higher risk of noise related impacts to fin and sei whales in the future either with or without implementation of the Preferred Alternative because the predicted number of vessel calls is anticipated to increase. In comparison of the future with and without implementation of the Preferred Alternative, we would anticipate the potential for

noise related impacts to be less with the Preferred Alternative because of the reduced vessel calls as compared to the future without project conditions.

Another potential threat to these species is injury or incidental take resulting from UXO detonation or contact with contaminants leaching from UXO that occur in the Action Area. However, we would not anticipate this to be a substantial threat as the USACE deploys UXO screening devices on dredges where there is risk of UXO detonation.

Potential cumulative threats to whales include ship strikes and noise impacts from commercial and recreational vessels that occur throughout the entire range of the whale populations and exposure to contaminants such as oil spills. Another potential cumulative impact to consider is impacts that occur from fishery entanglement. While some of these threats have the potential to impact whale populations, implementation of the Preferred Alternative is not anticipated to substantially contribute cumulatively to injuries and mortalities resulting from these impacts.

Virginia Port growth is anticipated to increase throughout the next 50 years and a new port facility is planned, which may increase the number of vessels transiting the Elizabeth River and Southern Branch Channels. Also, additional development including construction of the Third Crossing and expansion of the Chesapeake Bay Bridge Tunnel, and the Craney Island Eastern Expansion is planned in the future. Additional development could increase the risks of whale impacts from noise impacts and ship strikes. However, implementation of the Preferred Alternative is not anticipated to substantially contribute to those increased impacts to whales.

Therefore, the implementation of the Preferred Alternative may affect, but is not likely to adversely affect the fin whale and the sei whale.

3.6.3.3 Northern Long-Eared Bat

The Action Area is restricted to subtidal habitat and the CIDMMA and offsite upland disposal facilities. These areas would not provide suitable roosting or nesting habitat for the northern long-eared bat. There is no known hibernacula in the Action Area. It is unknown if the northern long-eared bat migrates through the Action Area, however, this seems unlikely as this would not be their preferred nesting or foraging habitat. *Therefore, implementation of the Preferred Alternative is anticipated to have no effect on the northern long-eared bat.*

3.6.3.4 West Indian Manatee

Because the West Indian manatee is so unlikely to occur in the Action Area, it is unlikely there would be any interactions or impacts to this species. There are no data indicating that dredging, or dredged material placement, or turtle trawling relocation efforts has ever impacted any manatees.

The presence of a West Indian manatee in the Action Area would be considered an unlikely occurrence. Because there is no Submerged Aquatic Vegetation in the Action Area, there is no foraging habitat for manatees. Therefore, effects would be discountable to the manatee.

Therefore, the implementation of the Preferred Alternative may affect, but is not likely to adversely affect the West Indian Manatee.

3.6.4 SEA TURTLES

3.6.4.1 Green Sea Turtle, Hawksbill Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle, and Loggerhead Sea Turtle

In their letter dated August 18, 2016, NMFS stated in their response to USACE request for an Official Species List that the loggerhead, Kemps Ridley, and green sea turtles occur seasonally in the Chesapeake Bay and its tributaries and coastal Virginia waters, during the warmer months. As the Elizabeth River is a tributary to the Bay, sea turtles could potentially be in the Action Area from April through mid-November with the greatest number of sea turtles present from June through October (NMFS 2012). We would anticipate that of these species, the greatest likelihood of occurrence would be juvenile loggerhead turtles; it is less likely that adult loggerheads, juvenile Kemp's Ridley, or adult green sea turtles would occur in the Action Area.

As stated earlier in this Biological Assessment, both hawksbill and leatherback sea turtles would be very rare to occur in the Action Area, and impacts would be considered to be highly unlikely. There has been no reported interaction of hawksbill turtles during dredging or trawling relocation associated with any of the dredging or dredged material placement activities conducted within or outside of the Action Area, for any of USACE's dredging projects. Based on our review of the Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program sea turtle stranding data collected from 2008-2016 (Swingle et al. 2017-2010), there is no reported stranding of either of these species in the Action Area. Effects to hawksbill and leatherback sea turtles would be discountable. *The implementation of the Preferred Alternative may affect but is not likely to adversely affect the hawksbill or leatherback sea turtles.*

Benthic resources that serve as prey items for sea turtles can be entrained by dredging operations. For the remaining listed sea turtles anticipated to occur in the Action Area, sea turtles could be foraging in the Action Area on benthic species, including crabs and mollusks. Therefore, the dredging actions may temporarily reduce local prey communities used by foraging sea turtles.

