APPENDIX D

SECTION 7 CONSULTATION AND ESSENTIAL FISH HABITAT (EFH) EVALUATION

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SECTION 7 CONSULTATION

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DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

REPLY TO
ATTENTION OF

May 2, 2006

Regulatory Branch

Mr. Pat Scida
Endangered Species Coordinator
National Marine Fisheries Service
Northeast Regional Office
Protected Resources Division
One Blackburn Drive
Gloucester, MA 01930

Dear Mr. Scida:

In continued coordination on the proposed Masonville Dredged Material Containment Facility (DMCF) and as required by Section 7 of the Endangered Species Act (ESA), find enclosed the Biological Assessment for the proposed action. The purpose of this letter is to continue consultation under Section 7 of ESA regarding threatened and endangered species of concern in the Patapsco River and proposed DMCF area. The Biological Assessment focuses on species identified in your letters dated October 11, 2005 to EA Engineering, and your most recent letter to me dated March 23, 2006.

Based on the available information, it is unlikely that shortnose sturgeon will be affected by this proposal. There are several key sturgeon habitat requirements that are not found in the project area, such as the area does not have suitable cobble spawning habitat, it is too shallow for a thermal refuge, and it is not a unique feeding area. Consequently, the proposed project would not affect shortnose sturgeon.

Based on available information, data indicates the presence of sea turtles in the project area is unlikely and the proposed project area does not provide particularly valuable habitat for these species. Sea turtles are not known to nest in this part of the Bay. No hopper dredging is being performed as part of this project. Consequently, the proposed project would not affect sea turtles.

Based on the available information, it is unlikely that any listed whales will be affected by this proposal. Increases in ship traffic that can be associated with the project are difficult to ascertain, but the overall increase in ship traffic is not expected to impact listed whale species due to the relatively low levels of ship strikes along the two major

approach routes to Baltimore at the present time. Consequently, the proposed project would not affect any listed whales.

We are requesting your concurrence that the proposed project will have no effect on the listed species including the shortnose sturgeon, whales, sea turtles, or their designated critical habitat. If you have any questions regarding this matter, or require additional information please contact Mrs. Mary Frazier at (410) 962-5679.

Sincerely,

Vance G. Hobbs
Chief, Maryland Section

Enclosure

APPENDIX D – ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

BIOLOGICAL ASSESMENT FOR THE MASONVILLE DREDGED MATERIAL CONTAINMENT FACILITY

BALTIMORE HARBOR, MARYLAND

May 2006

Prepared by: U.S. Army Corps of Engineers, Baltimore District

Section 7(a)(2) of the Endangered Species Act (ESA) (16 U.S.C. 1531 et. seq.) requires every Federal agency, in consultation with and with the assistance of the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), to ensure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. In accordance with Section 7(a)(2), the following information is provided to the NMFS in order to initiate Section 7(a)(2) consultation. This assessment includes:

1. A description of the proposed action;
2. A listing of the species of concern;
3. An analysis of the effects of the proposed action; and,
4. The Federal agency's opinions regarding the effects of the proposed action.

This Section 7 Consultation is the result of an informal consultation with the NMFS by EA Engineering, Science, and Technology (EA) on behalf of the U.S. Army Corps of Engineers (USACE), Baltimore District. The informal consultation letter received by EA from the NMFS is attached.

I. DESCRIPTION OF PROPOSED ACTION

A. Purpose

The purpose of the proposed project is to create a dredged material containment facility (DMCF) to help meet the 20-year Baltimore Harbor dredging need to place 1.5 mcy of dredged material per year. The USACE, Baltimore District, in partnership with the State of Maryland Department of Transportation, Maryland Port Administration (MPA), coordinates the maintenance of the Port of Baltimore's channel system, and continually assesses dredging needs and placement capacity. The Dredged Material Management Act was passed by the Maryland General Assembly in May of 2001 and mandated that placement options to meet the short- and long-term shortfalls in dredged material placement capacity for the Chesapeake Bay Approach Channels and Baltimore Harbor Channels be identified. The MPA created a committee known as the Harbor Team to identify potential dredged material placement sites for material dredged from the Baltimore Harbor. The team recommended three options for consideration: expansion of the

existing Masonville Marine Terminal, construction of a dredged material containment facility (DMCF) adjacent to the former BP Amoco Asphalt Terminal (BP-Fairfield), and construction of a DMCF adjacent to Sparrows Point. These locations are shown in Figure 1. The need to open a placement site for Harbor material by 2009 is driven by the State of Maryland law which requires the Hart-Miller Island (HMI) DMCF to close by December 31, 2009. The proposed Masonville DMCF would meet anticipated shortages in placement capacity beginning with placement of dredged material in 2009 at the site. The proposed Masonville DMCF would not only receive its intended annual placement of 0.5 to 1.0 mcy per year for the first few years, but would likely be overloaded due to the shortage of placement sites for Harbor material, receiving 0.9 to 1.4 mcy per year for the first 5 years of placement in order to meet harbor placement needs.

B. Description of Proposed Action

The proposed Masonville DMCF is located in the middle branch of the Patapsco River, across from South Locust Point near the Baltimore Harbor Tunnel (I-895). This site lies completely within the limits of the City of Baltimore. The Masonville site is bordered by the Patapsco River and Ferry Bar Channel to the north, an industrial site to the south, a habitat protection area to the west and southwest, and the existing MPA property to the east. The property containing the proposed facility alignment and the adjacent habitat protection area are owned by the MPA.

1. Alternatives Considered

Both State and Federal siting investigation/screenings were applied before settling on a proposed action. The processes included both aquatic and upland alternatives. The Federal DMMP considered 35 facility types including upland options such as agricultural application, mine reclamation, and innovative uses, such as making bricks and aggregates. Combinations of options generated 79 alternatives for dredged material placement. After considering all of the environmental, human use and economic issues for each option (per 33 CFR Part 335), the DMMP recommended further study of multiple confined disposal facilities for the Harbor options (USACE 2005).

The State of Maryland has been trying to identify options for dredged material placement since the late 1960s. Hundreds of sites and upland placement options have been considered including the upland options considered by the Federal DMMP. Dredged material placement within the State of Maryland is dictated by several State statutes, including one that restricts the placement of Harbor materials to placement in confined facilities (due to the potential for contamination). Land use studies were among the tools used to identify options around the Harbor for siting of confined facilities or handing sites to meet the placement needs described in Section I.A. After considering all of the potential environmental and human use impacts of potential options, three potential options were proposed for site development (Section I.A).

Because the Masonville site is owned by the State, has no statutory restrictions, and poses a lower potential for environmental and human impacts (relative to the other sites) due to existing contamination and location within the Patapsco River, Masonville was selected as the preferred alternative for this action.

a. Proposed Masonville DMCF Alignment

The proposed Masonville DMCF has a footprint of 141 acres. Of this, 126 acres are open water (River bottom), approximately 1 acre is vegetated wetlands (tidal/non-tidal swales), 10 acres are uplands along the shoreline, 3 acres are existing unauthorized fill (a dry dock), and one acre of fill is anticipated from movement of sunken barges off of the proposed dike line. The proposed alignment includes a channel between the existing Masonville Marine Terminal Phase II and the former Kurt Iron and Metal (KIM) facility and an area known as the Wet Basin adjacent to the Fairfield Marine Terminal. The facility will have an estimated placement capacity of 16 mcy. The containment structure will consist of four sections: an onshore dike, a cofferdam, an armored dike, and a beach. The initial dike height for this project is +10 ft MLLW. The final elevation of the dikes is +36 ft MLLW. Both on-site and off-site material will be used during the construction of the containment structure and unsuitable material within the borrow area will be placed at Hart-Miller Island DMCF. The proposed alignment for the Masonville DMCF is shown in Figure 2.

The proposed action also includes mitigation projects within the adjacent habitat protection area, including tidal wetland creation, reef creation, substrate improvements, beach creation, non-tidal wetland creation, and the development of a bird sanctuary.

b. No Action Alternative

The no action alternative would maintain existing conditions within the study area. The proposed DMCF would not be constructed and the 141-acre footprint would remain unaltered. There would continue to be a critical near-term shortage of dredged material placement capacity for the channels, anchorages, and berthing areas in the Patapsco River. None of the mitigation projects associated with the proposed facility would be realized.

2. Project Area Description

The site includes shoreline, upland, and aquatic or open water areas. Prior to its acquisition by the MPA in 1978, Masonville was used first for mining sand and gravel and then later as a dredged material placement site by Arundel Corporation. In addition to dredged material from Baltimore Harbor, the site was also used for the disposal of building and ship debris, mining tailings, and incinerator waste. After acquiring the property, MPA continued to use the site for dredged material placement through 1989. The Masonville peninsula is comprised of two sections, Phase I and Phase II. Phase I was completed as an automobile terminal in 2000. Final construction of Masonville Phase II began in 2002 to prepare this area for automobile storage. There is an inlet directly east of Masonville that is bordered by the former KIM Company and is part of the current Mercedes facility. The former KIM site was operated as a ship scrapping facility until 1997. Since its purchase, an environmental assessment of the site has been completed, and clean-up efforts are currently underway. The KIM property is included in the Masonville DMCF footprint, and if the DMCF moves forward, the project will include remediation of hazardous materials in 25 sunken and derelict vessels (adjacent to the old KIM site) and capping of the remaining materials within the DMCF.

The northwest shoreline of the site is natural, but littered with debris piles composed of treated timber, rubble, and concrete. Much of the shoreline along the footprint for the proposed alignment is composed of concrete and rubble with a steep, upland berm of vegetation. Along the western shoreline of the site, rubble, concrete, and old pilings make up the majority of the shoreline, with severe erosion occurring along the banks in some areas.

Environmental investigations were conducted within the area from 2003 to 2005, including the following studies: water quality, sediment quality, fisheries and aquatic, benthos, SAV, shallow water habitat, terrestrial vegetation and wetlands, avian and other wildlife. Investigations into avian and wildlife species included studies related to rare, threatened and endangered (RTE) species.

The average depth of the site is approximately 10 ft, with a range of approximately 0 to 40 ft. Most of the site is less than 17 feet deep with one deeper area along the east side that was dredged previously. Average water quality parameters for the site are shown in Table 1. Studies have indicated that the substrate within the footprint of the proposed Masonville DMCF is predominately silts and clay, which is consistent with the Patapsco River as a whole. The footprint of the proposed facility includes 130 acres of open water habitat and River bottom. A small amount of SAV (0.38 acres) occurs within the proposed alignment with a total of 10 acres of Tier I/Tier II SAV (shallow water habitat, < 6.5 feet) occurring within the footprint of the proposed DMCF.

Table 1. Average Seasonal Water Quality Parameters Measured At Masonville Sampling Locations between 2003 and 2005

		Spring	**Summer**	**Fall**
Temperature (^{o}C)	Surface	24.4	26.3	18.2
	Mid	23.4	26.1	19.1
	Bottom	22.7	24.9	19.9
pH	Surface	8.3	8.3	6.1
	Mid	8.1	8.1	6.2
	Bottom	7.7	7.8	7.5
Dissolved Oxygen (mg/L)	Surface	9.4	9.6	8.1
	Mid	8.2	7.9	7.8
	Bottom	6.7	5.1	7.4
Salinity (ppt)	Surface	4.8	4.6	9.0
	Mid	5.3	4.9	7.4
	Bottom	5.5	5.8	4.0
Turbidity (NTU)	Surface	5.7	16.4	2.9
	Mid	6.7	14.7	4.5
	Bottom	9.2	10.9	5.5

II. SPECIES OF CONCERN

Based on the informal consultation letter from NMFS dated October 11, 2005, the following threatened and endangered species are a concern in the Patapsco River and proposed Masonville DMCF area,

- Shortnose Sturgeon (*Acipenser brevirostrum*)
- Kemp's ridleys (*Lepidochelys kempii*)
- Leatherback (*Dermochelys coriacea*)
- Loggerhead (*Caretta caretta*)
- Green sea turtle (*Chelonia mydas*)

The NMFS also noted that Atlantic Sturgeon (*Acipenser oxyrhynchus)* is being considered for listing as a Rare, Threatened or Endangered species although it is not yet a candidate species. Based upon Reward Program collections (described in Section II.A), wild Atlantic Sturgeon predominantly occur in the Mid- and southern reaches of the Chesapeake Bay. As of March 1, 2006, 979 wild Atlantic sturgeon have been captured in the USFWS reward program. Of these, 95 percent were collected south of the Bay Bridge, which is a minimum of 27 miles from the Masonville site. As of March 1, 2006, 53 wild Atlantic sturgeon were collected north of the Bay Bridge. The closest collections relative to Masonville were 2 specimens in gillnets and 1 in a pound net set at the mouth of the Patapsco River, approximately 8.5 miles from Masonville.

In a more recent letter from NMFS (dated March 23, 2006) the concern for impacts to listed whale species resulting from increased ship traffic to and from the Port of Baltimore associated with the Masonville DMCF was also raised as a potential concern. As a result, the following list of whale species has also been added to this assessment:

- Northern right whale (*Eubalaena glacialis*)
- Humpback whale (*Megaptera novaeangliae*)
- Fin whale (*Balaenoptera physalus*)
- Sei whale (*Balaenoptera borealis*)
- Blue whale (*Balaenoptera musculus*)
- Sperm whale (*Physeter macrocephalus*)

A. Shortnose Sturgeon

Shortnose Sturgeon (SNS) have been documented in the Chesapeake Bay since the 1600s, when settlers first colonized America. Historical records indicate that SNS were commonly found to inhabit the Potomac River in Maryland in the 1800s (Uhler and Lugger 1876). Until recently, few SNS had been reported in the Chesapeake Bay and the last known resident populations were considered extirpated in the 1970s (Dadswell et al. 1984). There is, however, a documented resident population in the Delaware River (Hastings et al. 1987). When SNS were found in the Bay over the last 20 years, it was generally believed that they were infrequent transients, non-resident adults that had traveled through the Inland Waterway, Chesapeake & Delaware (C&D) Canal, from the Delaware Bay into the Chesapeake Bay. Spawning occurs in upper, freshwater areas, while feeding and over wintering activities may occur in both fresh and saltwater habitats. Suitable and/or critical habitat for SNS in the Chesapeake Bay is currently unknown, due to their infrequent detection in the Bay. Spawning habitat has not been identified in the Chesapeake

Bay. Prior to 1998, no juveniles or spawning activity had been observed in the Chesapeake Bay for decades, leading to the assumption that a distinct population segment, or resident population, did not exist in the Chesapeake Bay. Speculation has been that overfishing, loss of habitat, and spawning impediments such as the Conowingo Dam have contributed to their decline or extirpation. At present, the continued existence of a distinct SNS population in the Chesapeake Bay remains uncertain. However, genetic assessments of the SNS captured from the Reward Program in the Chesapeake Bay have indicated that the Chesapeake Bay specimens analyzed are genetically similar to the Delaware River population that is currently stable (Wirgin et al. 2002).

SNS usually occur in the Chesapeake Bay at depths between 3.3 and 39.4 ft (1 and 12 m) (Kieffer and Kynard 1993, Savoy and Shake 2000, Welsh et al. 2000) although captures have been made at depths up to 60 ft. Due to the stress caused by high temperatures of summer surface waters SNS seek deep, cooler waters during warm seasons.

The NMFS has been reviewing SNS catches in the Chesapeake Bay as a result of the USFWS Reward Program that was initiated in 1996. This program has resulted in the reporting and documentation of SNS as incidental bycatch in gillnets, pound nets, catfish traps, fyke nets, hoop nets, and eel traps of watermen in the Chesapeake Bay. Recent SNS data provided by the USFWS from the reward program have indicated that 71 SNS have been captured, but no SNS have been captured within the proposed alignment of the proposed Masonville DMCF through March 1, 2006. Only five specimens have been collected in the Patapsco River, the locations of which are depicted in Figure 3. The closest SNS capture was approximately 8.5 miles east of the project site in the mouth of the Patapsco River.

Of the 71 SNS captured from 1996 to 2006 as part of the Reward Program, nine were captured in the Susquehanna River and two were captured from the Susquehanna Flats; SNS have also been captured in upper Bay tributaries: two in the Bohemia River, two in the Sassafras River, and one in the Elk River. In addition, 36 SNS captures were made north of the Bay Bridge, and the remaining 19 SNS were captured south of the Bay Bridge in the vicinity of Kent Island, Holland Point (near Herring Bay), north of Barren Island, Fishing Bay (near the Nanticoke River), and the Potomac River (8 SNS captures). It is important to note that all SNS captures north of the Bay Bridge (latitude 39˚00’00’’) occurred in December through June. This may be an affect of spring freshwater discharge and the associated depression of salinity with distance down the Bay with SNS preference for lower salinity waters.

Length data from the Reward Program captures indicate that the largest SNS were generally captured in the middle Chesapeake Bay around the Potomac River mouth through the Barren Island area. ‘Possible juveniles’ have all been captured in the upper Chesapeake Bay.

The majority of the SNS found in the Chesapeake Bay through the USFWS Reward Program have been captured in relatively shallow water [<25 ft (<7.6 m)], consistent with the gear type of the commercial watermen (primarily gillnets and pound nets). This is also consistent with some studies which have found that sturgeon tend to stay in the top 6.6 ft (2 m) of the water column when traveling, and come into shallow waters to feed (Moser and Ross 1993). While it is probable that the gear type in which the SNS were captured influences both the location and depth of the recorded capture locations in the USFWS Reward Program data, it can be deduced

from this information that sturgeon are using waters of 4 to 60 ft (1.2 to 18.3 m) in at least the months of December through June each year. SNS are known to overwinter in deep, channel sections of rivers (NMFS 1999a). Thus, it is probable that the Howell Point to Grove Point section of the upper Chesapeake Bay provides overwintering habitat for SNS due to the water depth. The extent to which SNS use the shipping channel in this region is unknown. Four of the SNS were captured in the general vicinity of the southern approach channels to the C&D Canal and one was captured near the Tolchester Channel. However, many more have been captured in shallower waters. In consultation with the NMFS, using funding provided by the USACE, the USFWS conducted a study from December 1997 through June 2000 to determine the distribution of SNS in the upper Chesapeake Bay. The USFWS deployed nets in the shipping channels in the upper Bay and some of the proposed dredged material placement sites in the upper Bay. No SNS were caught in any of the shipping channels.

