APPENDIX E

Endangered Species Act Section 7 Coordination

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

REPLY TO
ATTENTION OF

April 27, 2005

Planning Division

Ms. Mary A. Colligan
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Dear Ms. Colligan:

The purpose of this letter is to supply additional information on the Poplar Island Environmental Restoration Project Expansion Study (PIES) per your letter dated January 22, 2004. The subject letter requested that the U.S. Army Corps of Engineers, Baltimore District (Corps) contact the NOAA Endangered Species Coordinator once project details are developed.

Please find the enclosed endangered species assessment for the PIES . Based on available information, the Baltimore District considers that it is unlikely that shortnose sturgeon, except for a possible occasional transient individual, occur in the project area. The closest shortnose sturgeon caught on the eastern shore as part of the U.S. Fish and Wildlife Service Atlantic Sturgeon Bounty Program was 7.8 miles north of the project area. The closest sturgeon found on the western shore of the Bay was 6 miles away in Herring Bay in a gillnet. 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 construction of the proposed project is not likely to adversely affect shortnose sturgeon.

The District has not seen any data that indicates the presence of sea turtles in the project area and does not believe that the area provides particularly valuable habitat for these species. The area may be occasionally used by transient Loggerhead turtles but there is no data to confirm this. Sea turtles typically avoid hydraulic cutter head dredges. The area has little eel grass which is a desirable habitat for Kemps Ridley turtles. Sea turtles are not known to nest in this part of the Bay. No hopper dredging is performed in this part of the Bay. Consequently, the construction of this project is not likely to adversely affect sea turtles.

We request your concurrence on our findings regarding shortnose sturgeon and sea turtles. If you have any questions regarding this matter or require additional information please contact Mr. Mark Mendelsohn at (410) 962-9499.

Sincerely,

Wesley E. Coleman Jr.
Chief, Civil Project Development Branch

Enclosures

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

AUG 2 2 2005

Wesley E. Coleman, Jr.
Chief, Civil Project Development Branch
Department of the Army
Baltimore District, US Army Corps of Engineers
PO Box 1715
Baltimore, Maryland 21203-1715

Attn: Planning Division/Mark Mendelsohn

Dear Mr. Coleman,

This is in response to your letter received July 27, 2005 regarding the Poplar Island Environmental Restoration Project Expansion. The purpose of the proposed project is to re-create and restore important regional island habitat that has been lost to land subsidence, rising sea level, and erosion in the Chesapeake Bay. The project site is located in the Chesapeake Bay; approximately 39 miles south-southeast of Baltimore Harbor. The Army Corps of Engineers (ACOE) has made the preliminary determination that the proposed project is not likely to adversely affect any threatened and/or endangered species listed under the jurisdiction of NOAA's National Marine Fisheries Service (NMFS) and has requested that NMFS concur with that determination.

As indicated in a letter dated January 22, 2004 from NMFS to the ACOE regarding this project, several species of listed sea turtles and a population of the federally endangered shortnose sturgeon (*Acipenser brevirostrum*) are known to occur in the Chesapeake Bay. Sea turtles are present in the Bay from April 1 through November 30 of any year. These species have been documented throughout Chesapeake Bay and are likely to occur in the waters surrounding Poplar Island, particularly if suitable forage items were present. However, the lack of Submerged Aquatic Vegetation (SAV) at the project site makes this less likely to be a preferred sea turtle foraging area. The distribution of shortnose sturgeon in Chesapeake Bay is not well known due to the lack of successful and comprehensive survey efforts. The majority of data on shortnose sturgeon use of the Bay is a result of the reporting of incidental shortnose sturgeon captures in fishing gear. The nearest reported capture of a shortnose sturgeon to the project site was approximately 8 nautical miles to the west, near Herring Bay, on Maryland's western shore. The nearest collections on the eastern shore were approximately 9 nautical miles north off Kent Island. However, as fisheries-dependent data is driven by the seasonality of the fishery as well as the location of fishing gear and the reporting of captures by fishermen, it is not possible to rely on this data to indicate the exclusion of shortnose sturgeon from a particular area. However, surveys conducted in the waters surrounding Poplar Island in 1994, 1995, 2001, 2003 and 2004 failed to capture any shortnose sturgeon, indicating that this area is not likely a high use area for shortnose sturgeon. This is likely due to the relatively shallow depths that would likely preclude use as an overwintering area and/or a thermal refuge in warmer summer months. Therefore, based on the best available information, the waters surrounding Poplar Island that will be affected by the proposed project are likely only to be used by transient shortnose sturgeon and are not likely to be a shortnose sturgeon concentration area.