There is a potential for vessel interactions to occur with our dredging vessel. Table 5 provides the documented sea turtle strandings in the Action Area and surrounding areas as reported by the Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program from 2008-2016 (Swingle et al. 2017-2010). The results are depicted in Figure 7 as well. We used a five mile buffer from the federal navigation channel clipped to adjacent shorelines to conduct this analysis in ArcMap 10.4.1.

Table 5. Sea turtle stranding in the Elizabeth River and Southern Branch Navigation Improvements Action Area and surrounding areas, 2008-2016 (Swingle et al. 2017-2010).

	Location									
Species/ Taxonomic Group	**CHC, NHC & Placement Areas Interseect**	**CHC/YSC & NHC Intersect**	**CHC/YSC Only**	**ERSB & Placement Areas Intersect**	**ERSB Only**	**ERSB, NHC & Placement Areas Intersect**	**NHC & Placement Areas Intersect**	**NHC Only**	**Placement Areas Only**	**total**
green	0	12	0	0	0	1	1	21	16	51
Kemp's ridley	0	36	9	2	0	1	18	148	117	331
leatherback	1	12	1	0	0	0	0	3	7	24
loggerhead	1	64	14	1	0	13	44	245	210	592
unidentifiable	0	1	1	0	0	0	1	26	3	32

CHC=Cape Henry Channel; ERSB=Elizabeth River and Southern Branch (Action Area); YSC=York Spit Channel