No SNS were captured in the waters immediately surrounding the proposed Masonville DMCF site in the Reward Program as of March 1, 2006. Reconnaissance and State feasibility-level fisheries surveys were conducted in the project area from 2003 to 2005. A total of 28 species were collected by trawl, seine or gillnet. No SNS were observed during these surveys.

B. Sea Turtles

Of the four sea turtle species found in Chesapeake Bay, loggerheads and Kemp's ridleys are the most common and are most likely to be found in the Chesapeake Bay. Leatherbacks typically continue past the Chesapeake Bay, while loggerheads and Kemp's ridleys will enter the Bay once water temperatures reach 18 to 20˚C (64.4 to 68 ˚F) (Lutcavage and Musick 1985, Byles 1988, CBP 2005). Loggerheads and Kemp's ridleys in-migrate into Chesapeake Bay in late May or early June once water temperatures warm and out-migrate in September and October (Lutcavage and Musick 1985, Byles 1988, Keinath et al. 1994). Loggerheads account for nearly 90 percent of the summer sea turtle population in the Chesapeake Bay (CBP 2005). The greatest threats to sea turtles in the Chesapeake Bay are injury and death from boat propellers, accidental capture in pound nets, and ingestion of plastic refuse.

Sea turtles generally nest on high-energy sand beaches along the eastern seaboard, south of the State of Maryland. No nesting is known to occur within the Chesapeake Bay (Evans et al. 1997).

The Chesapeake Bay is an important developmental and foraging habitat for sea turtles in the summer months. After over-wintering in southern waters, sea turtles migrate north along the Atlantic coast to feed during the summer months. Loggerheads feed mostly on shellfish such as horseshoe crabs, clams, mussels, and other invertebrates. Kemp's ridleys prefer horseshoe crabs, but will consume other crustaceans, sea grasses, sponges, fish, mollusks, and snails. Loggerheads typically use channel edges (mean water depth of 9.4 m) whereas ridleys occupy shallower areas (mean water depth of 4.6 m) (Byles 1988). Kemp's ridleys distribution may be closely related to the location of seagrass beds where they can find a plentiful supply of crustaceans (Lutcavage and Musick 1985). Leatherbacks have been reported in the upper Bay (Hardy 1969 cited by Byles 1988*)* but are most frequently found in the lower Bay, at the mouth of the Bay. Leatherbacks are most likely drawn to the mouth to feed on jellyfish, the main constituent of their diet (Keinath et al. 1987). Young green turtles feed on worms, young

crustaceans, aquatic insects, grasses and algae, but become strictly herbivorous as adults. Green turtles were historically recorded in the Chesapeake, but are now rarely found (Keinath et al. 1987), although one was captured in 2002 in Virginia waters during exclusion trawling prior to dredging near Cape Henry, VA.

There are two sources of information on the current presence of sea turtles in Maryland waters of the Chesapeake Bay: the Marine Mammal and Sea Turtle Stranding Program, 1990 through present, and the Sea Turtle Tagging and Health Assessment Study, operated from 2001 through 2003.

The Marine Mammal and Sea Turtle Stranding Program was established by the Maryland Department of Natural Resources (MDNR) at the Cooperative Oxford Laboratory (COL) in the fall of 1990. The network is responsible for the retrieval and examination of all dead stranded marine mammals and sea turtles in Maryland. The stranding network collects species identification, stranding location, and life history (morphometric) data in addition to investigating causes of death, and assessing human interaction from boat strikes, fisheries interactions, and entanglement or ingestion of marine debris.

308 dead stranded sea turtles were reported in Maryland between 1991 and 2003 (Kimmel 2004). Of the 308 reported, 123 were found in the Chesapeake Bay (Figure 4). The remaining 185 were reported from the Maryland portion of the Atlantic Coast and the coastal bays. Strandings of all four federally listed species (leatherback, loggerhead, Kemp's ridley, and green).have been reported. Strandings have occurred throughout the Maryland waters of the Chesapeake Bay from Tangier Sound to the mouth of Back River (Figure 4), but strandings were most heavily concentrated in Calvert and Saint Mary's counties along the western shore. Table 2 contains the Chesapeake Bay strandings by year and species. Focusing only on the Chesapeake Bay strandings, loggerhead accounted for 91 percent of all stranding (n=112 turtles). Of the remaining strandings, 6 percent were leatherback (n=6), 3 percent were Kemp's ridley (n=3), and less than 1 percent (n=1) were unknown. No green sea turtles have been reported in Chesapeake Bay (Kimmel 2004), although one was found along the Maryland Atlantic Coast in 2000. Monthly strandings data characterizes sea turtle use of the Chesapeake Bay during warm months. Sea turtle strandings occurred from May to November, though there were two strandings recorded in January (Table 3). The highest concentration of strandings was in June (81 strandings), followed by July. The closest sea turtle stranding was in the Back River, approximately 10 miles from Masonville.

Table 2. Sea Turtle Strandings in Maryland Waters of the Chesapeake Bay, 1991-2003 (Reproduced from Kimmel 2004)

Species	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**TOTAL**
Loggerhead	4	5	12	6	17	14	7	19	3	8	7	5	5	**112**
Leatherback	-	1	-	-	3	-	1	-	-	1	-	-	1	**7**
Kemp's ridley	1	-	-	-	-	-	-	-	-	1	-	-	1	**3**
Green	-	-	-	-	-	-	-	-	-	-	-	-	-	**0**
Unknown	-	-	-	-	-	-	-	-	-	-	1	-	-	**1**
TOTAL	5	6	12	6	20	14	8	19	3	10	8	5	7	**123**

Table 3. Monthly distribution of sea turtle captures by species in Maryland's Chesapeake Bay (Kimmel pers. comm. with USACE 2005)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Leatherback	0	0	0	0	0	3	2	0	1	0	0	0
Kemp's Ridley	1	0	0	0	1	3	0	0	0	0	0	0
Loggerhead	1	0	0	0	5	74	14	7	6	6	2	0
Green	0	0	0	0	0	0	0	0	0	0	0	0
unknown	0	0	0	0	0	1	1	0	0	0	0	0
TOTAL	**2**	**0**	**0**	**0**	**6**	**81**	**17**	**7**	**7**	**6**	**2**	**0**

A second source of knowledge about sea turtle presence in Chesapeake Bay is available from the "Sea Turtle Health Assessment and Tagging Study" initiated in September 2000 by MDNR's COL. This study established a cooperative agreement with pound net fishermen in Maryland to obtain information such as weight, size, and blood samples from incidentally captured sea turtles. Two commercial watermen participated in 2001 and reported 7 turtles. Three commercial watermen participated in 2002, resulting in a report of 12 turtles. In 2003, participation increased to five pound netters and the reporting of 23 incidentally captured sea turtles. Table 4 identifies the location and identification of the 23 sea turtles captured in 2003. These locations are mapped in Figure 4. Figure 5 identifies the location of participating pound nets from 2001 through 2003. The closest net site to Masonville is located approximately 28 miles from the site at the southern end of Kent Island.

Table 4. Distribution of incidental captures of sea turtles among 2003 net sites. Numbers in parentheses indicate recaptures (Reproduced from Kimmel 2004)

Net Site	# of nets	Loggerhead	Kemp's ridley	Total
NW of Hoopers Island	3	8 (1)	5 (1)	13 (2)
Pocomoke Sound	1	2	--	2
Fishing Bay	1	--	1	1
Choptank River	1	1	1	2
Kent Island	2	2 (1)	--	2 (1)
Totals	**8**	**13 (2)**	**7 (1)**	**20 (3)**

Incidental takes occurred between May and September in 2001, 2002, and 2003 with the greatest number of captures occurring in June and July. Captures were concentrated northwest of Hooper's Island and near the mouth of Fishing Bay due to a higher reporting of incidental captures by watermen in those areas. Although, the spatial distribution of turtle captures cannot conclusively characterize sea turtle use in Chesapeake Bay, it does positively identify areas definitively used by sea turtles.

The incidental take study has examined a total of 42 sea turtles since the summer of 2001, of which 3 were recaptures. As reported by Kimmel (2004), seventeen of the remaining 39 turtles

were Kemp's ridleys and 22 were loggerheads. Kemp's ridleys were typically 30 to 40 cm subadults.

Recaptured individuals provide insight on the use of Chesapeake Bay waters by sea turtles and demonstrate the diversity of sea turtle movements. A Maryland loggerhead sea turtle captured in a pound net near Kent Island in July 2001 was recaptured in the same pound net on September 15, 2003 indicating site fidelity by a subadult loggerhead over multiple, although not necessarily consecutive years (Kimmel 2004). A Kemp's ridley tagged in the mouth of the Choptank River on June 21, 2003 was recaptured a week later about 10 miles from the initial capture location in a pound net northwest of Hoopers Island. A loggerhead found in one of the three pound nets northwest of Hoopers Island was recaptured in a different net in the same general location several days after the original capture. These two recaptures suggest restricted turtle movements within the Bay during the summer (Kimmel 2004). Conversely, two captures in waters outside the Chesapeake Bay demonstrate migrations of greater distance. A loggerhead, was tagged on May 23, 2002 and recaptured in a pound net in Virginia waters of the Potomac River on August 15, 2002. A fifth turtle (a loggerhead) was incidentally captured near Hoopers Island in 2001; the University of Central Florida had originally tagged it on July 23, 1992, on Melbourne Beach, Brevard County, Florida (a distance of roughly 1500 km away) (Kimmel 2004).

The 2004 and 2005 Marine Animal Rescue Program (MARP) at thee National Aquarium in Baltimore (NAIB) records indicate that there were five sea turtle strandings in or near the Chesapeake Bay. There were two dead and one live (later euthanized by the NAIB veterinarian) loggerhead sea turtles and one dead leatherback sea turtle found dead near Ocean City and Assateague Island. There was one loggerhead sea turtle found washed up near Calvert Cliffs in Calvert County, Maryland in 2004. All of the 2004 and 2005 sea turtles were found during June and July.

No sea turtles have been reported in the Patapsco River or Baltimore Harbor since late 1990 (when the standing program began) and there are no known records of sea turtles in the Patapsco River prior to that time. There have been sea turtles reported in the Magothy River and the Back River, which are the rivers north and south of the Patapsco River (Kimmel 2005).

C. Whales

Though whales are only rarely found in the Chesapeake Bay, there are six listed whale species in the region: the northern right whale (*Eubalaena glacialis*), the humpback whale (*Megaptera novaeangliae*), the fin whale (*Balaenoptera physalus*), the sei whale (*Balaenoptera borealis*), the blue whale (*Balaenoptera musculus*); and sperm whale (*Physeter macrocephalus)*

Right Whale

Right whales were one of the first large whales to be hunted on a systematic, commercial basis (Clapham et al. 1999). Records indicate that commercial whaling of right whales in the North Atlantic may have begun as early as 1059 (Aguilar 1986). Commercial whaling for right whales along the U.S. Atlantic coast peaked in the 18th century, but right whales continued to be taken opportunistically along the coast and in other areas of the North Atlantic into the early 20th century (Kenney 2002). Right whales have occurred historically in all the world's oceans from temperate to subarctic latitudes (Perry et al. 1999). In both hemispheres, they are observed at low latitudes and in nearshore waters where calving takes place in the winter months, and in higher latitude foraging grounds in the summer (Clapham et al. 1999; Perry et al. 1999).

In 2000, the International Whaling Commission (IWC) reviewed the taxonomic nomenclature of right whales. Based on the results of genetic studies, the IWC formally recognized North Pacific, North Atlantic, and southern hemisphere right whales as three separate species (Best et al. 2001). In April 2003, NMFS published a final rule in the Federal Register (68 FR 17560) that amended the ESA-listing for right whales by recognizing three separate species: North Atlantic right whale (*Eubalaena glacialis*), North Pacific right whale (*Eubalaena japonica*), and southern right whale (*Eubalaena australis*). However, on January 11, 2005, another final rule was published (70 FR 1830) that removed the April 2003 final rule on the grounds that it was procedurally and substantively flawed. As a result, the ESA-listing for right whales has reverted to that in effect prior to the April 2003 rule; all right whales are listed as endangered either as Northern right whales (*Eubalaena glacialis*) or Southern right whales (*Eubalaena australis*).

There are five key habitat areas for the right whale, including three areas designated as critical habitat by NMFS (in accordance with the Endangered Species Act (ESA)) within U.S. waters of the Atlantic Ocean. None of these critical or key habitat areas include the Chesapeake Bay or adjacent waters. The closest key habitat area lies to the north near Cape Cod; the closest key habitat to the south is along the Georgia coastline. Though right whales move through mid-Atlantic waters regularly, areas north of Georgia and south of Cape Cod are not considered to be a high use areas for right whales (NMFS 2003). Calving occurs primarily in the waters along the Florida and Georgia coast, though some mother-calf pairs of whales use coastal waters of North Carolina and South Carolina as wintering and calving areas (NMFS 2003). The areas in Cape Cod Bay and east of Cape Cod were designated as critical habitat for their importance as foraging sites (NMFS 1994). NMFS received a petition to increase the critical habitat in 2002 based on new distribution information. The ESA requires that critical habitat be identified based on specific habitat features, not distribution information, and additional analyses of the sightings and their environmental correlations would be necessary to designate these areas as critical habitat (NMFS 2003).

Unknowns about right whale habitat persist. For example, some female right whales have never been observed in the Georgia and Florida calving grounds but have been observed with a calf on the summer foraging grounds (Best et al. 2001). It is unknown whether these females are calving in an unidentified calving area or have just been missed during surveys off of Florida and Georgia (Best et al. 2001). The absence of some known (photo-identified) whales from identified habitats for months or years at a time suggests the presence of an unknown feeding ground

(Kenney 2002). Finally, while behavior suggestive of mating is frequently observed on the foraging grounds, conception is not likely to occur at that time given the known length of gestation in other baleen whales. More likely, mating and conception occur in the winter (Kenney 2002). Based on genetic data, it has been suggested that two mating areas may exist with a somewhat different population composition (Best et al. 2001). The location of the mating area(s) is unknown.

There are relatively few right whales remaining in the western North Atlantic, although the exact number is unknown. As is the case with most wild animals, an exact count cannot be obtained. However, abundance can be reasonably estimated as a result of the extensive study of this subpopulation. IWC participants from a 1999 workshop agreed that it was reasonable to state that the number of western North Atlantic right whales as of 1998 was probably around 300 (+/- 10 percent) (Best et al. 2001).

A total of 125 right whale calves has been observed since the 1999 workshop, including a record calving season in 2000/2001 with 31 right whale births (B. Pike, New England Aquarium, pers. comm.). Calving numbers have been sporadic, with large differences among years. The three calving years (1997-2000) prior to the record year in 2000/2001 provided low recruitment with only 10 calves born, while the last five calving seasons (2000-2005) have been remarkably better with 31, 21, 19, 16, and 28 births, respectively. The calf count of 28 animals for the latest calving season (2004/2005) is still preliminary and additional calves may be observed on the summer foraging grounds (B. Zoodsma, SERO, pers. comm.). However, the subpopulation has also continued to experience losses of calves, juveniles and adults. As of December 1, 2004, there were 459 individually identified right whales in the photo-identification catalog of which 18 were known to be dead, and 330 had been sighted during the previous six years (B. Pike pers. comm.).

Data collected in the 1990s suggested that right whales were experiencing a slow but steady recovery (Knowlton et al. 1994). However, Caswell et al. (1999) used photo-identification data and modeling to estimate survival and concluded that right whale survival decreased from 1980 to 1994. Modified versions of the Caswell et al. (1999) model as well as several other models were reviewed at the 1999 IWC workshop (Best et al. 2001). Despite differences in approach, all of the models indicated a decline in right whale survival in the 1990s relative to the 1980s with female survival, in particular, affected (Best et al. 2001; Waring et al. 2002). In 2002, NMFS' North East Fisheries Science Center (NEFSC) hosted a workshop to review right whale population models to examine: (1) potential bias in the models and (2) changes in the subpopulation trend based on new information collected in the late 1990s (Clapham et al. 2002). Three different models were used to explore right whale survivability and to address potential sources of bias. Although biases were identified that could negatively affect the results, all three modeling techniques resulted in the same conclusion; survival, particularly of females, has continued to decline (Clapham et al. 2002).

There are four sources of information on the presence of marine mammals in the Maryland waters of the Chesapeake Bay: the MARP operated out of the NAIB, the Marine Mammal and Sea Turtle Stranding Program established by the Maryland DNR at the Cooperative Oxford

Laboratory (COL), the NOAA marine mammal stranding database, and NOAA large whale ship strike database. According to the databases listed above, six right whales have been stranded or found dead (floating) in Maryland or Virginia waters since 1990. All six whales were found from 2001 to 2005 in moderate to advanced stages of decomposition. Only one of these whales was found in Maryland waters and this whale was found off the coast of Ocean City, Maryland within the Atlantic Ocean. These records also indicate that four right whales, including one calf, have been found dead that were potentially the result of a ship strike in Virginia or Delaware waters since 1904. These whales were found in March 2001, December 1993 (two different events, both female), and July 1991. The calf was found dead in July 1991.