Dredged material from the Upper Chesapeake Bay approach channels to the Port of Baltimore is currently being used to restore over 1,140 acres of wetland and upland habitat as part of the initial Poplar Island Restoration Project. The lateral expansion of the Poplar Island Restoration Project as currently proposed would expand the current alignment by 600 acres. This would result in the permanent transformation of 470 acres of open water habitat to island habitat. The first phase of the project would involve dredging of sandy material from a 230-acre borrow area to provide material from which to construct dikes. The second phase would involve the placement of dredged material transported to the site from the Port of Baltimore approach channels within the dikes. It is expected that this project would provide 28 million cubic yards of dredged material placement capacity. During dike construction, turbidity curtain and/or silt fences would be used to minimize any increase in turbidity. A hydraulic (pipeline) dredge will be used to mine the sand needed for dike construction.

Dredging activities have been documented to lethally take threatened and endangered sea turtles; however, these takes have all been with hopper dredges. Sea turtles are able to avoid pipeline dredges, likely because of the slower speeds they are operated at and the lower suction levels compared to hopper dredges. As a pipeline dredge will be used for the dredging project, no direct effects (i.e., injury and/or mortality) to sea turtles are likely. Shortnose sturgeon have been documented to be killed in pipeline dredge operations, however, as indicated above, shortnose sturgeon are not likely to be present in the areas to be dredged. In addition, no sea turtles and/or shortnose sturgeon have been encountered in previous dredging operations at Poplar Island. As such, no direct effects to shortnose sturgeon and/or sea turtles are likely to result from the required dredging operations.

The construction of the dikes and the placement of dredged materials will result in the loss of open water habitat. As indicated above, this area is not likely to be a high use area for sea turtles and/or shortnose sturgeon and as such, the potential loss of this habitat and associated forage items will be insignificant. Suitable habitat and forage is expected to occur in other easily accessible areas and no adverse effects to sea turtles and/or shortnose sturgeon from the project operations are likely. Any increase in turbidity due to dredging and disposal activities is not expected to be long lasting and sea turtles and shortnose sturgeon are expected to be able to avoid any turbid areas or sediment plume. As such, no adverse effects to sea turtles or shortnose sturgeon resulting from increased turbidity are expected. Additionally, the expansion of the Poplar Island Restoration Project is expected to increase the suitability of the area for future SAV growth and the creation of marshes and tidal creeks is expected to increase the availability of a wide variety of forage species.

Based on the analysis above, NMFS concurs with the ACOE's determination that the proposed project is not likely to adversely affect any threatened or endangered species listed under our jurisdiction. Therefore, no further consultation pursuant to section 7 of the ESA is required.

Should project plans change, a new species listed or critical habitat designated, or new information become available that changes the basis for this determination, consultation should be reinitiated. Should you have any questions about these comments, please contact Julie Crocker at (978) 281-9328 ext. 6530.

Sincerely,

for Patricia A. Kurkul
Regional Administrator

Cc: Scida, F/NER3
Williams, GCNE
Nichols, F/NER4

File Code: Sec 7 ACOE Maryland Island Restoration

APPENDIX E – ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

GENERAL REEVALUATION REPORT (GRR) AND
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (SEIS)
FOR THE
POPLAR ISLAND ENVIRONMENTAL RESTORATION PROJECT

CHESAPEAKE BAY, TALBOT COUNTY, MARYLAND

April 2005,
Revised August 2005

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 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.