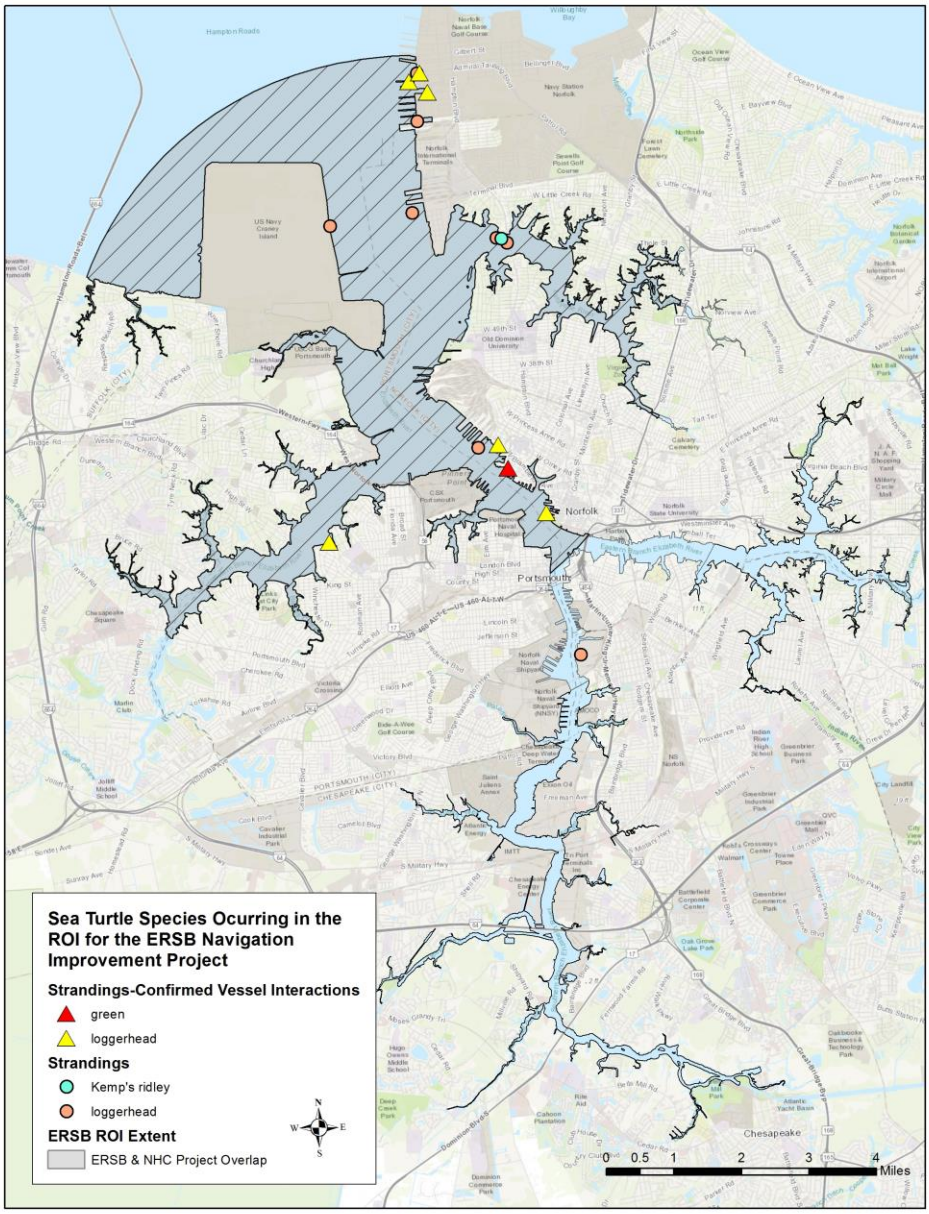

Figure 7. Sea turtle strandings reported in the Action Area and surrounding areas caused by vessel interactions, 2008-2016 (Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program 2017).

The reported strandings caused by vessel interactions that were reported in the Action Area from 2008-2016 are provided in Table 6 and depicted in Figure 7. Because this is stranding data, it is uncertain where the vessel interaction occurred and therefore, it is uncertain if these occurred in the Action Area.

Table 6. Sea turtle vessel interactions reported to occur in the Action Area, 2008-2016 (Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program 2017).

	Location									
Species	**CHC, NHC & Placement Areas Intersect**	**CHC/YSC & NHC Intersect**	**CHC/YSC Only**	**ERSB & Placement Areas Intersect**	**ERSB Only**	**ERSB, NHC & Placement Areas Intersect**	**NHC & Placement Areas Intersect**	**NHC Only**	**Placement Areas Only**	**total**
green	0	3	0	0	0	1	0	9	7	20
Kemp's Ridley	0	15	1	0	0	0	7	61	28	112
leatherback	0	2	0	0	0	0	0	0	5	7
loggerhead	1	38	4	0	0	6	25	141	109	324

CHC=Cape Henry Channel; ERSB=Elizabeth River and Southern Branch (Action Area); YSC=York Spit Channel

Based on this analysis, the majority of the stranded turtles in the action area were loggerheads followed by Kemp's ridley and green sea turtles. No reported leatherback or hawksbill turtle strandings were reported during 2009-2016 per Swingle et al. (2017-2010). This data also indicates a much higher reporting of strandings in areas not located in but adjacent to the action area in the Norfolk Harbor and Channels.

There is a speed restriction of six knots in a portion of Segment 1 in the Action Area that extends from the junction of the Southern and Eastern Branches of the Elizabeth River and the Norfolk and Portsmouth Belt Line Railroad Bridge between Chesapeake and Portsmouth, Virginia. However, speed restrictions are not in place in the other portions of the Action Area. Also, even within the speed restricted area, there is a potential for sea turtle and vessel interaction. Vessel interactions could result in injury or mortality of the sea turtle. The Virginia Aquarium Foundation/Virginia Aquarium Stranding Response Program works to rehabilitate and rerelease rehabilitated turtles when possible.

The risk of injury to sea turtles from collisions with dredge-related vessels is considered discountable considering the species mobility and slow speed of the dredge vessels (10 knots or less) and associated dredging equipment. No sea turtle vessel collisions with dredge-related vessels has ever been reported to occur in the Action Area from dredging operations. With implementation of the project, the number of deep draft vessel calls is anticipated to decrease in the future with project as compared to the future without project conditions. This could potentially reduce the number of collisions of sea turtles with deep draft vessels in the future. Because vessel speeds are not anticipated to increase with implementation of the

Preferred Alternative we would not anticipate that the strike risk hazard to increase from increased vessel speed.
Another potential threat to these species is injury or mortality resulting from UXO detonation or contact with contaminants leaching from UXO that occur in the Action Area. However, we would not anticipate this to be a substantial threat as the USACE deploys UXO screening devices on dredges where there is risk of UXO detonation.