A study of human-caused mortality and serious injury determinations for northwest Atlantic Ocean large whale stocks from 1999 to 2003 indicates no human-caused serious injuries to or mortalities of the right whale in the Chesapeake Bay. The closest mortalities were near Assateague, Virginia and Ocean City, Maryland. No serious injuries to right whales occurred from 1999 to 2003 in waters near Maryland or Virginia (Cole et. al. 2005).

Fifteen right whales have been sighted and reported to NOAA in Delaware, Maryland and Virginia waters since 1998. Most were found in the vicinity of Norfolk, Virginia. Most of the right whale sightings noted on the NOAA website were in waters off the coast of New England and Canada (NOAA 2006c).

Humpback Whale

Humpback whales inhabit all major ocean basins from the equator to subpolar latitudes. They generally follow a predictable migratory pattern in both hemispheres, feeding during the summer in the higher latitudes (40 to 70 degrees latitude) and migrating to lower latitudes (10 to 30 degrees latitude) where calving and breeding take place in the winter (Perry et al. 1999, NMFS 2006). During the spring, summer, and fall, humpback whales in the North Atlantic Ocean feed over a range that includes the eastern coast of the U.S., the Gulf of St. Lawrence, Newfoundland/Labrador, and western Greenland. Prior to commercial whaling, the global population of humpback whales was thought to be over 125,000. Currently, the global population is thought to be under 7,000 whales (NMFS 2006).

In winter, whales from the six feeding areas mate and calve primarily in the West Indies where spatial and genetic mixing among these groups occur (Waring et al. 2000). Various papers (Clapham and Mayo 1990; Clapham 1992; Barlow and Clapham 1997; Clapham et al. 1999) summarized information gathered from a catalogue of photographs of 643 individuals from the western North Atlantic population of humpback whales (also referred to as the Gulf of Maine stock). These photographs identified reproductively mature western North Atlantic humpbacks wintering in tropical breeding grounds in the Antilles, primarily on Silver and Navidad Banks, north of the Dominican Republic. The primary winter range also includes the Virgin Islands and Puerto Rico (NMFS 1991a). Not all whales migrate to the West Indies every year and some are found in the mid- and high-latitude regions during the winter months. Increased numbers of humpback whales, specifically juveniles, have been spotted in the Chesapeake and Delaware Bays and along the Virginia and North Carolina coasts.

Humpback whales use the Mid-Atlantic as a migratory pathway to and from the calving/mating grounds, but it may also be an important winter feeding area for juveniles. Since 1989, observations of juvenile humpbacks in the Mid-Atlantic have been increasing during the winter months, peaking from January through March (Swingle et al. 1993). Biologists theorize that non-reproductive animals may be establishing a winter feeding range in the Mid-Atlantic since they are not participating in reproductive behavior in the Caribbean. Swingle et al. (1993) identified a shift in distribution of juvenile humpback whales in the nearshore waters of Virginia, primarily in winter months. Identified whales using the Mid-Atlantic area were found to be residents of the Gulf of Maine and Atlantic Canada (Gulf of St. Lawrence and Newfoundland) feeding groups, suggesting a mixing of different feeding populations in the Mid-Atlantic region. Strandings of humpback whales have increased between New Jersey and Florida since 1985 consistent with the increase in Mid-Atlantic whale sightings. No critical habitat has been designated for the humpback whale (NMFS 2006). Strandings were most frequent during September through April in North Carolina and Virginia waters, and were composed primarily of juvenile humpback whales of no more than 11 meters in length (Wiley et al. 1995).

There are four sources of information on the presence of marine mammals in the Maryland waters of the Chesapeake Bay: the MARP operated out of the NAIB, the Marine Mammal and Sea Turtle Stranding Program established by the Maryland DNR at the COL, the NOAA marine mammal stranding database, and NOAA large whale ship strike database. According to the four databases listed above, 22 humpback whales have been found dead (strandings or floating) in Maryland and Virginia waters since 1990. The closest mortality to the Baltimore Harbor occurred at Gwynn's Island in the Chesapeake Bay approximately 100 nautical miles south of the Harbor (NOAA Database 2006). An additional seven dead humpback whales have been found since 1904 in Maryland, Delaware, and Virginia waters that may have been the result of ship strikes. These individuals were found in February 2002, May 1996, April 1996, June 1995, October 1992, April 1992, and February 1992 (Jensen et al. 2004).

A study of human-caused mortality and serious injury determinations for northwest Atlantic Ocean large whale stocks from 1999 to 2003 indicates no human-caused serious injuries to humpback whales in the Chesapeake Bay. The closest mortality of a humpback whale was at the mouth of the Chesapeake Bay in Virginia and was the result of a ship strike. Three other humpback whale mortalities related to ship strikes or entanglement in fishing gear in Virginia waters were reported during the study period. One serious injury to a humpback whale as a result of entanglement in fishing gear occurred near Ocean City, Maryland (Cole et al. 2005).

There is some evidence that humpback whales occasionally utilize the Chesapeake Bay. Several humpback whales were seen feeding under the Chesapeake Bay Bridge (in Maryland) in 1992 (Kimmel 2006). This is approximately 27 miles south of Masonville and is the northern-most record of live large whales in the Bay.

Fin Whales

Fin whales inhabit a wide range of latitudes between 20 to 75° N and 20 to 75° S (Perry *et al.* 1999). The fin whale is ubiquitous in the North Atlantic and occurs from the Gulf of Mexico and Mediterranean Sea northward to the edges of the arctic ice pack (NMFS 1998a). The overall

pattern of fin whale movement is complex, consisting of a less obvious north-south pattern migration than that of right and humpback whales.

NMFS has designated one population of fin whale in U.S. waters of the North Atlantic (Waring *et al.* 1998). This species is commonly found from Cape Hatteras northward. A number of researchers have suggested the existence of fin whale subpopulations in the North Atlantic based on local depletions resulting from commercial overharvesting (Mizroch and York 1984) or genetics data (Bérubé *et al.* 1998). Photoidentification studies in western North Atlantic feeding areas, particularly in Massachusetts Bay, have shown a high rate of annual return by fin whales, both within years and between years (Seipt *et al.* 1990) suggesting some level of site fidelity. In 1976, the IWC's Scientific Committee proposed seven stocks (or populations) for North Atlantic fin whales. These are: (1) North Norway, (2) West Norway-Faroe Islands, (3) British Isles-Spain and Portugal, (4) East Greenland-Iceland, (5) West Greenland, (6) Newfoundland-Labrador, and (7) Nova Scotia (Perry *et al.* 1999). However, it is uncertain whether these boundaries define biologically isolated units (Waring *et al.* 1999).

The single most important area for the Western North Atlantic stock appears to be from the Great South Channel, along the 50m isobath past Cape Cod, over Stellwagen Bank, and past Cape Ann to Jeffrey's Ledge (Hain *et al.*1992).

Like right and humpback whales, fin whales are believed to use North Atlantic waters, particularly in the vicinity of New England, primarily for feeding, and more southern waters for calving. However, evidence regarding where the majority of fin whales winter, calve, and mate is still scarce. Clark (1995) reported a general pattern of fin whale movements in the fall from the Labrador/Newfoundland region, south past Bermuda and into the West Indies, but neonate strandings along the U.S. Mid-Atlantic coast from October through January suggest the possibility of an offshore calving area (Hain *et al.* 1992).

There are four sources of information on the presence of marine mammals in the Maryland waters of the Chesapeake Bay: the MARP operated out of the NAIB, the Marine Mammal and Sea Turtle Stranding Program established by the Maryland DNR at the COL, the NOAA marine mammal stranding database, and NOAA large whale ship strike database. According to the four databases listed above, four fin whales have been found dead in Maryland and Virginia waters since 1990. These whales were found in April 1997 (male), February 1999 (male), and March 2005 (female). All four were in moderate states of decomposition (NOAA Database 2006). There have also been ten confirmed or possible ship strikes of fin whales in Maryland and Virginia waters since 1904. All ten involved mortality. Three of these fin whale mortalities were discovered in Baltimore, Maryland; it is likely that these whales were brought in on ships entering the Port of Baltimore.. On April 18, 1979 a dead fin whale was brought into port on the bow of a Russian Cruise ship. On March 7, 1984, a fin whale was brought into port on the bow of a ship. There was bruising evident on the whale. On November 25, 1990, a dead fin whale was found in Curtis Bay. The whale was reportedly killed shortly before being found and had a ship strike mark on its left side (Jensen et al. 2004).

A study of human-caused mortality and serious injury determinations for northwest Atlantic Ocean large whale stocks from 1999 to 2003 indicated no human-caused serious injuries to or mortalities of fin whales in the Chesapeake Bay during that period (Cole et al. 2005). The

closest human-caused mortality of a fin whale was near Virginia Beach, Virginia and was the result of a ship strike.

Sei Whales

Sei whales are widely distributed around the globe and occur both in the tropics and cold waters. Their range extends from the Antarctic to the North Atlantic in the vicinity of Iceland, though they are more commonly found in temperate waters. Migratory patterns and other life cycle movements are not well understood. Regional distribution of this species is linked to concentrations of prey species; episodic influxes to areas where they had been rare to exploit a food source are common. Breeding grounds are assumed to be in warmer water, but little information on breeding grounds and mating habits of sei whales is known. Populations are currently more abundant in the northern hemisphere than the southern hemisphere (American Cetacean Society 2006, Whale Center of New England 2006).

This species reaches sexual maturity around age ten and has a gestation period of approximately one year. Calving takes place up to once every two years (American Cetacean Society 2006). Breeding habits are largely unknown; mating may occur year round. Sei whales are generally solitary or in small groups of two or three whales.

From 1959 to 1971 over 10,000 sei whales were killed in the Antarctic. This caused a population crash, which led to the protection of the species. Current populations indicate that the global population of sei whales is one fifth of its historic size.

There are four sources of information on the presence of marine mammals in the Maryland waters of the Chesapeake Bay: the MARP operated out of the NAIB, the Marine Mammal and Sea Turtle Stranding Program established by the Maryland DNR at the COL, the NOAA marine mammal stranding database, and NOAA large whale ship strike database. According to these four databases, two sei whales have been found dead (strandings or floating) in Maryland and Virginia waters since 1990. It was a male found in a moderate state of decomposition in February 2003 (NOAA Database 2006). The other was found floating in February 2005. Records indicate that there were two additional dead sei whales associated with ship strikes. A sei whale was brought into the Baltimore area on the bulbous bow of a ship in May 13,1988 with a damaged skull (Jensen et al. 2004). Another sei whale was brought into the Baltimore Harbor on April 18, 2006 on the bulbous bow of a 800-ft cargo ship. Early indications are that the 2006 sei whale was struck in the open ocean and carried up the Bay from the Atlantic Ocean.

A study of human-caused mortality and serious injury determinations for northwest Atlantic Ocean large whale stocks from 1999 to 2003 indicates that only one sei whale mortality in the Chesapeake Bay was a result of human-caused serious injuries (Cole et al. 2005). This occurred near Norfolk, Virginia and was the result of a ship strike. This incident occurred February 19, 2003. The time frame of this study excludes the two sei whale mortalities as a result of ship strikes mentioned in above.

Sperm Whales

Sperm whales (*Physeter macrocephalus*) are the largest of the odontocetes (toothed whales). They are ubiquitous in the world oceans. They can be seen close to the edge of pack ice in both hemispheres and are also common along the equator, especially in the Pacific. Sperm whales are found throughout the world's oceans in deep waters between about 60 degrees north and 60 degrees south latitudes. Their distribution is dependent on their food source and suitable conditions for breeding, and varies with the sex and age composition of the group. Sperm whale migrations are not as predictable or well understood as migrations of most baleen whales. In some mid-latitudes, there seems to be a general trend to migrate north and south depending on the seasons (whales move poleward in the summer). However, in tropical and temperate areas, there appears to be no obvious seasonal migration.

Sperm whales tend to inhabit areas with a water depth of 600 meters or more, and are uncommon in waters less than 300 meters deep. Female sperm whales are generally found in deep waters (at least 1000 m) at low latitudes (less than 40 degrees, except in the North Pacific where they are found as high as 50 degrees). These conditions generally correspond to sea surface temperatures greater than 15°C, and while female sperm whales are sometimes seen near oceanic islands, they are typically far from land. There are no records of this species utilizing the Chesapeake Bay.

Immature males will stay with female sperm whales in tropical and subtropical waters until they begin to slowly migrate towards the poles, anywhere between ages 4 and 21 years old. Older, larger males are generally found near the edge of pack ice in both hemispheres. On occasion, however, these males will return to the warm water breeding area.

NMFS has not designated critical habitat for this species. For management purposes, NMFS has divided the sperm whales inhabiting U.S. waters into five stocks. The North Atlantic Stock is the group found offshore of the Maryland-Delaware-Virginia coast. The best available abundance estimate for sperm whales in the U.S. North Atlantic is 4,702, which is the sum of two estimates from U.S. Atlantic surveys in 1998. In winter, individuals from this stock are concentrated east and northeast of Cape Hatteras. In spring, the center of distribution shifts northward to east of Delaware and Virginia, and is widespread throughout the central portion of the mid-Atlantic bight and the southern portion of Georges Bank. In summer, the distribution is similar but also includes the areas east and north of Georges Bank and into the Northeast Channel region, as well as the continental shelf (inshore of the 100 m isobath) south of New England. In the fall, sperm whale occurrence south of New England on the continental shelf is at its highest levels, and there remains a continental shelf edge occurrence in the mid-Atlantic bight.

The greatest threat for sperm whales has been whaling. Hunting of sperm whales by commercial whalers declined in the 1970s and 1980s, and virtually ceased with the implementation of a moratorium against whaling by the IWC in 1988. In addition to whaling, sperm whales may be impacted by other shipping and fishing operations. Sperm whales have the potential to be harmed by ship strikes and entanglements in fishing gear, although these are not as great of a threat to sperm whales as they are to more coastal cetaceans.

There are four sources of information on the presence of marine mammals in the Maryland waters of the Chesapeake Bay: the MARP operated out of the NAIB, the Marine Mammal and Sea Turtle Stranding Program established by the Maryland DNR at the COL, the NOAA marine mammal stranding database, and NOAA large whale ship strike database. These data sources have indicated that there have been no reported ship strikes of sperm whales in Maryland and Virginia waters within the period of record (1904 to present). There have been reports of two sperm whales found dead on beaches near Assateaque Island: a male in June 1995 (with moderate decomposition) and a female in January 2000 (freshly dead) (Jensen et al. 2004).

A study of human-caused mortality and serious injury determinations for northwest Atlantic Ocean large whale stocks from 1999 to 2003 (Cole et al. 2005) did not include sperm whale statistics.

Blue Whale

The blue whale (*Balaenoptera musculus*) is the largest cetacean. They are found in all of the world's oceans and there are three recognized populations: North Atlantic, North Pacific, and Southern Hemisphere. The blue whale has been subdivided into three subspecies: *B. musculus intermedia* found in Antarctic waters; *B. musculus musculus* in the Northern Hemisphere; and B. *musculus brevicauda* (the "pygmy" blue whale) of the southern Indian Ocean and southwest Pacific Ocean.

For management purposes, blue whales that occupy U.S. waters are divided into three stocks: the western North Atlantic stock; the eastern North Pacific stock; and the Hawaiian stock. The Western North Atlantic Stock is the group found offshore of the Maryland-Delaware-Virginia coast. Little is known about the population size of blue whales in the western North Atlantic except for in the Gulf of St. Lawrence area, where 308 individuals have been catalogued. While an abundance estimate cannot be accurately estimated, it is believed that the blue whale population in the western North Atlantic may number only in the low hundreds.

NOAA has not designated critical habitat for these species. This species is known to inhabit and feed in both coastal and pelagic environments. Blue whales are frequently found on the continental shelf but also occur far offshore in deep water.

Distributions of this species are not clearly understood. It is assumed that blue whale distribution is governed largely by food requirements and that populations are seasonally migratory. Poleward movements in spring allow the whales to take advantage of high zooplankton production in summer. Movement toward the subtropics in the fall allows blue whales to reduce their energy expenditure while fasting, avoid ice entrapment in some areas, and engage in reproductive activities in warmer waters of lower latitudes. The distribution of the blue whale in the western North Atlantic generally extends from the Arctic to at least mid-latitude waters. Blue whales are most frequently sighted in the waters off eastern Canada, with the majority of recent records from the Gulf of St. Lawrence. The blue whale is considered only an occasional visitor in U.S. waters. Records have suggested an occurrence of this species south to Florida and the Gulf of Mexico, although the actual southern limit of the species' range is unknown.

Although blue whales were too fast and powerful to be targeted by early whalers, modern commercial harvesting made it possible to harvest the species at commercial levels. This activity peaked between 1900 and 1960 and the species has been protected since 1966. Blue whales are at least occasionally injured or killed by ship collisions. Several blue whales have been photographed in California with large gashes in their dorsal surface that appear to be from ship strikes. It is estimated that between 9 to 25 percent of the whales in the Gulf of St. Lawrence have injuries or scars attributed to contact with ships.

There are four sources of information on the presence of marine mammals in the Maryland waters of the Chesapeake Bay: the MARP operated out of the NAIB, the Marine Mammal and Sea Turtle Stranding Program established by the Maryland DNR at the COL, the NOAA marine mammal stranding database, and NOAA large whale ship strike database. These data sources indicate that no blue whales have been observed or stranded in Maryland and Virginia waters from 1904 to the present (Jensen et al. 2004).

A study of human-caused mortality and serious injury determinations for northwest Atlantic Ocean large whale stocks from 1999 to 2003 indicates no human-caused serious injuries to or mortalities of blue whales in the Chesapeake Bay or nearby coastal waters. (Cole et al. 2005).