I. PURPOSE

The purpose of the proposed project is to re-create and restore important regional island habitat that has been lost to land subsidence, rising sea level, and erosion in the Chesapeake Bay, plus provide protection to prevent future loss. In the last 150 years, it has been estimated that 10,500 acres have been lost in the middle-eastern portion of Chesapeake Bay due to erosion and sea-level rise. It is predicted that if no actions are taken most island habitats will be completely eroded and lost to the Bay in the next 10 to 20 years. At the same time, the project will provide for the beneficial use of sediments that are dredged from Bay navigation channels. There currently is a dredged material placement shortfall that will be realized in the next 8 to 10 years. The US Army Corps of Engineers (Corps) Baltimore Harbor and Channels Dredged Material Management Plan (DMMP) identified, evaluated, screened, prioritized, and ultimately optimized placement alternatives resulting in the recommendation of a specific viable plan of action for the placement of dredged materials over the next 20 years. Large island restoration was one of the recommended alternatives of the Draft Baltimore Harbor and Channels Dredged Material

Management Plan and Tiered Environmental Impact Statement (EIS) that recently completed the public review process.

II. DESCRIPTION OF PROPOSED ACTION

The Baltimore District, U.S. Army Corps of Engineers (Corps) 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. To address the predicted dredged material placement capacity shortfall, the Corps and MPA initiated the Poplar Island Environmental Restoration Project (PIERP) Expansion Study (PIES), in order to prepare and Integrated General Reevaluation Report (GRR)/Supplemental Environmental Impact Statement (SEIS). The PIERP is located in the Chesapeake Bay; approximately 39 miles south-southeast of Baltimore Harbor. Dredged material from the Upper Chesapeake Bay approach channels to the Port of Baltimore is being beneficially used to restore over 1,140 acres of wetland and upland habitat (approximately 570 acres of wetlands and 570 acres of uplands), and it is estimated that by 2014 the PIERP will provide up to 40 million cubic yards (mcy) of dredged material placement capacity.

Following the completion of the plan formulation process, in which many expansion options were assessed, a proposal from National Marine Fisheries Service (NMFS) and subsequent discussions with the Environmental Protection Agency (USEPA), Fish and Wildlife Service (USFWS), Maryland Department of Natural Resources (MDNR), the Maryland Port Administration (MPA), and the Maryland Department of the Environment (MDE) led to the development and evaluation of an open water embayment that has been incorporated into the environmentally preferred alternative (Alternative 3), which is detailed below.

A. Alternatives Considered

1. Alternative 1 – 575-acre lateral expansion with 60 percent wetland habitat and 40 percent upland habitat, and a 5-ft vertical expansion of the upland cells of the existing PIERP (Figure 1). Alternative 1 consists of a 575-acre lateral expansion of the existing PIERP to the north and northeast, consisting of approximately 60 percent wetland and 40 percent upland habitat and a vertical expansion component consisting of a 5-foot raising of the upland Cells 2 and 6 of the existing project (Figure 1). Approximately 315 acres of wetlands and approximately 235 acres of uplands, plus a 25-acre tidal gut will be constructed in the lateral expansion as a result of Alternative 1. Alternative 1 will provide an additional 29 mcy of placement capacity. The exterior dikes for the existing upland (Cells 2 and 6) in PIERP are currently authorized to a height of +20 ft MLLW. Alternative 1 includes raising the dikes in these cells to a height of +25 ft MLLW. The exterior dikes would be temporarily raised to +30 ft MLLW to accommodate inflow and subsequent consolidation of the dredged material. After placement of material is complete, the exterior dikes would be lowered to a final height of +25 ft MLLW. The height of the exterior dikes for the upland cells constructed in the lateral expansion would have a final height of +20 ft MLLW. The final upland elevation for the lateral expansion component of this alternative will be +20 ft MLLW.