No sea turtle nesting is located in the Action Area. Also, no Submerged Aquatic Vegetation, a preferred food source for adult, herbivorous green sea turtles occurs in the Action Area. Sea turtle entrainment is not anticipated with implementation of the Preferred Alternative because no hopper dredging would occur in the Action Area.

Sea turtle takes reported in U.S. Army Corps of Engineers, Norfolk District Dredging Operations from 1992 – 2012 are documented in NMFS (2012). These records show that no sea turtle takes have previously occurred in the Action Area as a result of USACE dredging projects. However, potential injury and take resulting from entrainment to sea turtles outside of the Action Area should be considered for the cumulative impacts analysis. During this time period, there were 17 reported sea turtle takes that resulted from hopper dredging operations, within the Norfolk Harbor channel system. These takes occurred solely in the Thimble Shoal Channel. Most of the takes (14) consisted of loggerhead sea turtles; there was also one reported take of a Kemp's Ridley sea turtle and there were two sea turtle takes where the species could not be determined. During the reporting time period, observer coverage was not 100% so turtle mortality may have been underestimated; also it is possible that not all sea turtles that are killed by the dredge are observed (NMFS 2012). For example, a dredge could crush a sea turtle causing injuries or mortality (NMFS 2012).

Outside of the Action Area in the Norfolk Harbor and Channels, sea turtle relocation trawling may be done to minimize the number of sea turtles entrained during dredging operations. This is another potential cumulative impact to sea turtles. Relocation trawling is thought to be an effective method to minimize sea turtle interactions with dredging equipment when there is a high abundance of sea turtles in the area (NMFS 2012). Relocation trawling will be required if two sea turtles are entrained in one 24-hour period or when four sea turtles are entrained in a two month period or in situations where there is an unusual high abundance of sea turtles that could results in higher than anticipated entrainment rates. Relocation trawling may cause some stress to the sea turtles and the effects of this stress are not fully understood. Only one mortality of a sea turtle has ever been recorded that was likely due to relocation trawling conducted by the Norfolk District. It was a Kemp's Ridley turtle that had a blunt force trauma to the head.

Other potential cumulative threats to sea turtles include ship strikes from commercial and recreational vessels as well as dredging vessel/equipment impacts that occur throughout the entire range of the sea turtles and exposure to contaminants such as oil spills. Another potential cumulative impact to consider is impacts that occur from fishery entanglement. While some of these threats have the potential to impact sea turtle populations, implementation of the Preferred Alternative is not anticipated to substantially contribute cumulatively to injuries and mortalities resulting from these impacts.

Virginia Port growth is anticipated to increase throughout the next 50 years and a new port facility is planned, which may increase the number of vessels transiting the Elizabeth River and Southern Branch Channels. Also, additional development including construction of the Third Crossing and expansion of the Chesapeake Bay Bridge Tunnel, and the Craney Island Eastern

Expansion is planned in the future. Additional development could increase the risks of sea turtle impacts from disturbance, noise impacts and vessel interactions. However, implementation of the Preferred Alternative is not anticipated to substantially contribute to those increased impacts to sea turtles.

Sea level rise may result in a loss of sea turtle beach nesting habitat. The future implications and amount of loss is uncertain at this time but pose an imminent threat to sea turtles who tend to return repeatedly to natal nesting locations. Impacts are further amplified by habitat loss that has occurred due to developing shorelines that also includes lighting impacts. Lighting along shorelines has the potential to disturb turtles from properly navigating to natal beach locations. There could also be shifts in foraging habitats as the aggregation off benthic communities and Submerged Aquatic Vegetation shift in response to sea level rise. Temperature shifts resulting from climate change have the potential to shift male/female proportions in sea turtle populations as temperature is a driving factor determining sex ratios at nesting sites. The shifts in salinity, temperature, and sea level rise all have the potential to result in shifts in prey species availability which could also cause detrimental effects to sea turtles. Overall, however, implementation of the Preferred Alternative is not anticipated to have substantial cumulative or synergistic cumulative impacts with those caused by sea level rise.