III. ANALYSIS OF EFFECTS TO FEDERALLY LISTED SPECIES IN PROJECT AREA

A. Shortnose Sturgeon

1. Impacts to Individuals

Any SNS that may be in the area during construction would be displaced. Transient adult, juvenile, larval, and young-of-the-year sturgeon feed primarily on zoobenthos and appear to remain close to the substrate providing the potential for entrainment. Any individuals that are entrained as part of dredging operations would likely be killed. Although there is some risk of entrainment of SNS during in-water construction, this is a negligible risk at this site, since no SNS have been reported in the project area.

The nearest SNS catch was approximately 8.5 miles east of the proposed Masonville DMCF site in the mouth of the Patapsco River. No SNS have been captured as part of fisheries surveys conducted from 2003 to 2005 in the project area. Since there have been no SNS caught in the Patapsco River upstream of the mouth or within the Baltimore's Inner Harbor, any SNS in the area are likely to be transient. No effect to this species is anticipated as a result of the proposed Masonville DMCF.

2. Impacts to Habitat

The proposed Masonville DMCF would permanently turn 123 acres of open water into terrestrial habitat. An additional 7 acres of open water would be affected by the construction of the toe dike

and barge moving. Since there is no designated critical habitat within the project area, no effect to SNS critical habitat is anticipated.

SNS have separate foraging, over-wintering, spawning, and larval/juvenile habitat. The loss of open water habitat is not expected to have a substantial impact on the various habitats used by SNS populations. Consistent with nearby East Coast populations, feeding habitat would be most important during April to October. Productive reaches of the upper Chesapeake Bay (e.g. near the saltwater/freshwater interface and channel areas bordering mud flats or emergent macrophyte beds) are potential feeding areas (NMFS 1999a). Based on foraging patterns exhibited by SNS in other northeast river systems, SNS in this system are likely to be widely dispersed and actively feeding during the summer. Feeding is generally thought to be most important when water temperatures range from 45 to 82˚F (7 and 28˚C). Most of the Masonville DMCF site is less than -17 ft although one previously dredged area on the eastern side reaches a maximum depth of approximately -40 ft. Fisheries studies in the vicinity of the proposed Masonville DMCF have not collected any species that would be indicative of unique habitats relative to those available within the Patapsco River and Inner Harbor of Baltimore. Therefore, the proposed Masonville DMCF footprint is not likely to be provide unique or critical habitat for SNS or other fish species.

Spawning, over-wintering, and larval/juvenile habitat are not expected to be impacted. SNS spawning and early life history typically takes place in the freshwater reaches of fast-flowing river systems. No SNS spawning habitat has been identified in the Chesapeake Bay and salinities near the project area range from approximately 2 to 11 ppt. Most of the mainstem north of the Bay Bridge is considered potential over-wintering habitat and, since it is only a tributary, the Patapsco River is unlikely to be over-wintering habitat for SNS. However, the depths of the habitat important to the larval and juvenile stages of SNS would be found above the saltwater/freshwater interface, on gravel/sand/mud substrate, and deeper channel areas [32.8 to 65.6 feet (10 to 20 m) deep] in freshwater rivers (Pottle and Dadswell 1979). Since most of the Masonville site has an average depth of approximately 10 ft (3 m), it is unlikely that larval and juvenile SNS would utilize most of the area, if SNS utilized this upstream portion of the Bay at all.

Water quality impacts due to construction are expected to be short-term and minor. Removal of the overburden from sand borrow excavation areas will occur by clamshell (bucket) dredge and will be removed from the area by barge. Site constuction will employ silt curtains to minimize turbidity in the waterway. Modeling and elutriate testing of the overburden and dike construction materials indicated that little dissolution of contaminants is expected to occur. After construciotn of the site, effluent discharges through the spillways would be monitored, and must meet State water quality standards. A State of Maryland water quality certification and a wetlands license will be required. Turbidity and other water limits would be prescribed in these documents. An extensive monitoring plan, such as the one used at the Poplar Island Environmental Restoration Project, would be established.

3. Impacts to Prey

Juvenile SNS feed mostly on benthic crustaceans and insect larvae, while adults feed largely on mollusks, polychaetes, and small benthic fish (Gilbert 1989). An additional 123 acres of open

water habitat (130 acres of river bottom) that support potential SNS prey would be lost to accommodate the proposed project. Prey individuals will be destroyed or displaced as a result of project expansion and borrow actions. The reduction of benthic communities as a result of site construction would reduce biomass available for fish consumption, although SNS utilization of the site is not expected. Benthic community surveys were completed in the vicinity of Masonville. Of the seven sites surveyed within the proposed alignment, five sites had a benthic community that was either degraded or severely degraded. The remaining two sites had the minimum Index of Biological Integrity value to meet restoration goals. The Masonville site does not contain unique or critical habitat for SNS prey species.

SNS prey occur over a broad area of the Patapsco River and Chesapeake Bay. Although the project will cause loss of open water and benthic habitat for SNS prey species, population levels of prey species are expected to remain regionally healthy because of the ready availability of these lost habitats elsewhere in the Patapsco River and Chesapeake Bay. The constructed sandy and rocky dikes of the containment facility and mitigation efforts within Masonville Cove adjacent to the project area may provide improved habitat for SNS prey species. This should partially compensate for the loss of open water habitat and disturbance to bottom habitats.

4. Cumulative Impacts

The cumulative effect of the Masonville DMCF and other harbor projects was evaluated in terms of the regional loss of open water habitat. Since 1984 approximately 1,294 acres of open water habitat have been lost due to previous DMCF and other fill activities within the lower Patapsco River and adjacent areas of the Bay. Up to 791 additional acres are being considered for development and fill in the foreseeable future, predominantly to meet projected dredged material management needs. Because most of this acreage (except for approximately 100 acres), is not proposed for wetlands or other aquatic habitat restoration, these would be permanent losses of open water habitat.

In addition to the open water acreages, new work dredging operations will impact River bottom. The current new work dredging projects are detailed in the Masonville DEIS and would constitute up to 13 additional acres of impact for deepening or reconfiguration of berthing areas. These areas would be permanently deepened below the pycnocline for the Harbor (-15 feet) and could become anoxic in summer, resulting in a loss of benthic and fish habitat. Some areas that may be affected by the proposed and existing projects already have depths greater than -15 ft.

The conversion of 2,085 acres of open water habitat within the Patapsco River and adjacent areas of the Bay will permanently displace fisheries resources from these areas. This acreage includes the existing and potentially proposed DMCFs and a terminal: HMI DMCF, Cox Creek DMCF expansion, Seagirt Marine Terminal, proposed Masonville DMCF, proposed BP-Fairfield DMCF, and proposed Sparrows Point DMCF. Because the lower Patapsco River supports both anadromous and marine species, both migratory and resident fish are likely to be displaced. However, many of the mitigation options being considered are being designed to improve water quality, soften shorelines, cap contaminants and enhance fisheries habitat within the lower Patapsco River. It is expected that mitigation and associated improvements will compensate for cumulative impacts to fisheries.

B. Sea Turtles

1. Impacts to Individuals

Some dredging activities are known to entrain sea turtles that might be in the area during dredging (specifically Kemp's ridleys and loggerheads that feed on mollusks and crustaceans at the bottom). Fifty-five sea turtle incidental takes, mostly loggerheads, have been reported in Virginia waters since 1994. Incidental takes in Virginia occurred from April through November. The takes resulted from hopper dredging of the navigation channels at the mouth of the Chesapeake Bay and were likely a result of the hopper dredges moving through the water and the suction created at the draghead (NMFS 2002). A mechanical dredge (clamshell or backhoe) would be used to remove the unsuitable material at Masonville. It is unlikely that a mechanical dredge would capture a sea turtle. A hydraulic cutterhead dredge would be used to mine and place the sand needed for dike construction at the proposed Masonville DMCF site. Cutterheads use a rotating cutterhead with teeth and suction to remove dredged material. Although entrainment is possible, cutterhead operations would pose much less risk to turtles since they move slowly and the cutterhead is likely to keep the turtles away from the suction pipe. In addition, sea trutles are not known to use the Harbor so entrainment risk during construction is negligible No dredging activities in Maryland Chesapeake Bay waters have resulted in a sea turtle incidental take. Sea turtles are more prevalent in Virginia portions of the Chesapeake Bay and are very rare north of the Bay Bridge.

Although direct monitoring was not performed, there were no sea turtles identified in any of the finfish surveys or wildlife monitoring during the 2003 to 2005 environmental studies in the Masonville study area. Sea turtles are migratory individuals that are seasonal transients to the Chesapeake Bay and no effect is expected to the species.

2. Impacts to Habitat

Since there is no designated critical habitat within the project area, no effect to sea turtle critical habitat is anticipated. No nesting is known to occur within the Chesapeake Bay (Evans et al. 1997). The Chesapeake Bay is used only as developmental and foraging habitat by sea turtles in the summer months. Open water habitat at the proposed Masonville DMCF site that is to be transformed into upland habitat would be permanently lost to sea turtles. However, because no sea turtles are known to be using the Patapsco River, there would be no detrimental impacts to sea turtle populations. Additionally, habitat similar to that of the proposed Masonville DMCF site is found elsewhere in the Patapso River.

Measures discussed to minimize construction impacts to SNS habitat apply for sea turtles also.

3. Impacts to Prey

Impacts to sea turtle prey are similar to those SNS prey would experience, although sea turtles typically prey on larger prey items than SNS. Overall, prey would be displaced, but no substantial negative impact is expected to regional populations. Although recreational crabbing

occurs in the vicinity of Masonville, it is minor and crabs are found in low densities. There are no significant mollusk resources within the expansion area or most of the Patapsco estuary.

4. Cumulative Impacts

Cumulative effects from other projects discussed in the section on SNS impacts should not be significant relative to sea turtles because sea turtles are mobile, seasonal transients, and have opportunistic feeding habits. Their seasonally limited presence in Maryland Chesapeake Bay waters and lack of confirmed presence in the Patapsco River minimizes sea turtle exposure to proposed project activities.

C. Whales

1. Impacts to Individuals

No whales are known to utilize the Baltimore Harbor. The closest record of large whale utilization was several humpback whales seen feeding under the Bay Bridge (approximately 27 miles south of Masonville). All reports of whales from the Harbor area appear to be of whales brought in by ships. Humpback whale juveniles are likely using the lower reaches of the Chesapeake Bay, but should not be affected by the construction or operation of the proposed Masonville DMCF. NOAA incidental take reports from the northeast coast from 2002 to 2006 did not include any right, fin, or humpback whales. These incidental take reports did include some dredging as well as fishing. No listed large whales have been entrained in dredging equipment or entangled in fishing gear within the Chesapeake Bay since 2000. The only ship strikes of large listed whales reported in the Bay in the last 10 years have been near the mouth of the Bay, over 130 miles south of the Masonville site. On April 18, 2006 a sei whale was found dead on the bulbous bow of a cargo ship in the Baltimore Harbor. It is likely that the sei whale was struck in the ocean and brought all the way up the Bay with the ship. Prior to this incident, the most recent confirmed whale in the Maryland waters of the Chesapeake Bay was a minke whale in 1999 on Kent Island which is over 27 miles south of the Masonville site. Since there is no evidence of large whales living within or transient to the Baltimore Harbor or upper Chesapeake Bay and there have been no large whales affected by dredging equipment in the last several years, the construction and operation of the Masonville DMCF are not expected to have an impact on right, fin, humpback, blue, sperm, or sei whales.

The concern of NMFS relative to listed whales is predominantly the potential for increased ship traffic after the Masonville DMCF is developed into a marine terminal, and as the Port grows or expands. The right whale, in particular, is vulnerable to ship strikes. Port traffic is expected to increase 1.8 times over the twenty year life of the Masonville DMCF. Masonville is only one of several sites that will be needed to maintain the current and future operations of the Port, so only approximately 30 percent of the growth can be attributed to the Masonville DMCF. It is difficult to ascertain the role of the Port of Baltimore in any of the ship strikes in the region as Baltimore shares the mouth of the Chesapeake Bay with the Port of Norfolk and the mouth of the Delaware Bay with the Ports of Wilmington and Philadelphia. However, as mentioned previously, listed whale ship strikes within the region are low at the current level of shipping. The increased ship

traffic that can be attributed to Masonville is not expected to have an impact on the right, fin, humpback, sei, blue, or sperm whales.

2. Impacts to Habitat

The listed whale species generally prefer the deeper and higher salinity waters of the open ocean and lower Chesapeake Bay. There are no right, fin, humpback, sei, blue, or sperm whales using the Baltimore Harbor. Therefore no impact to the habitat of those species is expected. The critical habitat for the right whale does not include the Chesapeake Bay and there is no critical habitat designated for humpback, fin, blue, sei, or sperm whales. Therefore, no critical habitat for humpback, fin, blue, sei, sperm, or right whales will be affected.

3. Impacts to Prey

The prey of right, fin, humpback, and sei, is predominantly small schooling fish species and planktonic crustaceans. Although some of these resources occur within the Chesapeake Bay, they are limited within Baltimore Harbor, relative to the mainstem of the Bay. In addition, the predominant foraging areas for all of these species in this region are on the continental shelf and no whales have been known to use the Baltimore Harbor for foraging. Since there are no right, fin, sei, or humpback whales using the Baltimore Harbor and only humpbacks have been observed utilizing the Maryland waters of the Bay it is unlikely that their prey would be affected by project activities. Prey species for whales would not be affected by any increase in ship traffic that would be associated with the proposed Masonville DMCF.

Blue whales are believed to feed almost exclusively on krill, which do not occur in the Chesapeake Bay, so no impacts to blue whale prey will occur. The primary prey species for sperm whales is deepwater squid, which only occur in the open ocean. They also feed on smaller squid, octopus, skate, and several species of fish, which are more prevalent in the saltier reaches of the Bay in Virginia waters. These prey species would not be affected by the construction of the proposed Masonville DMCF or any increase in ship traffic that would be associated with the proposed Masonville DMCF.

4. Cumulative Impacts

Cumulative effects from other projects discussed in the section on SNS impacts should not be significant relative to right, fin, humpback, sei, blue, and sperm whales because large whale species are not found in the upper Chesapeake Bay or Baltimore Harbor and, therefore, would not be exposed to the proposed project. The overall increase in shipping traffic to the Port of Baltimore is estimated to be 1.8 times higher within the 20-year planning window (Storms 2006). Development of a marine terminal at the Masonville DMCF would only cause a minor increase in ship traffic. If it is assumed that neighboring Ports will increase Port calls at a similar level within the 20-year planning window, the net increase in ship traffic along the two approaches to the Baltimore Harbor (Delaware River and mouth of the Chesapeake Bay) would increase by 1.8 times. This is a conservative estimate, but considering the relatively low numbers of ship strikes in this region, the increase is not likely to have a significant impact on right, fin, adult humpback, blue, sei, or sperm whales. Because juvenile humpback whales are increasingly using the Mid-

Atlantic region for foraging in some seasons, there may be more in the vicinity of shipping routes into the Bay within the 20 year planning window. This could result in an increase in the number of ship strikes with juvenile humpback whales utilizing the mouth of the Chesapeake Bay due to increases in all Port activities in the region. However, ship strikes do not always result in mortality. The number of ship strikes per year that are associated with mortality of right, fin, humpback, sei, blue, and sperm whales is low in the region and an increase in ship traffic is not expected to have a significant impact on whale mortality rates. There are more humpback whale mortalities and serious injuries associated with entrainment in fishing gear than there are with ship strikes (Cole et al. 2005).

IV. FEDERAL AGENCY'S OPINION ON PROJECT IMPACTS

In summary:

1. Kemp's ridleys and loggerheads are the two species of sea turtles most frequently identified in Maryland Chesapeake Bay waters. Kemp's ridleys, loggerhead, green, and leatherback sea turtles; right, fin, humpback, sei, blue, and sperm whales; and SNS are not known to occur near the project area.

2. The proposed project would fill 130 acres of open water, this includes the conversion of 123 acres of open water in the Patapsco River into upland habitat, resulting in a permanent loss of potential, though unlikely, habitat and the conversion 7 acres of open water to shallower open water with manmade substrate. However, the proposed mitigation in Masonville Cove and the Masonville containment dikes may provide improved habitat for potential SNS and sea turtle prey species (by enhancing benthic forage and crab habitat).

3. There is little potential for sea turtles, whales, and SNS to be in the project area and be directly impacted by construction or operations. SNS have been found at the mouth of the Patapsco River (approximately 8.5 miles away) and could be transient in the project area. However, the potential for direct impacts are not anticipated due to the fact that no SNS, whales, or sea turtles have been recorded in the project area by recent monitoring efforts and they are likely to only be transient to the project area. Construction equipment is unlikely to entrain SNS or sea turtles. Clamshell (bucket) dredge and barges will be used to remove the overburden from sand borrow areas, and a hydraulic cutterhead dredge will be used to dredge the sand and place the material in the dike or stockpile. Both of these types of dredges have a low risk of entraining SNS and sea turtles.

4. Fisheries investigations in the vicinity of the proposed Masonville DMCF have not identified rare or unique aquatic habitats or critical habitat for SNS, whales, or sea turtles. The open waters of the proposed project area that will be impacted from the proposed action are available in other portions of the Patapsco River.

5. Increases in ship traffic that can be associated with the project are difficult to ascertain, but the overall increase in ship traffic is not expected to impact listed whale species due to the relatively low levels of ship strikes along the two major approach routes to Baltimore at the present time.

6. Proposed mitigation occurring in Masonville Cove adjacent to the project site will support a variety of prey species. The creation of this habitat is expected to compensate somewhat for loss of open water and benthic habitats.

7. There will be a cumulative permanent loss of 2,085 acres of bottom and open water habitat in the Patapsco River and adjacent areas of the Bay due to existing and proposed DMCFs, if all foreseeable actions are implemented. Of the 2,085-acre total, 1,294 acres of this total are existing DMCFs or other major fill activities and up to 890 acres are proposed activities in the foreseeable future. However, SNS, whales, and sea turtles are not using this area. There are no anticipated impacts to these species at this time.