2. Alternative 2 – 575-acre lateral expansion with 50 percent wetland habitat and 50 percent upland habitat, and a 5-ft vertical expansion of the upland cells of the existing PIERP (Figure 2). Alternative 2 consists of a 575-acre lateral expansion of the existing PIERP to the north and northeast, consisting of approximately 50 percent wetland and 50 percent upland habitat and a vertical expansion component consisting of a 5-foot raising of upland Cells 2 and 6 of the existing project. Approximately 275 acres of wetlands and approximately 275 acres of uplands, plus a 25-acre tidal gut will be constructed in the lateral expansion as a result of Alternative 2. Alternative 2 will provide an additional 30 mcy of placement capacity. Similar to Alternative 1, the exterior dikes for the existing upland (Cells 2 and 6) in PIERP are currently authorized to a height of +20 ft MLLW. Alternative 2 would also include raising the dikes in these cells to a height of +25 ft MLLW. The exterior dikes would be temporarily raised to +30 ft MLLW to accommodate inflow and subsequent consolidation of the dredged material. After placement of material is complete, the exterior dikes would be lowered to a final height of +25 ft MLLW. The height of the exterior dikes for the upland cells constructed in the lateral expansion would have a final height of +20 ft MLLW. The final upland elevation for the lateral expansion component of this alternative will be +20 ft MLLW.

3. Alternative 3 (Environmentally Preferred Alternative) – 575-acre lateral expansion with 29 percent wetland habitat, 47 percent upland habitat, and 24 percent open water habitat, and a 5-ft vertical expansion of the upland cells of the existing PIERP (Figure 3). Alternative 3 integrates an open-water embayment into the northern lateral expansion. Based upon coordination and consultation with various resource agencies (USEPA, USFWS, NMFS, MPA, MDNR, and MDE) the open-water embayment could potentially range between 90 to 140 acres in size. However, for the purposes of the impacts assessment for this document, the size of the open-water embayment within the proposed northern lateral expansion is estimated at 130 acres in size. The exact size (acreage) of the open-water embayment will be determined during subsequent design phases of the project.

4. No-Action Alternative. The no-action alternative discusses impacts to existing conditions if the proposed northern lateral expansion and the raising of existing upland cells is not approved. Evaluation of the no-action alternative includes impacts associated the existing PIERP, which has not yet been completed, to the authorized configuration of 1,140 acres in size, with 570 acres of upland habitat and 570 acres of wetland habitat. Remaining activities associated with the existing PIERP include site operations, dredged material inflow, crust management, and habitat development.

B. Project area description

Island habitats are being lost in Chesapeake Bay as a consequence of erosion and inundation accompanying rising sea level occurring at a rate more rapidly than new islands are being created (Wray et al., 1995). Land losses occur Bay wide but are concentrated in the low-lying lower Eastern Shore (USACE, 1990).

Estuarine habitat is impacted in the Chesapeake Bay and throughout the mid-Atlantic by anthropogenic nutrient pollution that degrades water quality (USEPA, 1998). Resultant phytoplankton blooms, concomitant with loss of historic oyster populations that formerly filtered algae and suspended sediment from the water column (Ott and Newell, 1999), prevents submerged aquatic vegetation (SAV) from occupying otherwise suitable habitat. These stresses have presumably reduced the carrying capacity of mid-Atlantic estuaries for finfish (USEPA, 1998).

The MDNR Water Quality Monitoring Program has been routinely sampling year-round in the Chesapeake Bay since 1985. They maintain two mid-channel stations in close proximity to Poplar Island that are suitable for characterizing surface water temperatures at Poplar Island: CB4.1C located to the north of Poplar Island southwest of Kent Point, and CB4.2C located to the south of Poplar southwest of Tilghman Island. Table 1 presents water surface water temperature recorded at these stations for the period 1985-2003 (MDNR, 2005).