In conclusion, implementation of the Preferred Alternative may affect, but is not likely to adversely affect the green sea turtle, the Kemp's Ridley sea turtle, and the loggerhead sea turtle.

3.7 BEST MANAGEMENT MEASURES

Below are the best management measures planned with implementation of the Preferred Alternative for protection of listed sturgeon, whales, and sea turtles.

- The NMFS will be contacted three days prior to the commencement of any dredging operations to ensure all appropriate reporting forms will be used.
- If a sea turtle is observed within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle. Operation of any mechanical construction equipment shall cease immediately if a sea turtle is observed within a 50 feet radius of the equipment. Activities may not resume until the sea turtle has departed the project area of its own volition.
- Any collision with and/or injury to a sea turtle or sturgeon shall be reported within 24 hours to the NMFS's Protected Resources Division.
- UXO screening devices shall be used on dredging equipment in locations and with a potential threat of UXO detonation as defined by the USACE.

4.0 SPECIES SUMMARY CONCLUSION TABLE.

Table 7 provides the summary species conclusion table and also documents the bald eagle findings as required by the U.S. Fish and Wildlife Service.

Table 7. Summary Species Conclusion Table.

Species/Resource Name	Conclusion	Notes/Documentation
Piping Plover and Red Knot,	May Affect, Not Likely to Adversely Affect	The project may slightly impact flight and foraging behaviors but would have a negligible to minor impact.
Atlantic Sturgeon	May Affect, Not Likely to Adversely Affect	Because of the slow speed of the dredging vessels and dredging equipment, collisions would be unlikely. Dredging may impact prey species and cause sturgeon to leave the Action Area from the dredging turbidity plume and noise. However, dredging is not anticipated to substantially affect any foraging behaviors.
Shortnose Sturgeon	May Affect, Not Likely to Adversely Affect	Species would not likely occur in the Action Area. Effects would be discountable.
Blue whale, north Atlantic right whale, sperm whale	May Affect, Not Likely to Adversely Affect	These species would not likely occur in the Action Area. Effects would be discountable.
Fin Whale, Sei Whale	May Affect, Not Likely to Adversely Affect	Whales would be a rare occurrence in the Action Area. Because of the slow speed of the dredging vessels and dredging equipment, collisions would be unlikely. Dredging may temporarily impact prey species and cause whales to leave the Action Area from the dredging turbidity plume and noise disturbances. However, dredging is not anticipated to substantially affect any foraging behaviors.
West Indian manatee	May Affect, Not Likely to Adversely Affect	Manatees would be transient species and would not likely occur in the Action Area. Effects would be discountable.
Northern long-eared bat	No Effect	There no suitable foraging or roosting habitat in the Action Area. There is no hibernacula in the Action Area. The project

Species/Resource Name	Conclusion	Notes/Documentation
		would not affect flights if they occur in this area.
Hawksbill sea turtle, leatherback sea turtle	May Affect, Not Likely to Adversely Affect	These species would not likely occur in the Action Area. Effects would be discountable.
Sea Turtles: Green, Kemp's Ridley, Leatherback, and Loggerhead	May Affect, Not Likely to Adversely Affect	Because there is no hopper dredging in the Action Area, turtle entrainment would not be anticipated. Dredging may temporarily impact prey species and cause sea turtles, if present, to leave the Action Area from the dredging turbidity plume and disturbance. However, dredging would not substantively affect any foraging behaviors. Collisions with dredging vessels or dredging equipment would be unlikely. No nesting occurs in the Action Area.
Bald eagle	Unlikely to disturb nesting bald eagles. Does not intersect with eagle concentration area.	No bald eagle nests exist within the Action Area or within three miles of the CIDMMA.
Candidate species	No effect; No species present.	

5.0 REFERENCES

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Appendix A – Coordination and Consultation Correspondence

Appendix B – Virginia Fish and Wildlife Information Service, Information, Planning and Consultation System, and Virginia Natural Heritage Species Lists