In conclusion, the Baltimore District, after reviewing relevant fisheries information and analyzing potential project impacts, has determined that the proposed action will have no effect on shortnose sturgeon, whales, sea turtles, or their critical habitat.

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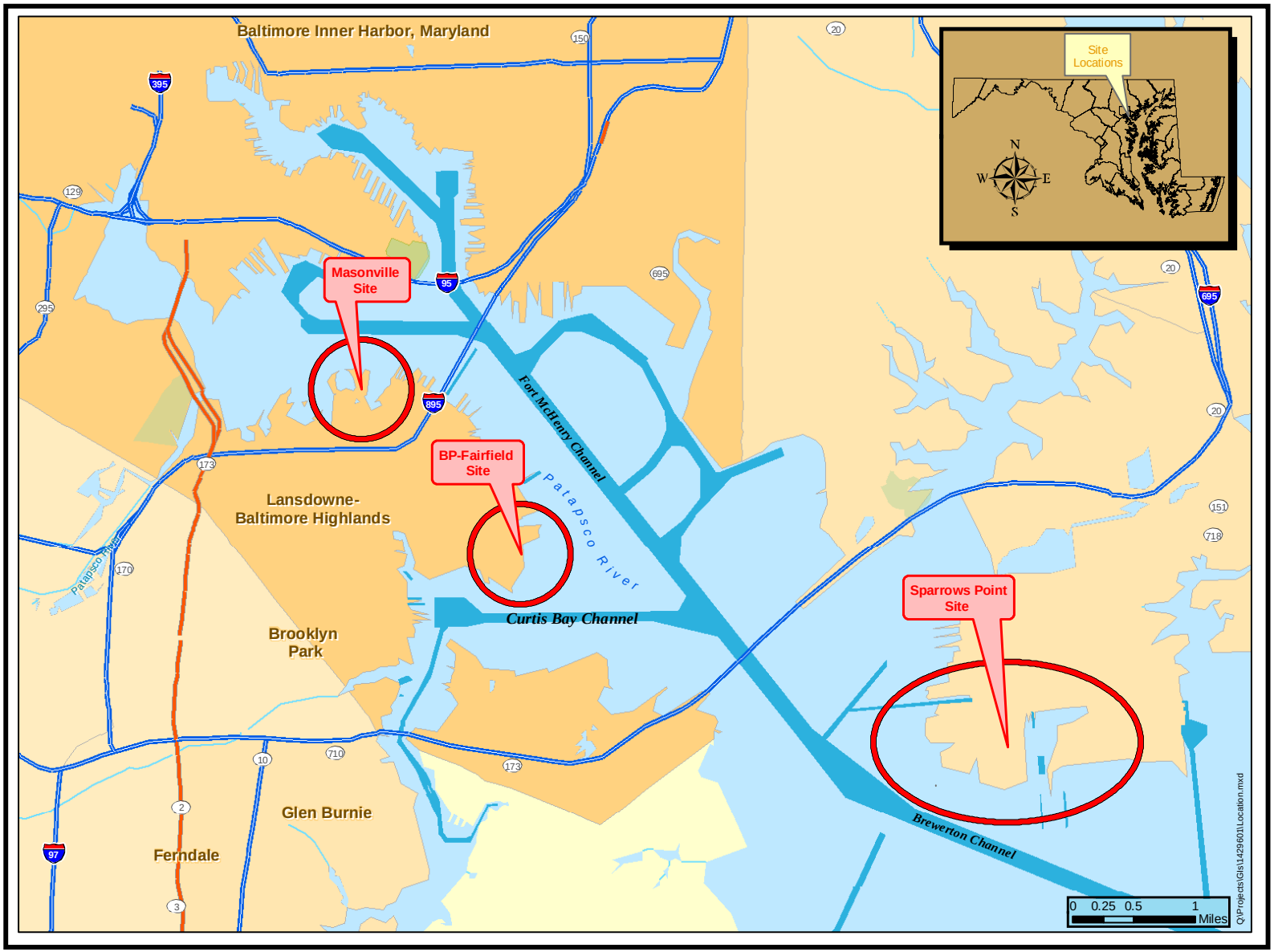

Figure 1. Location of MPA Proposed Dredged Material Containment Facilities

Figure 2. Proposed Masonville DMCF Alignment

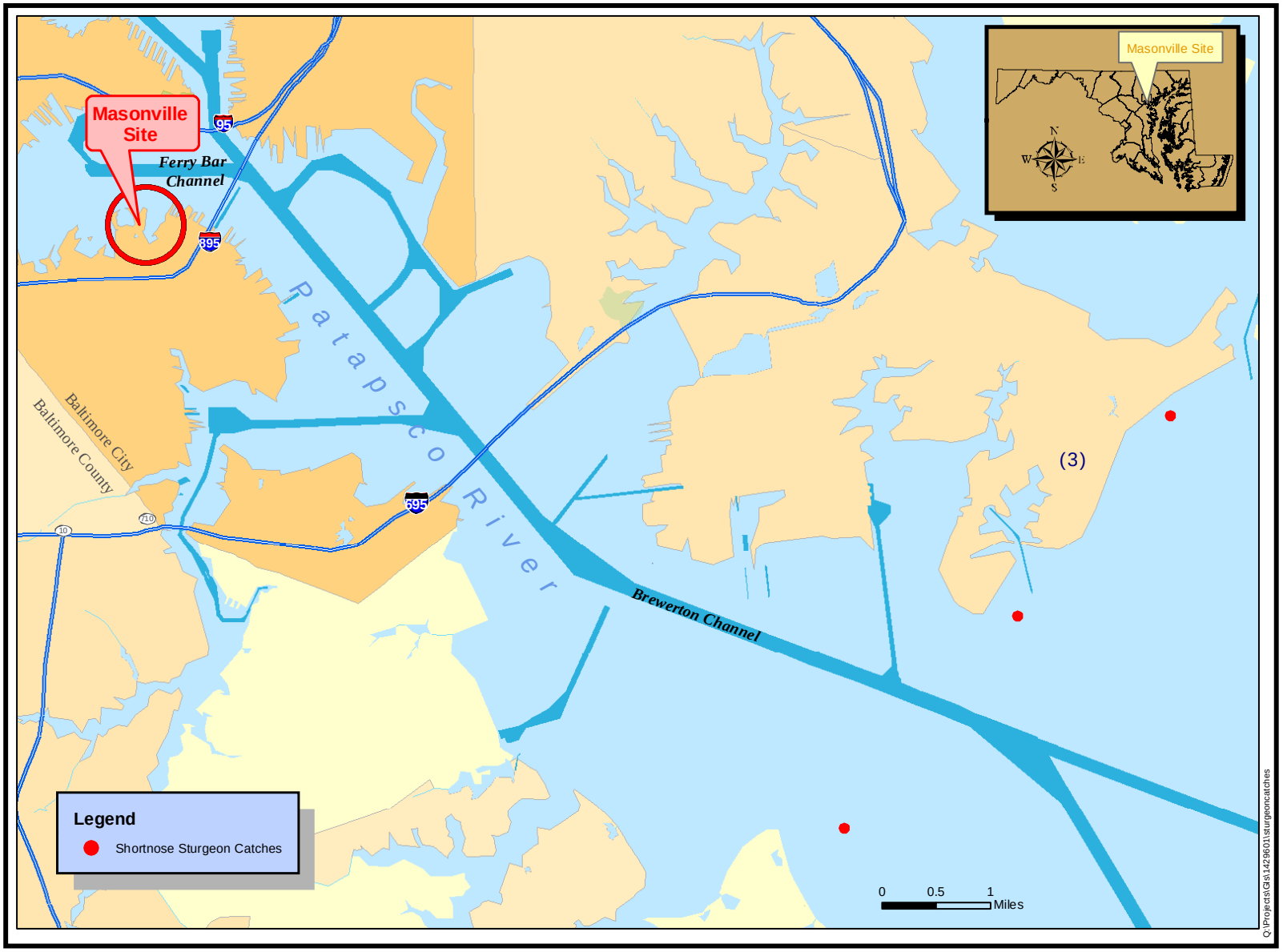

Figure 3. Location of Shortnose Sturgeon Catches near the mouth of the Patapsco River

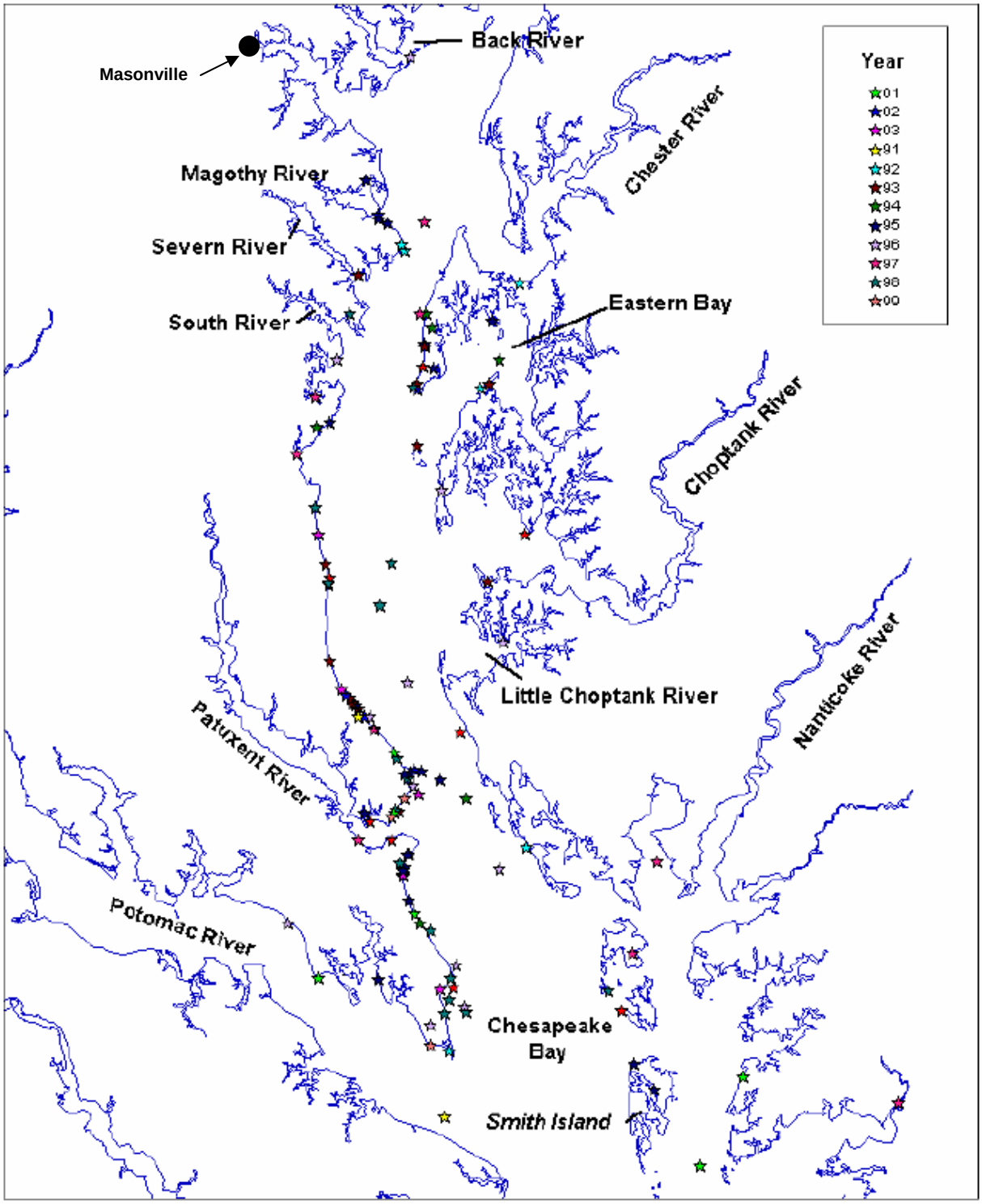

Figure 4. Locations of Sea Turtle Strandings in Maryland Portion of the Chesapeake Bay 1991 to 2003. See text for details (reproduced from Kimmel, 2004)

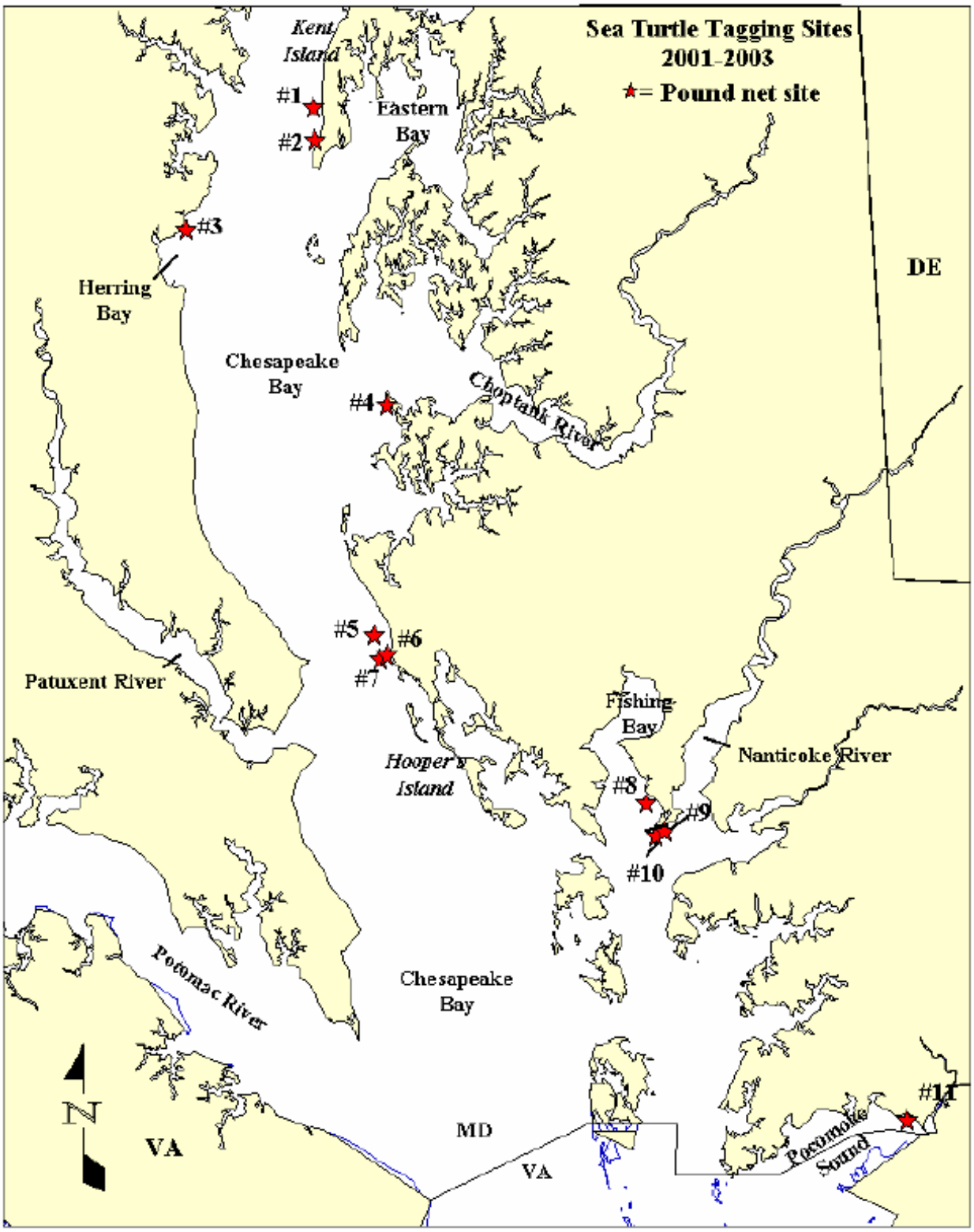

Figure 5. Pound net sites in the Chesapeake Bay in which Incidentally captured Sea Turtles were Examined and Tagged, 2001 to 2003. See Table 2 for details. (Reproduced from Kimmel, 2004)

ATTACHMENT D-1

CORRESPONDENCE FROM NMFS ON ENDANGERED SPECIES

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

OCT 11 2005

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SCIENCE AND TECHNOLOGY
OCT 13 2005
RECEIVED
SPARKS, MD

Jane Boraczek
EA Engineering, Science and Technology, Inc.
15 Loveton Circle
Sparks, Maryland 21152

Dear Ms. Boraczek,

This is in response to your letter dated September 9, 2005 requesting information on the presence of species listed as threatened and/or endangered under the jurisdiction of NOAA's National Marine Fisheries Service (NMFS) in the vicinity of the Masonville Marine Terminal site located in Baltimore, Maryland. The Maryland Port Administration (MPA) is determining the feasibility and suitability of the Masonville site for the confined placement of dredged material from Baltimore Harbor.

The Masonville site is located west of the Baltimore Harbor Tunnel in South Baltimore. MPA's study of the site is based on the need to identify sites to manage approximately 1.5 million cubic yards (cy) annually of material dredged from Baltimore Harbor for at least 20 years. Dredged material placement at the Masonville site would predominantly involve sediment dredged from the Patapsco River, upstream of the line between North Point and Rock Point. The proposed placement at the site includes the construction of a dredged material placement facility (for expansion of the existing marine terminal) and the enhancement of Masonville Cove. The final use of the placement facility would include development for maritime and commercial industry. The proposed alignment is an 117-acre alignment with a total footprint of 120 acres. The project would also include remediation of the Kurt Iron and Metal facility, including encapsulation of existing contaminants. EA Engineering is preparing an Environmental Impact Statement for the project.