The pycnocline, the mixing zone at the boundary between the upper fresher layer of the water column and the lower saltier layer of the water column during times when the water column is stratified, occurs at about 6 to 12 m depth in mid Bay waters (Kemp *et al*., 1999). Subpycnocline waters are prone to hypoxic and anoxic conditions during warm weather months (Chesapeake Bay Program, 2004).

The surficial substrate surrounding the Poplar Island archipelago is predominantly sand and fine sand (USACE/MPA 1996), consistent with the character of much of the middle and lower Bay bottom in Maryland along both the Eastern and Western Shore out to about 30 ft depth (Kerhin *et al*., 1988). Geotechnical investigations conducted for PIES have determined that subsurface geological sand deposits suitable for dike construction extend locally to as deep as about -25 ft MLLW in the proposed southwestern borrow area. Soft (non-compact) clays and silts of 10 ft or more thickness underlie this sand deposit.

No SAV was documented to be present within the proposed northern alignment in Virginia Institute of Marine Science (VIMS) annual surveys conducted from 1992 through 2003 (VIMS SAV surveys conducted prior to 1992 were not reviewed for this assessment). SAV was documented to be present in Poplar Harbor (the harbor lies outside of the impact area of the proposed northeast expansion and southwestern borrow areas) by VIMS in 2001, and by the USFWS in 2001 through 2004 (USFWS, 2001; USFWS, 2003; USFWS 2004). The proposed southwestern borrow area is partially included in the Horseshoe Point USGS 7.5 minute quadrangle that has been regularly surveyed by VIMS for SAV since 1984. The southern portion of the proposed southwestern borrow area is not contained within a named 7.5 minute topographic quadrangle because no land occurs there; this region of open water is not regularly surveyed by VIMS for SAV. No SAV was documented to occur within the Horseshoe Point portion of the proposed southwestern borrow area in SAV surveying conducted by VIMS from 1992 through 2003. Mean Secchi depth in open water mid-Bay stations in the vicinity of Poplar from 1985 to 2003 ranged from 1.1 to 2.0 m during the year, with Secchi depth during the warm weather months lying at the lower end of that range (MDNR, 2005). Consequently, it is unlikely that SAV could survive in the proposed southwestern borrow area because water depths exceed the Secchi depth for the area. Shallow water habitat less than 2 m deep in the area is considered to be habitat that SAV could potentially reoccupy if water clarity improves. Unvegetated shallows less than 1 m deep are considered to be areas of high potential for SAV recovery, and are included in the Tier II SAV recovery zone of the Chesapeake Bay Program (CBP). Unvegetated shallows between 1 and 2 m deep are contained in the Tier III recovery zone.

Table 1. Surface water temperature (ºF) from 1985-2003 at monitoring stations in the Vicinity of Poplar Island

Month	Chesapeake Bay Mainstem / Kent Point (SW) (CB4.1C)			Chesapeake Bay Mainstem / MD Mid Bay (CB4.2C)		
	Minimum	Mean	Maximum	Minimum	Mean	Maximum
January	32	37	42	33	37	42
February	32	35	41	32	35	41
March	36	40	46	36	39	45
April	46	50	57	47	51	56
May	58	60	67	58	60	67
June	67	71	77	65	70	76
July	76	79	82	77	79	82
August	78	80	82	77	80	82
September	72	75	81	72	75	80
October	63	66	70	63	66	69
November	49	54	60	49	54	61
December	39	43	53	39	44	53

C. Shortnose sturgeon (*Acipenser brevirostrum*)

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). 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, or 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 over fishing, loss of habitat, and spawning impediments such as the Conowingo Dam have contributed to their decline or extirpation. At present, the continued existence of SNS in the Chesapeake Bay remains uncertain. However, genetic assessments of the SNS, captured from the Reward Program, in the Chesapeake Bay have indicated that those 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.