Several threatened and endangered species under the jurisdiction of NMFS can be found in the Chesapeake Bay and its tidal tributaries. Several species of sea turtles are known to be present in the Chesapeake Bay from April 1 – November 30 each year. Loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempi*), and green sea turtles (*Chelonia mydas*) are present in the Chesapeake Bay, mainly during late spring, summer and early fall when water temperatures are relatively warm. An estimated 3,000 - 10,000 loggerhead turtles and 500 Kemp's ridley sea turtles are found in the Chesapeake Bay annually. In the Chesapeake Bay, Kemp's ridleys frequently forage in shallow embayments, particularly in areas supporting submerged aquatic vegetation and on tidal flats. Approximately 95 percent of the loggerheads found in the Chesapeake Bay are juveniles; these turtles are found most commonly from the mouth of the Bay to the Potomac River while foraging along channel edges. The summer developmental habitat

for green turtles encompasses estuarine and coastal waters of Chesapeake Bay and this species occurs in the Chesapeake Bay in warmer months. Leatherback sea turtles (*Dermochelys coriacea*) are predominantly pelagic but are also seasonally present in the Chesapeake Bay. Recent data from sightings and incidental captures in fishing gear indicate that loggerhead and Kemp's ridley are the species of sea turtles most likely to be found in the waters of Chesapeake Bay while leatherback and green sea turtles are less common in the area. Sea turtles are less common in the upper Bay and are not known to occur in Baltimore Harbor.

The federally endangered shortnose sturgeon is known to be present in the Chesapeake Bay. The NMFS recovery plan (1998) indicates that shortnose sturgeon found in the Chesapeake Bay and its tributaries are considered part of the Chesapeake Bay population. The US Fish and Wildlife Service Reward Program for Atlantic Sturgeon began in 1996. Through the fall of 2004, the incidental capture of fifty-seven different shortnose sturgeon had been reported via the reward program in the Chesapeake Bay and its tributaries – four from the lower Susquehanna River, two in the Bohemia River, six in the Potomac River, two south of the Bay Bridge near Kent Island, one near Howell Point, one just north of Hooper's Island, one in the Elk River and two in Fishing Bay. The remaining shortnose sturgeon were captured in the upper Bay north of Hart-Miller Island. All fish were captured alive in either commercial gillnets, poundnets, fykenets, eel pots, hoop nets, or catfish traps. While no shortnose sturgeon have been captured in Baltimore Harbor, shortnose sturgeon occur in other heavily industrialized areas (i.e., Philadelphia, New York Harbor) and have been captured in the Bay in the vicinity of Baltimore Harbor. As such, the best available information suggests that shortnose sturgeon may occasionally occur in Baltimore Harbor.

Shortnose sturgeon may be affected by the creation of a dredged material management site if foraging or overwintering habitats are destroyed. Shortnose sturgeon are also vulnerable to entrainment in dredges and may be affected by construction necessary for site preparation. In addition, the placement of contaminated sediments at the site has the potential to affect water quality in the area. These effects should be considered in the EIS.

Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) are distributed along the entire East Coast of the United States and have been designated a Species of Concern by NMFS. Many populations, including those found in the Chesapeake Bay, have undergone drastic declines in abundance since the late 1800s. Consequently, NMFS has initiated a status review for this species to determine if listing as threatened or endangered under the ESA is warranted. If it is determined that listing is warranted a proposed rule would be published and a final rule could be published within a year of the proposed rule. While Atlantic sturgeon currently receive no protection under the ESA, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on Atlantic sturgeon from this project.

Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, states that each Federal agency shall, in consultation with the Secretary, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Any discretionary federal

action that may affect a listed species must undergo Section 7 consultation. It is the understanding of NMFS that Federal permits will be required for this project. As listed species may be present in the project area, the federal action agency (i.e, the Army Corps of Engineers (ACOE)) is responsible for determining whether the proposed action is likely to affect any listed species. The ACOE should submit their determination along with a justification for the determination and a request for concurrence, to the attention of the Endangered Species Coordinator, NMFS, Northeast Regional Office, Protected Resources Division, One Blackburn Drive, Gloucester, MA 01930. After reviewing this information, NMFS would then be able to conduct a consultation under section 7 of the ESA. Should you have any questions about these comments or about the section 7 consultation process in general, please contact Julie Crocker at (978)281-9328 ext. 6530.

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

cc: Nichols, F/NER4 - Annapolis

File Code: Sec 7 ACOE NAB Masonville Marine Terminal

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

Vance Hobbs
Baltimore District, Corps of Engineers
Operations Division, Regulatory Branch
PO Box 1715
Baltimore, MD 21203-1715

MAR 23 2006

Attn: CENAB-OP-RMN

Dear Mr. Hobbs,

This is in response to your e-mail dated March 21, 2006 transmitting the Army Corps of Engineer's (ACOE) Preliminary Draft Environmental Impact Statement (PDEIS) for the proposed Masonville Dredged Material Confinement Facility. The Maryland Port Administration (MPA) is determining the feasibility and suitability of the Masonville site for the confined placement of dredged material from Baltimore Harbor. This letter transmits the comments of the Protected Resources Division (PRD) of NOAA's National Marine Fisheries Service (NMFS).

The Masonville site is located west of the Baltimore Harbor Tunnel in South Baltimore. The study of the site is based on the need to identify sites to manage approximately 1.5 million cubic yards (cy) annually of material dredged from Baltimore Harbor for at least 20 years. Dredged material placement at the Masonville site would predominantly involve sediment dredged from the Patapsco River, upstream of the line between North Point and Rock Point. The proposed placement at the site includes the construction of a dredged material placement facility (for expansion of the existing marine terminal) and the enhancement of Masonville Cove. The final use of the placement facility would include development for maritime and commercial industry. The proposed alignment is a 117-acre alignment with a total footprint of 120 acres. The project would also include remediation of the Kurt Iron and Metal facility, including encapsulation of existing contaminants.

As noted in our letter to the applicant's consultant (EA Engineering) dated October 11, 2005, the best available information suggests that shortnose sturgeon (*Acipenser brevirostrum*) may occasionally occur in Baltimore Harbor. NMFS agrees with the discussion in the PDEIS that use of Baltimore Harbor by shortnose sturgeon is likely to be rare and that the species would most likely be encountered in the deep channels rather than the near shore area proposed for the Masonville facility. As noted in the PDEIS, the ACOE will be initiating consultation pursuant to Section 7 of the Endangered Species Act (ESA) on the effects of the proposed action on shortnose sturgeon. NMFS anticipates that the assessment will focus on the likelihood of direct (injury, mortality) and indirect effects (suspension of contaminated sediments, destruction of

benthic resources) of the proposed project on shortnose sturgeon. NMFS looks forward to reviewing the assessment being prepared by ACOE.

As noted above, the final use of the facility will be for commercial and maritime industry. If this development will result in an increase in the number of large vessels using the port of Baltimore, ACOE should assess the potential for an increase in the number of vessel encounters with marine mammals. Large whales, particularly the endangered Northern Right Whale, are vulnerable to ship strikes. While whales are not common in the Chesapeake Bay, ships traveling to the Masonville site from outside of the Bay are likely to intercept known migration corridors of listed whales. For more information on assessing the potential for ship strikes, please contact Kristen Koyama, Northeast Regional Ship Strike Coordinator, at (978)281-9300 x6531 or by e-mail (Kristen.Koyama@noaa.gov). NMFS PRD offers no additional comments on the PDEIS. You may receive comments from NMFS Habitat Conservation Division under separate cover. Thank you for the opportunity to review the PDEIS. Should you have any questions regarding these comments or the Section 7 process, please contact Julie Crocker of my staff at (978)281-9300 x6530.

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
For Protected Resources

Cc: Nichols, F/NER4

File Code: Sec 7 ACE NAB Masonville Dredged Material Disposal Facility

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ESSENTIAL FISH HABITAT (EFH) EVALUATION

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APPENDIX D – ESSENTIAL FISH HABITAT IMPACT ASSESSMENT

DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE
MASONVILLE DREDGED MATERIAL CONTAINMENT FACILITY

BALTIMORE HARBOR, MARYLAND

May 2006

Prepared by: U.S. Army Corps of Engineers, Baltimore District

Pursuant to Section 305 (b)(2) of the Magnuson-Stevens Fishery Conservation & Management Act, the U.S. Army Corps of Engineers (Corps) is required to prepare an Essential Fish Habitat (EFH) Assessment for all proposed actions that occur within coastal waters of the United States. This assessment is being prepared to address impacts of the proposed expansion of the Masonville Terminal as a Dredged material containment facility. Based on the prescribed protocol for preparation of an EFH Assessment, this assessment is comprised of the following components:

1. A description of the proposed action;
2. A listing of the life stages of all species with EFH designated in the project area;
3. An analysis of the effects of the proposed action;
4. The Federal agency's opinions regarding the effects of the proposed action; and,
5. Proposed mitigation, if applicable.

I. DESCRIPTION OF PROPOSED ACTION

A. Purpose

The purpose of the proposed project is to create a dredged material containment facility (DMCF) to help meet the 20-year harbor dredging need to place 1.5 mcy of dredged material per year. The Baltimore District, U.S. Army Corps of Engineers in partnership with the State of Maryland Department of Transportation, Maryland Port Administration (MPA) coordinate the maintenance of the Port of Baltimore's channel system, and continually assess dredging needs and placement capacity. The Dredged Material Management Act was passed in May of 2001 and mandated that placement options to meet the short- and long-term shortfalls in dredged material placement capacity for the Chesapeake Bay Approach Channels and Baltimore Harbor Channels be identified. The MPA created a committee known as the Harbor Team to identify potential dredged material placement sites for material dredged from the Baltimore Harbor. The team recommended three options for consideration: expansion of the existing Masonville Marine Terminal, construction of a DMCF adjacent to the former BP Amoco Asphalt Terminal (BP-Fairfield), and construction of a DMCF adjacent to Sparrows Point. These locations are shown in Figure 1. The need to open a placement site by 2008 led to an accelerated permitting and evaluation process of the proposed Masonville DMCF. The proposed Masonville DMCF would

meet anticipated shortages in placement capacity beginning with placement of dredged material in 2009. The proposed Masonville DMCF would not only receive its intended annual placement of 0.5 to 1.0 mcy per year for the first few years, but would be overloaded, receiving 0.9 to 1.4 mcy per year for the first five years of placement in order to meet harbor placement needs.

The Harbor Team also recommended that cost-effective and safe innovative reuse options be used to process 0.5 mcy of dredged material by 2023. The MPA has created an Innovative Reuse Committee to move toward their goal of developing a strategy to process 0.5 mcy of dredged material in a cost-effective and safe manner by 2023.

B. Description of Proposed Action

The proposed Masonville DMCF is located in the middle branch of the Patapsco River, across from Locust Point near the Baltimore Harbor Tunnel (I-895). This site lies completely within the city of Baltimore limits. The Masonville site is bordered by the Patapsco River and Ferry Bar Channel to the north, an industrial site to the south, a habitat protection area to the west and southwest, and the existing MPA property to the east. The property containing the proposed facility alignment and the adjacent habitat protection area are owned by the MPA.

1. Alternatives Considered

Hundreds of alternatives were considered before selecting the current project site. Land use studies of Baltimore Harbor in conjunction with site-specific studies of potential sites were conducted. A team of Baltimore Harbor Stakeholders (county and local government and community groups), identified and evaluated at all potential options and recommended a suite of sites for further study. In addition, the multi-agency Bay Enhancement Working Group (which includes representatives from NMFS, USFWS, EPA, MD DNR, MGS, MDE, as well as the state and local sponsors) examined each perspective site and ranked the candidate sites based upon a suite of environmental and human use attributes. Masonville was the preferred alternative to meet the short-term goals of the annual dredging need described in I.A (above).

a. Proposed Masonville DMCF Alignment

The proposed Masonville DMCF footprint is 129 acres. Of this, 126 acres are bay bottom and 3 acres are existing land area. The proposed alignment includes a channel between the Masonville Terminal and the former Kurt Iron and Metal (KIM) facility and an area known as the Wet Basin adjacent to the Fairfield Marine Terminal. The facility will have a placement capacity of 16 mcy. The containment structure will consist of four sections: an onshore dike, a cofferdam, an armored dike, and a beach. The initial dike height for this project is +10 ft MLLW and a berthing structure will be constructed along the cofferdam portion of the containment structure. Both on-site and off-site material will be used during the construction of the containment structure. Two mcy of borrow material will be mined from below the site and unsuitable overburden within the borrow area will be removed (pre-dredged) prior to construction. More project implementation details are included in Section 2 (below). The proposed alignment for the Masonville DMCF is shown in Figure 2.

The proposed action also includes mitigation projects within the adjacent habitat protection area (Masonville Cove), including wetland creation, reef creation, submerged aquatic vegetation (SAV) seeding, beach creation, non-tidal wetland creation, and the development of a bird sanctuary.

b. No Action Alternative

The No Action Alternative would maintain existing conditions within the study area. The proposed DMCF would not be constructed and the 129 acre footprint would remain unaltered. However, this means that none of the mitigation projects associated with the proposed facility would be realized.

2. Project Area Description

The site includes shoreline, upland, and aquatic or open water areas. Prior to its acquisition by MPA in 1978, Masonville was used first for mining and then later as a dredged material placement site by Arundel Corporation. In addition to dredged material from Baltimore Harbor, the site was also used for the disposal of building and ship debris, mining tailings, and incinerator waste. After acquiring the property, MPA continued to use the site for dredged material placement through 1989. The Masonville peninsula is comprised of two sections, Phase I and Phase II. Phase I was completed as an automobile terminal in 2000. Final construction of Masonville Phase II began in 2002 to prepare this area for automobile storage. There is an inlet directly east of Masonville that is bordered by the former KIM Company and is part of the current Toyota facility. The former KIM site was operated as a ship scrapping facility until 1997. Since its purchase, an environmental assessment of the site has been completed, and clean-up efforts are currently underway.

The northwest shoreline of the site is natural, but littered with debris piles composed of treated timber, rubble, and concrete. Much of the shoreline along the footprint for the proposed alignment is composed of concrete and rubble with a steep, upland berm of vegetation. Along the western shoreline of the site, rubble, concrete, and old pilings make up the majority of the shoreline, with severe erosion occurring along the banks in some areas.

Environmental studies were conducted within the area from 2003 to 2005, including the following studies: water quality, sediment quality, fisheries and aquatic, benthos, SAV, shallow water habitat, terrestrial vegetation and wetlands, avian and other wildlife. Investigations into avian and wildlife species included studies related to rare, threatened and endangered (RTE) species.

The average depth of the site is approximately 10 ft, with a range of approximately 0 to 40 ft. Average water quality parameters for the site are shown in Table 1. The footprint of the proposed facility includes 120 acres of open water habitat. Studies have indicated that the substrate within the footprint of the proposed Masonville DMCF is predominately silts and clay, which is consistent with the Patapsco River as a whole. A small amount of SAV (0.38 acres) occurs within the proposed alignment with a total of 10 acres of Tier I/Tier II SAV (shallow water habitat, < 6.5 feet) occurring within the footprint of the proposed DMCF.

Table 1. Average Seasonal Water Quality Parameters Measured At Masonville Sampling Locations between 2003 and 2005

		Spring	Summer	Fall
Temperature (^oC)	Surface	24.4	26.3	18.2
	Mid	23.4	26.1	19.1
	Bottom	22.7	24.9	19.9
pH	Surface	8.3	8.3	6.1
	Mid	8.1	8.1	6.2
	Bottom	7.7	7.8	7.5
Dissolved Oxygen (mg/L)	Surface	9.4	9.6	8.1
	Mid	8.2	7.9	7.8
	Bottom	6.7	5.1	7.4
Salinity (ppt)	Surface	4.8	4.6	9.0
	Mid	5.3	4.9	7.4
	Bottom	5.5	5.8	4.0
Turbidity (NTU)	Surface	5.7	16.4	2.9
	Mid	6.7	14.7	4.5
	Bottom	9.2	10.9	5.5

To accommodate dike construction, approximately 15 feet of unsuitable (silty) overburden material (approximately 2 mcy) will be removed from parts of the proposed site to expose the sand/clay below, which is suitable for dike construction. The unsuitable material will be removed with a mechanical (clamshell) dredge and placed at Hart-Miller Island DMCF (a pre-existing contained facility). The containment (perimeter) dikes of the proposed DMCF will be similar to those used for the existing DMCFs in the area and will consist of a fine sand core with exterior slopes faced with various thickness of armor stone. Approximately 2 mcy of sand/clay are required for dike construction. Hydraulic dredging will used for the dike building activities. Dredged material from Harbor navigation channels and berthing areas would be placed within the facility and dewatered to accelerate consolidation of the dredged material. As a result of this process, water will be discharged through project spillways into the Chesapeake Bay. The majority of the construction for this project will be in the water, involving filling up to 120 acres of open water in the lower Patapsco River.

In order to construct the facility where it is planned, several additional activities will need to occur. The most significant pre-development task within the waterway involves remediation of derelict vessels on the eastern side of the site near KIM. Some are known to contain hazardous or other regulated wastes. The project, if approved, would allow 2 sunken and derelict vessels to be encapsulated in an environmentally safe and economical manner rather than disturbed and removed. A cleanup plan is being negotiated with MDE. Removal of significant debris from both the aquatic and terrestrial areas of Masonville Cove prior to any habitat enhancement will also need to occur. A cleanup plan may also be required for that area.

II. SPECIES WITH EFH IN THE PROJECT AREA

A Summary EFH Designation specific to the Patapsco River does not exist at this time. However, consultations with local NMFS staff revealed that all areas of the Bay with 0.5 ppt or greater salinity should technically be considered as EFH, based on EFH definitions for those federally managed species that occur in Maryland tidal waters of the Bay. Furthermore, an EFH Summary Designation for upper Bay waters nearest to the Patapsco River should be used for determining which federal species have EFH designated for waters of the project vicinity. In this case, the Summary Designation for the Chester River estuary in Kent and Queen Anne's County on Maryland's Eastern Shore was used in the preparation of an EFH Assessment for this project. Additionally, recent literature on fish distribution and ecology for the Chesapeake Bay, fish surveys conducted in association with the Masonville site review, and personal communications with local NMFS staff (Nichols, 2005) were used for determining which federal species with EFH designated for the Patapsco River likely occur in the project vicinity.

The Chester River lies within waters designated as EFH for the following species and their life stages: summer flounder (*Paralicthys dentatus*), juvenile and adult life stages; bluefish (*Pomatomus saltatrix*), juvenile and adult life stages; windowpane flounder (*Scopthalmus aquosus*), juvenile and adult life stages; cobia (*Rachycentron canadum*), all life stages; red drum (*Sciaenops ocellatus*), all life stages; king mackerel (*Scomberomorus cavalla*), all life stages; and Spanish mackerel (*Scomberomorus maculatus*), all life stages (NMFS, 2005a). Based on informal coordination with NMFS, it was determined that of the species with EFH designated in the project area, only juvenile and adult summer flounder and adult and juvenile bluefish are likely occur near the Study Area (Nichols NMFS, 2005). Summer flounder are generally rare north of the Bay (William Preston Lane) Bridge. Bluefish are more ubiquitous within the Bay and occur in the Harbor, but have to be common to be of concern for EFH (Nichols 2005).

Fisheries studies were conducted at Masonville within, and adjacent to, the proposed project areas in July 2003, May 2004, October 2004, May 2005 and August 2005. Trawling and gillnetting were conducted within the proposed Masonville DMCF footprint in three seasons: spring, summer, and fall. Most stations at Masonville were samples in July 2003, May 2004 and October 2004. Gillnetting was also conducted in the wet basin and Kurt Iron channel but only in May and August 2005. The BP-Fairfield and Sparrows Point Sites were also sampled by seine, gillnetting and trawling in three seasons. In addition the study included reference sites near the Key Bridge that were sampled by seine and gillnetting. (Figure 3). Trawling involved five minute paired tows using a 16 foot semiballoon otter trawl with a ¾ inch mesh liner. Gillnetting involved paired experimental gillnets (3/4-inch to 2-inch stretched mesh) set overnight. Each pair included one surface and one bottom set due to the depth of the water in some areas. Seining was conducted using a 100-ft seine with ¾-inch mesh and two passes were made at each station. The numbers of MSFMCA-managed species and significant prey species collected throughout the Harbor are included in Table 2. More complete results are available in the Masonville EIS.

Bluefish were collected at the Masonville site, but in very low numbers and only in warmer months. Length data suggests that all were juveniles. This is consistent with seine surveys of the upper Middle Branch of the Patapsco conducted over multiple years (EA 1991). Bluefish were

generally more abundant at the other areas sampled in the Harbor (Sparrows Point, BP-Fairfield, Sollers Point and Thoms Cove). This is expected because these sites have higher salinities than Masonville. A low number of summer flounder were also collected in the gillnets in Fall 2004 surveys (Table 2). This species was also collected in low numbers in gillnets and bottom trawls at all other Harbor sampling locations except Thoms Cove in Fall 2004. One summer flounder was also taken in trawls at BP-Fairfield in summer 2004. Based upon size distributions, both juvenile (less than ~170 mm) and second year subadults (greater than 220 mm) were collected at bottom salinities ranging from approximately 4.4 to 10.7 ppt. This is unusual for the Harbor based upon results of previous investigations and the salinity preference for this species. Summer flounder prefer salinities greater than 10 ppt. (Nichols 2005).

III. EFFECTS OF THE PROPOSED ACTION

The following provides a brief overview of pertinent natural history information of summer flounder and bluefish to serve as a basis for assessing impacts of the proposed action to these species. This natural history information is followed with an analysis of impacts to individuals, habitat, and prey of these species of the proposed action as well as cumulative impacts of other dredging and dredged material placement actions.

Water Quality Impacts

Temporary, localized changes are expected in clarity, color, and quality of surface waters in the immediate vicinity during pre-dredging, perimeter dike construction, and discharge through the spillways. Turbidity monitoring during both Phase I and Phase II construction of the Poplar Island Environmental Restoration Project indicated the turbidity levels quickly diminished to background levels, and the same conditions are anticipated during the construction of the Masonville DMCF. There is a potential for the release of toxics from onsite sediments due to pre-dredging. Elutriate testing and modeling of this potential is ongoing but results of monitoring in the vicinity of dredging operations within the Harbor channels has indicated that few chemical constituents in the water column were present at detectable concentrations, even as close as 40 m from the point of active dredging operations. The release of nutrients from the sediments during dredging is expected to be short term, temporary, and localized during the pre-dredging and construction of the DMCF. It is expected that time of year restrictions may be imposed to protect fisheries resources in the area.

During placement of dredged material into the facility, dewatering, and materials management within the facility, water will be discharged via spillways. These discharges could contain elevated levels of nutrients and TSS. Discharges from facility operations at Masonville will be required to comply with a SPDES Permit which will mandate the discharge water quality requirements for the project. It is anticipated that discharges at Masonville will be managed to meet an equivalent standard with respect to the current operations at HMI, which has not had a measurable impact to the resources within the adjacent waters since it began operations over 20 years ago.

III.1 Summer flounder (juvenile and adult life stages)

III.1.1 Natural History and Fishing Pressure

Adult and older juvenile summer flounder enter the Chesapeake Bay during spring and early summer and exit the Bay in fall (Murdy et al. 1997). Adult summer flounder overwinter in the ocean and only enter the Bay in late spring. Larvae and young juveniles migrate into the Bay in October and prefer shallower waters; they typically overwinter and grow in the southern portion of the Bay. Older juveniles are generally distributed inshore and in estuarine areas throughout their range during the spring, summer, and fall. During colder months they move into deeper (oceanic) waters and can be found offshore with adults (Murdy et al. 1997, Fahay et al. 1999). Table 3 provides information on general occurrence and habitat preferences of summer flounder in estuaries.

Both adults and juveniles exhibit a marked preference for sandy bottom and/or SAV beds, particularly areas near shorelines (NMFS 2000). SAV has been identified as a Habitat of Particular Concern (HAPC) for both juvenile and adult summer flounder under the tenets of the Magnuson-Stevens Act. Previous consultations with NMFS have indicated that summer flounder are more prevalent in the lower Bay than in the project area (Nichols, pers. comm., 2003).

Summer flounder feed on a variety of small fish, shrimp, and crabs that occur in the Chesapeake Bay. Prey include species such as grass shrimp (*Palaemonetes pugio*), bay opossum shrimp (*Neomysis americana*), Atlantic silversides (*Menidia menidia*), and bay anchovy (*Anchoa mitchilli*). The latter shrimp species prefer sand bottom and/or SAV, similar to summer flounder preferences, while forage finfish are generally widespread in occurrence in shallow waters. Each of these food items occurs in the vicinity of the study area (Table 2).

Summer flounder supports a commercial and recreational fishery (Packer et al., 1999). Overfishing is the principal stressor to the summer flounder population (MAFMC, 1997), and summer flounder stock has frequently been in an overexploited status. As of 2001, summer flounder was being overfished, but the stock was not in an overfished status (NMFS, 2002). By January 2003, summer flounder was not overfished nor was overfishing occurring, presumably due to successful implementation of stock rebuilding measures implemented through limiting fishing take (MAFMC, 2004).

III.1.2 Impacts Assessment

III.1.2.a Impacts to Individuals Direct impacts to summer flounder individuals are unlikely, even if construction occurs during warmer months, because flounder are strong swimmers and would be able to avoid dredging and construction disturbances. In addition, summer flounder were uncommon in site-specific fisheries studies (Table 2) and are generally uncommon north of the Bay (William Preston Memorial) Bridge in most years (Nichols 2005). During cooler weather months no direct physical impacts to individuals are expected because they are unlikely to be present. Chesapeake Bay program monitoring data for the Harbor indicates that water temperatures are below the optimum temperature for summer flounder (52°F, Table 3) from late November through about mid-April (Table 1). Site filling (i.e. dredged material placement

operations) will result in no additional alterations to or displacement of summer flounder habitat (post construction).

III.1.2.b Habitat Impacts Most of the Masonville DMCF area and Masonville Dove has silty substrates with sand in some places. Construction of the DMCF would cause the loss of 126 acres of silty Bay/river bottom, which is not preferred summer flounder habitat. Habitat restoration in Masonville Cove includes substrate improvements including augmenting the bottom with sandy material which would improve habitat for benthic forage species. This would improve EFH potential for summer flounder within the area.

Project construction will directly impact a small area (0.38 acre) of existing SAV in Kurt Iron channel. Therefore, there will be a small direct impact to summer flounder HAPC. Construction of the DMCF will fill approximately 10 acres of shallow water habitat (SWH) less than 6 feet deep, which is Tier I (existing SAV) and Tier II SAV (recovery) habitat. This is a long-term, direct impact. However, summer flounder utilization of the area is relatively low. There is a small (~0.5-1 acre) area of SAV in Masonville Cove that will not be disturbed for DMCF construction. The habitat improvements to Masonville Cove are being designed specifically to improve substrates and water quality to enhance fisheries and SAV expansion. SAV seeding is also being considered. Thus, direct impacts of the enhancement part of the project should benefit SAV, and thus increase summer flounder HAPC.

Summer flounder also utilize salt marsh guts (Table 3). The habitat improvements within the Cove include creation and/or enhancement of tidal wetland, which would also improve summer flounder habitat.

III.1.2.c Impacts to Prey DMCF construction would result in the loss of 120 acres of open water habitat and 126 acres of Bay/river bottom supporting summer flounder prey. Prey individuals will be destroyed or displaced as a result of project expansion and borrow actions in both locations. The reduction of benthic macroinvertebrate communities as a result of island expansion would reduce biomass available for consumption by summer flounder that may use these areas as feeding grounds. However, much of the area is highly degraded by sediment contaminants and only supports a degraded or very degraded benthic community. Also, forage fish and invertebrates consumed by summer flounder occur over a broad area of the Bay and Patapsco estuary. Although the project will cause loss of open water and benthic habitat for summer flounder prey species, the area is only marginally supporting summer flounder at the present time. In addition, the habitat that is enhanced/restored in the Cove will improve benthic conditions and diversify the in-stream habitat, which is expected to improve forage abundance, diversity, and availability for summer flounder.

III.1.2.d Cumulative Impacts Other dredging and placement actions occur in the immediate vicinity of the project area. Periodic maintenance dredging is conducted in the Harbor navigation channels and private spur channels of this active Port. Maintenance dredging of the federal channels in these locations would result in displacement of flounder and forage resources immediately after dredging which would constitute a short-term impact. The outer channels of the Harbor are maintained every few years but the channels near Masonville are dredged much less frequently, which lowers the potential for cumulative impacts. There are also periodic

maintenance dredging and placement activities associated with other portions of the Baltimore Harbor and Channels federal project in the mainstem of the Bay including the Swan Point Channel, Tolchester Channel, and the approach channels to the Chesapeake & Delaware Canal. Activities north of the Bay Bridge, however, should have little additional impact on the species because summer flounder are typically very rare or absent in these regions.

The State of Maryland currently owns and operates two DMCFs within the lower Patapsco estuary and immediately outside the mouth of the Patapsco River. In addition to Masonville, two other potential DMCFS are currently under consideration. Recent and reasonably foreseeable human actions that have converted or would convert open water habitat to uplands include the Hart Miller Island DMCF, the rehabilitation of Cox Creek DMCF, the Masonville DMCF, and the proposed 2nd and third harbor placement options. Currently these options include placement facilities at Sparrows Point and/or BP-Fairfield. The Cox Creek facility was constructed in the 1960s by Kennecott Refining Co. and was rehabilitated to accept Harbor materials beginning in 2002. At that time, 5 acres of in-water construction were necessary to rehabilitate the existing dikes. It is anticipated that at least one additional placement site will be required after Masonville.

If all of the proposed projects are implemented, approximately 2070 acres of open water habitat will be lost and bottom habitat will be lost and/or disturbed in or near the Patapsco River. At HMI, 1140 acres is going to be developed into wildlife habitat after closure. The other sites will be redeveloped as Port facilities and constitute a loss of ecological function. However, it is anticipated that any loss of bay bottom (open water wetlands habitat) required for any of the proposed DMCF projects would be mitigated, per state and federal law. Additionally, summer flounder utilization within the Patapsco River appears to be low, so cumulative impacts to the species are not expected.

Much of the Harbor is quite deep, although the shorelines constitute SWH, which in the Chesapeake Bay is Tier I and Tier II SAV habitat. The proposed project will impact approximately 10 acres of SWH. The existing placement sites (Cox Creek and HMI) may have been built in shallow water, but currently are fastland. A maximum of 54 acres of shallow water habitat lies within the proposed site footprints for the BP-Fairfield and Sparrows Point projects. It is expected that if all the sites are developed, this would be a permanent impact to SWH. However, many of the mitigation options being considered are being designed to enhance SWH in the Harbor. This would include substrate improvements to encourage SAV colonization and wetland creation/enhancements which would improve summer flounder habitat in the Patapsco estuary.

Proper management of fishing is the most critical measure to ensure stable summer flounder populations, unless other environmental conditions change substantially. Increased oxygenation of bottom waters could increase the depth to which adult summer flounder could occur in warm weather months.

III.2 Bluefish (juvenile and adult life stages)

III.2.1 Natural History and Fishing Pressure

Juvenile and adult bluefish enter the Chesapeake Bay during spring through summer, leaving the Bay in late fall. Adults are uncommon north of Annapolis, and generally do not occur above the U.S. 50 bridge, except during years of greater up-Bay salt wedge encroachment. Juveniles tolerate lower salinities than adults, and are therefore common in the upper Bay above the U.S. 50 Bridge, occurring as far north of Susquehanna Flats and the lower Elk River (Lippson, 1973). MDNR monitoring data for the Poplar Island area (Table 1) indicate that the area reaches the optimum temperature for bluefish immigration (>68°F, Table 3) in early June and falls to the outmigration temperature (<59°F, Table 3) in late November. Only juvenile bluefish were collected in the vicinity of Masonville and throughout the Harbor (Table 2).

Adults are not typically bottom feeders and are strong swimmers that can easily avoid turbid conditions. Juveniles prefer shallower waters but are expected to be able to avoid dredging and construction activities. Juveniles tend to concentrate in shoal waters, and are opportunistic feeders, foraging on a wide variety of estuarine life in the pelagic zone and over a variety of bottom types (Lippson, 1973). Table 3 provides information on general occurrence and habitat preferences of bluefish in estuaries.

Bluefish supports a commercial and recreational fishery. Large population fluctuations are common (Fahay et al., 1999). Within the Mid-Atlantic Bight, bluefish is one of the most important recreational species and recreational landings historically exceed commercial landings in the region. Its commercial value has increased since the 1960s and 1970s. However, combined landings, which peaked in 1980, declined steadily through the late 1990s (O'Reilly and Austin, 1996 cited in MMS, 2000). As of January 2003, the stock was considered overfished, but overfishing is not currently occurring (MAFMC, 2004).

III.2.2 Impacts Assessment

III.2.2.a Impacts to Individuals Any adults or young that may be in the area during construction would be displaced. However, because of the comparatively small size of the project area in comparison with open waters of the Patapsco estuary and adjacent Bay suitable for bluefish, no detrimental impacts to bluefish are expected. In addition, adult bluefish are relatively rare in the Patapsco estuary and Upper Chesapeake Bay relative to reaches of the Bay south of the Bay Bridge. Juvenile bluefish are common in the Bay mainstem and most of the major tributaries north of the Bay Bridge, depending on annual conditions of salt wedge intrusion into the Bay. In addition, bluefish were uncommon in site-specific fisheries studies (Table 2) and are generally uncommon north of the Bay (William Preston Memorial) Bridge in most years (Nichols 2005). Direct impacts to bluefish are unlikely, even if construction occurs during warmer months, because bluefish are good swimmers and can easily avoid construction activities. During cooler weather months no direct physical impacts to individuals are expected because they are unlikely to be present. Bluefish are unlikely to be present around the project from late October through early May due to their temperature preferences (Packer et al. 1999).

III.2.2.b Habitat Impacts Construction of the DMCF would cause the loss of 126 acres of Bay/river bottom which has only marginal habitat value due to the relatively low salinities, degraded substrates/benthos and poor in-stream habitat features. Habitat restoration in Masonville Cove includes reef habitat structures, which will improve and diversify the in-stream

cover. This is expected to improve utilization of the area by a wide variety of fish species, including predatory species such as bluefish. Bluefish also utilize salt marsh guts (Table 3) and the habitat improvements within the Cove include creation and/or enhancement of tidal wetland, which would also improve bluefish habitat.

III.2.2.c Impacts to Prey The permanent reduction of open water and benthic communities as a result of DMCF development will reduce biomass available for consumption by finfish. However, bluefish are opportunistic feeders and the prey they consume occur over a broad area of the Bay so impact to any individual prey species is expected to be minimal. The reef habitat structures proposed for the Cove will improve in-stream cover which is expected to benefit bluefish prey species. The creation and improvement of tidal marshes within the Cove will also support a wide variety of forage species consumed by bluefish. This is expected to compensate somewhat for conversion of open water and benthic habitats and ultimately be a habitat enhancement for this species. .

III.2.2.d Cumulative Impacts Cumulative effects from other projects discussed in the section on summer flounder impacts should not be significant relative to juvenile or adult bluefish because of the ubiquitous distribution and opportunistic feeding habits of this species within the Bay. Proper management of fishing is the most critical measure to ensure stable bluefish populations. It is anticipated that in the long term, innovative reuses will decrease the need to place dredged material in waterways, which would act as a mitigative measure for minimizing effects to summer flounder and bluefish in the Baltimore Harbor.