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 shortnose sturgeon data provided by the USFWS from the reward program has indicated that 68 shortnose sturgeon have been captured, but no shortnose sturgeon has been captured in the vicinity of the PIERP site through June 5, 2005. SNS caught in the vicinity of Poplar Island (Mid-Bay region below the Bay Bridge) are depicted by catch method in Figure 4.

Of the 68 SNS captured from 1996 to 2005 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, 35 SNS captures were made north of the Bay Bridge, and the remaining 18 shortnose sturgeon 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 south of the Bay Bridge (latitude 39˚00’00’’) occurred in January through June (spring and early summer). This may be an affect of spring freshwater discharge and the associated depression of salinity with distance down bay with SNS preference for lower salinity waters.

Length data from the Reward Program captures indicates 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 1999). Thus, it is probable that the Howell 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.

No SNS were captured in the waters immediately surrounding PIERP in the Reward Program as of June 5, 2005. Although the waters around Poplar are actively fished, the nearest SNS catch was approximately 9 miles to the west of Poplar Island near Herring Bay and was caught with a gillnet on 2 January 2000 (Figure 4). The nearest collections (2 SNS collections) on the eastern shore were approximately eight miles and 15 miles north of the PIERP, off Kent Island in a pound net (Figure 4). Baseline fisheries monitoring was performed at the PIERP site in 1994-1995 and again for the potential expansion in 2004 (EA 2005). Seasonal monitoring of ichthyoplankton in 1994-1995 showed an increasing trend of juvenile, eggs, and larvae collected in spring and summer months (EA 2002). Sampling was also conducted by NOAA in fall 2001 and spring 2003 utilizing gillnets and bottom trawls, throw traps, and crab pots to collect nekton in proximal waters of PIERP. Gillnets were set during the evening for 12 to 14 hours in Poplar Harbor, near created fishing reefs at the northern end of the site, and reference sites. Together, a total of 11 species were collected by gillnet in 2001 and 9 species were collected in 2003. Trawls were pulled for approximately 656 ft at these locations and yielded a maximum of 12 species of fish and 5 decapod species over the two surveys. Throw traps were used to collect nekton samples in shallow areas containing SAV (MES 2002a). Crab pots yielded only blue crabs (*Callinectes sapidus*). Seasonal sampling around the existing PIERP and in the proposed expansion area was conducted over 3 seasons in 2004 by gillnet, beach seine and bottom (otter) trawl, following the study design of the 1994-95 surveys. Fourteen recreationally or commercially important species were collected during these efforts. No SNS were observed during the 1994-1995 baseline survey, the NOAA 2001 and 2003 surveys or the PIES 2004 seasonal surveys.

D. 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 project area. 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 Muscik 1985, Byles 1988, CBP 2005). Loggerheads and Kemp's ridleys immigrate into Chesapeake Bay in late May or early June once water temperatures warm and emigrate in September and October (Lutcavage and Musick 1985; Byles 1988; Keinath et al. 1994) (See Table 1). 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 horseshore 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).

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 5). The remaining 185 were reported from the Maryland portion of the Atlantic Coast and the coastal bays. Strandings of all four federally listed species have been reported, leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempii*), and green (*Chelonia mydas*). Strandings have occurred throughout the Chesapeake Bay from Tangier Sound to the mouth of Back River (Figure 5), 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% of all stranding (n=112 turtles). Of the remaining strandings, 6% were leatherback (n=6), 3% were Kemp's ridley (n=3), and less than 1% (n=1) were unknown. No green sea turtles have been reported in Chesapeake Bay (Kimmel 2004), although one was found along the

Table 2. Sea Turtle Strandings in Chesapeake Bay, 1991-2003 (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**

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. In 1993, a loggerhead was stranded on one of the Poplar Island remnants (Evans *et al*., 1997).