IV. FEDERAL AGENCY'S OPINION ON PROJECT IMPACTS TO EFH

In summary:

1. Sub-adult summer flounder and juvenile bluefish and summer flounder known to occur near the project area, although utilization is relatively low. The proposed DMCF will convert up to 120 acres of EFH to fastland for potential terminal expansion. However the area proposed for development is currently degraded due to sediment contamination and the benthic and other forage resources are marginal.
2. The reef structures proposed for the restoration of Masonville Cove (adjacent to the DMCF) will improve and diversify the in-stream cover. This is expected to improve utilization of the area by a wide variety of fish species, including bluefish and summer flounder, but also many of their preferred prey items. Cove improvements also include substrate improvements that will benefit the benthic community and improve summer flounder forage resources in the area. Bluefish and summer flounder are also expected to benefit from the tidal wetland creation and/or enhancements proposed for Masonville Cove.
3. A small area (0.38 acres) of SAV (summer flounder HAPC) will be impacted by DMCF development. In total 10 acres of SWH (Tier I/ Tier II SAV) habitat will be lost within the DMCF footprint. The SAV within Masonville cove will not be impacted as a result of this effort and some improvements within the Cove are designed specifically to promote SAV expansion. The net impact to summer flounder HAPC in the area should

be positive.

4. Some short-term impacts to surface water quality are expected to occur during pre-dredging and dike construction. Elevations in turbidity and nutrients are likely in the vicinity of the dredging operations and there is a potential for the release of some toxics during pre-dredging due to the contaminants in the overburden. The potential for water quality impacts is being investigated further. It is expected that time of year restrictions may be imposed to protect fisheries resources in the area. The dike construction process would also minimize impacts to EFH species. The dike would be raised out of the water and then sealed off from the Patapsco River before raising the dikes to their final height. This would minimize the amount of turbidity reaching the middle branch and therefore minimize the turbidity impacts to EFH species.
5. Discharges from the DMCF will be regulated by a NPDES and subject to compliance with state water quality standards, resulting in only short term, minor perturbation to water quality.
6. Although other federal, state and private sponsored projects occur in the project vicinity that cause the disturbance of bottom habitat, these projects are periodic and should not significantly affect summer flounder or bluefish and their preferred habitats. Two other DMCFs currently exist in the area and up to two more are being considered for management of Harbor materials. This would cause a loss of bottom and open water habitat for these species; however bluefish and summer flounder utilization in this area is low. Therefore, no significant cumulative impacts to habitat or populations of these species are expected to result from this project.
7. Other species with EFH designated in the project area (i.e., red drum, cobia, Spanish mackerel, king mackerel, windowpane flounder) are rare and transient to the site (Nichols, pers. comm., 2003 and 2004, Murdy 1997) and have not been documented in the project area in site-specific studies (USACE 1996, NOAA 2001, EA 2004).

In conclusion, the Baltimore District, after reviewing relevant fisheries information, analyzing potential project impacts has determined that the proposed action (in conjunction with the proposed Cove improvements) will not have a substantial adverse affect on EFH, or on species with designated EFH in the project area. Overall, direct, secondary, and cumulative impacts to EFH and associated species will be minimal and, in the long term, the current project will enhance some habitat features for species managed under the Magnuson-Stevens Act.

V. MITIGATION

Because this proposal will result in minimal impacts to summer flounder and bluefish and is designed to protect and enhance EFH and HAPC, no mitigation specific to protection of populations of these species or their habitat has been proposed. It should also be noted that the proposed project already incorporates numerous mitigation measures that will have a positive impact on the Patapsco estuary. These mitigation measures include creation of reef habitat, which would improve bluefish habitat in the project area, and substrate improvements with SAV seeding, which would improve the benthic community and provide an improved food source for summer flounder.

The dike construction process would minimize impacts to EFH species. The dike would be

raised out of the water and then sealed off from the Patapsco River before raising the dikes to their final height. This would minimize the amount of turbidity reaching the middle branch and therefore minimize the turbidity impacts to EFH species.

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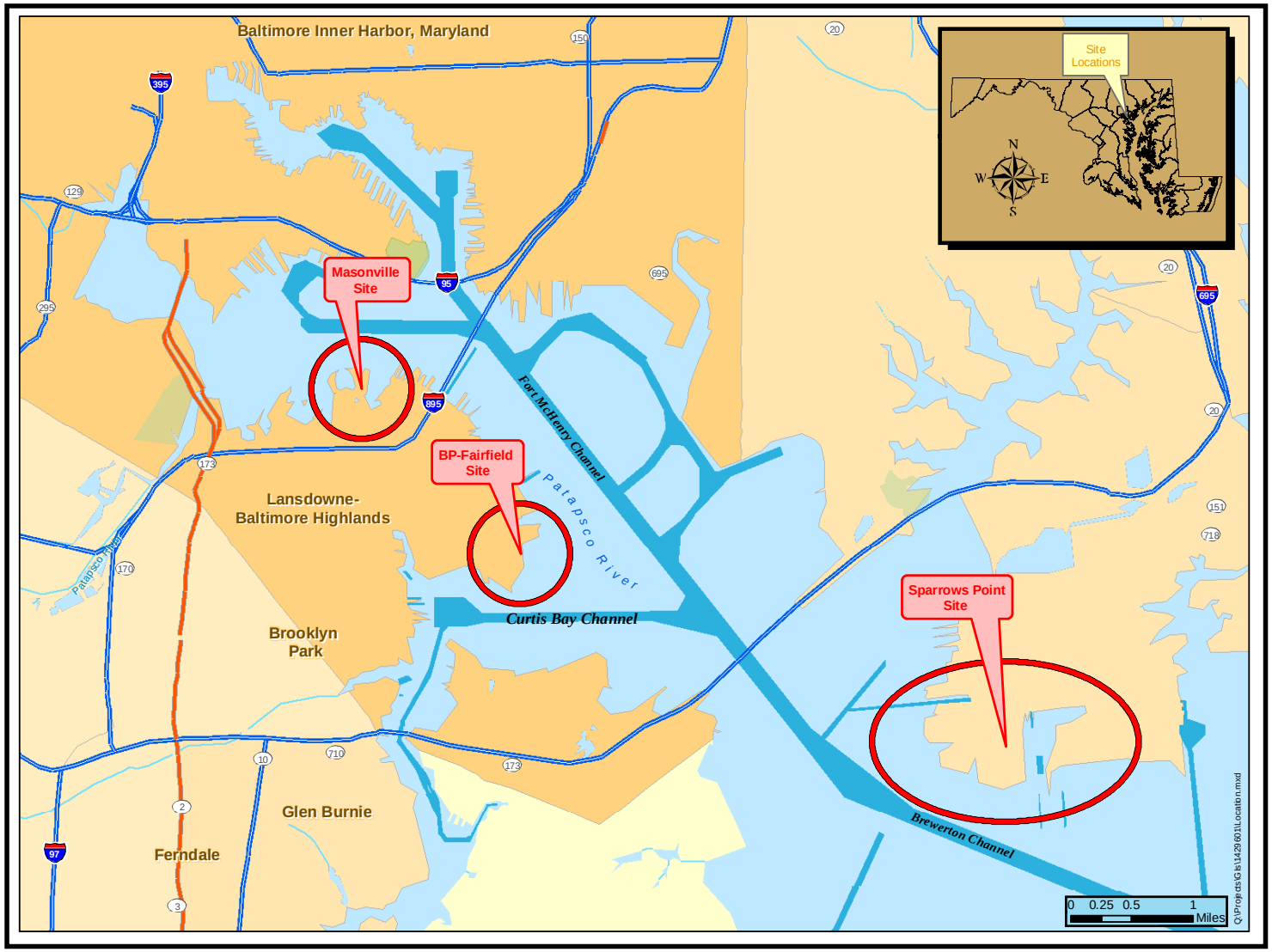

Figure 1. Location of Proposed Dredged Material Containment Facilities

Figure 2. Proposed Masonville DMCF Alignment

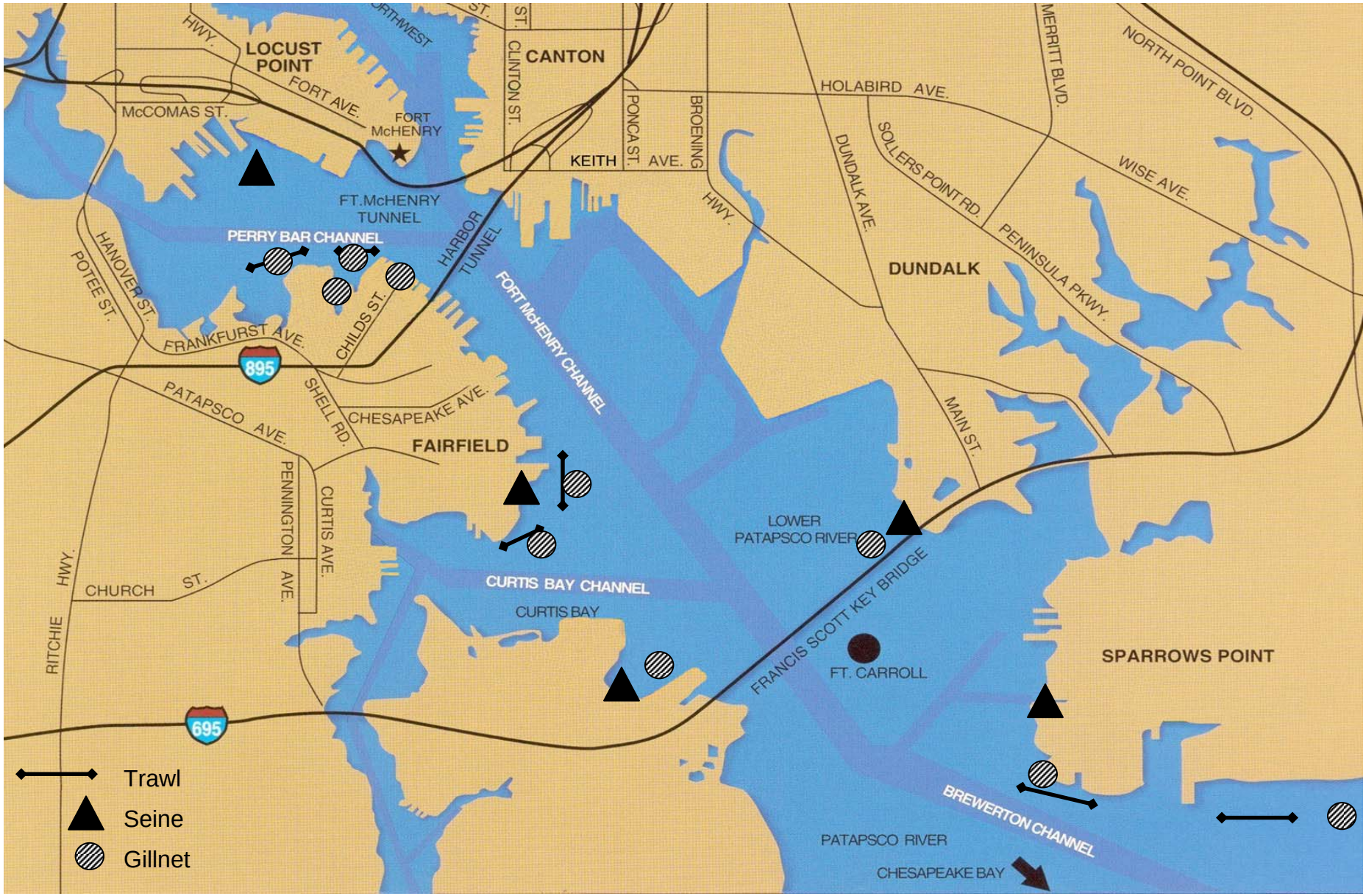

Figure 3. Fisheries Sampling Locations in Baltimore Harbor near Proposed Dredged Material Placement Sites (2003-2005)

Table 2a. Distribution and Abundance of Species of Concern and Prey Species in Baltimore Harbor--Spring Survey

		Site														
		Masonville			BP-Fairfield			Sparrows Point			Thoms Cove**		Sollers Pt**			
		S	T	G *	S	T	G	S	T	G	S	G	S	G	Juv	Adult
Species of Concern	Summer flounder															
	Bluefish												2		2	
	Windowpane flounder															
	Cobia															
	Red drum															
	King mackerel															
	Spanish mackerel															
Prey Species	Atlantic silverside	216			2			25			86		400			
	Bay anchovy		8					18	451							
	Fundulus spp.	60		1	3											
	Atlantic menhaden			407			175			203		88		127		
	Alosa spp.			4			2						1	103		
	Gizzard shad			15		2				2		3		5		
	White perch	137	9	513	57	274	380	378	610	826	20	100	82	354		
	Striped bass	10	4	115	1	8	45	1	4	27	6	31		55		
	Lepomis spp.	4		1				1		1	1					
	Yellow perch			9				1	1	3		1	2			
	Spottail Shiner	5														
	Spot			1						2			2			

Notes: S=Seine; T=Trawl; G=Gillnet Some collections combined by genus; blank cells indicate that no individuals of that genus/species caught.
*Includes Kurt Iron Channel and Wet Basin (sampled by gillnet in 2005); Most sampling conducted in May 2004
**Includes combined total for May 2004 and May 2005 sampling. Details in Masonville EIS.

Table 2b. Distribution and Abundance of Species of Concern and Prey Species in Baltimore Harbor—Summer Surveys

		Site														
		Masonville			BP-Fairfield			Sparrows Point			Thoms Cove**		Sollers Pt**			
		S	T	G *	S	T	G	S	T	G	S	G	S	G	Juv	Adult ***
Species of Concern	Summer flounder						1					1		1	1	2
	Bluefish			7			1			4		18		12	42	
	Windowpane flounder															
	Cobia															
	Red drum															
	King mackerel															
	Spanish mackerel															
Prey Species	Atlantic silverside	224			260			370			1262		107			
	Bay anchovy					1					24					
	Fundulus spp.	3			5											
	Atlantic menhaden	1		172		4	98			201	317	386		120		
	Alosa spp.			1				2		3	9		1			
	Gizzard shad	5		14			5			38		12		58		
	White perch	474	201	635	109	1581	386	276	137	1037	1079	271	180	351		
	Striped bass	878		31	11	16	60	91	1	54	283	64	8	47		
	Lepomis spp.	6						4								
	Yellow perch	4		1				1		1			1			
	Spottail Shiner	39														
	Spot			590			18			6	1	7		406		

Notes: S=Seine; T=Trawl; G=Gillnet Some collections combined by genus; blank cells indicate that no individuals of that genus/species caught.
*Includes Kurt Iron Channel and Wet Basin (sampled by gillnet in 2005); Most sampling conducted in July 2003
**Includes combined total for July 2003 and August 2005 sampling. Details in Masonville EIS.
***Subadults ranging from approximately 220-260 mm

Table 2c. Distribution and Abundance of Species of Concern and Prey Species in Baltimore Harbor—Fall Survey

		Site														
		Masonville			BP-Fairfield			Sparrows Point			Thoms Cove		Sollers Pt			
		S	T	G *	S	T	G	S	T	G	S	G	S	G	Juv	Adult **
Species of Concern	Summer flounder			4		2	2		2	2				2	2	12
	Bluefish			3			3			1		8		1	16	
	Windowpane flounder															
	Cobia															
	Red drum															
	King mackerel															
	Spanish mackerel															
Prey Species	Atlantic silverside	77						48	14		10		9			
	Bay anchovy	658				258			1619		39		24			
	Fundulus spp.	26						5								
	Atlantic menhaden	15		373		2	249		15	579		40		36		
	Alosa spp.			1		2	1		200	3	2					
	Gizzard shad	1		70			46		2	30	2	20	11	35		
	White perch	12	9	526		431	169	140	1917	313	431	273	72	234		
	Striped bass	4	1	85		10	80		9	110	21	29	6	31		
	Lepomis spp.	12														
	Yellow perch							1								
	Spottail Shiner								34							
	Spot			74		18	50		28	77		395		110		

Notes: S=Seine; T=Trawl; G=Gillnet Some collections combined by genus; blank cells indicate that no individuals of that genus/species caught.
*No Kurt Iron Channel or Wet Basin sampling in this season; Sampling conducted in October 2004
Shaded cells not sampled in this season. Details in Masonville EIS.
**Subadults ranging from approximately 220-300 mm; juveniles were less than 170mm.

Table 3. Occurrence and Habitat Preferences of Bony Fish with EFH Designated for Region by Life-Stage in the Mid-Atlantic, with Focus on Preferences Applicable or Potentially Applicable to Estuaries.

Species Common Name	Regulated EFH Life Stages	Geomorphic Features	Substrate	Depth (m)	Depth (ft)	Water Temperature (C)	Water Temperature (F)	Time of Year	Reference
Bluefish	Juvenile	Day: shorelines, tidal guts; night: open waters, channels	Sand, mud, sea lettuce patches, eelgrass beds, salt marshes	--	--	>20 immigrate into estuaries; 15 emigrate from estuaries	>68 immigrate into estuaries; 59 emigrate from estuaries	May - October	Fahay et al., 1999
	Adult	--	--	--	--	>14 to 16	>57 to 61	--	Fahay et al., 1999
Summer flounder	Juvenile	Lower estuary flats, channels, salt marsh guts, eelgrass beds.	Mud and sand	0.5 to 5	1.5 to 15	>11	>52	--	NMFS 2000 (Summary Tables); Packer et al., 1999
	Adult	--	--	0 to 25	0 to 80	--	--	Warmer months	NMFS 2000 (Summary Tables); Packer et al., 1999