Table 3. Monthly distribution of sea turtle captures by species in Maryland's Chesapeake Bay (Kimmel, 2004)

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 5. Figure 6 identifies the location of participating pound nets from 2001 through 2003.

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

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

This 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, incidentally captured near Hoopers Island in 2001, had originally been tagged on July 23, 1992, on Melbourne Beach, Brevard County, Florida, a distance of roughly 1500 km, by the University of Central Florida (Kimmel, 2004).

III. IMPACTS 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. 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. Although the risk of entrainment of SNS that might be in the construction area during construction and during hydraulic dredging for dike creation exists, this is a minor risk as no SNS have been reported in the project area. Additionally, construction of the sand dikes for the 1,140-acre PIERP did not encounter or impact any SNS.

Although the waters around the PIERP are actively commercially harvested (by pound net and gillnet) no SNS have been captured in the vicinity of the PIERP site as part of the Reward Program (through January 13, 2005). The nearest SNS catch was approximately 9.2 miles (8 nautical miles) to the west of PIERP near Herring bay and was caught with a gillnet. This site was not sampled as part of the USFWS/USACE sturgeon study. No SNS were captured near the PEIRP during any of the site-specific studies conducted in the area since 1995, and no takes of SNS occurred during PEIRP site construction. Informal consultations with NMFS have indicated that the agency considers SNS present within the Chesapeake Bay (Nichols, NMFS, 2004). The sparse collections of SNS in this area of the Bay as well as the lack of SNS collections in the immediate vicinity of the PIERP indicated that SNS are only likely to be transient to the area. Therefore, no impacts to this species are anticipated from the lateral expansion.

2. Impacts to habitat

The lateral expansion of PIERP would result in the permanent transformation of a maximum of 470 additional acres of open water habitat to island habitat.

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, 1999). 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). This temperature range occurs from April to August in waters surrounding PIERP (Table 1). Maximum water depths within the proposed PIERP footprint are -14'. The maximum depth within the access channel footprint is 25'. The area surrounding PIERP may serve as foraging habitat, but similar habitat is available in the adjacent vicinity. Fisheries studies in the vicinity of the PIERP and expansion area have not collected any species that would be indicative of unique habitats relative to those available within the middle reach of the Chesapeake Bay. Therefore, the proposed expansion area is not likely to be provided 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 7 to 17 ppt. Most mainstem areas north of the Bay Bridge are considered potential over-wintering habitat and as such, the PIERP region is not expected to be over-wintering habitat for SNS. 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 (10 to 20 m) deep] in freshwater rivers (Pottle and Dadswell, 1979).

Water quality impacts due to construction are expected to be short-term and minor. During perimeter dike construction at Poplar, the toe dike would be constructed first to minimize turbidity plumes resulting from dredging associated with the sand borrow activities and placement of sand to construct the dikes. Dredged material transported to the PIERP site would be contained within the armored dikes. Discharges through the spillways would be monitored, and must meet State water quality standards. It is expected that a State of Maryland water quality certification and a wetlands license would be obtained. Turbidity and TSS limits would be prescribed in these documents. To address the potential for toxic metal production upland soil/sediment the PIERP project site would be managed and conditioned periodically if necessary to maintain the pH near neutral. Where determined necessary, time of year restrictions, best management practices (BMPs), turbidity curtains, and silt fences would be used to minimize impacts. An extensive monitoring plan, such as the one used at the existing PIERP, 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 470 acres of open water habitat at PIERP that supports 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 in both locations. The reduction of benthic communities as a result of island expansion would reduce biomass available for consumption by SNS that may use these areas as feeding grounds. However, SNS prey occur over a broad area of the Bay. And 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 mid-Chesapeake Bay region. Creation of salt marsh at Poplar and expected growth of SAV will support a wide variety of SNS forage species and partially compensate for the loss of open water habitat and disturbance to bottom habitats. The PIERP access channel will likely recover a benthic community comparable to pre-project conditions within several years following cessation of dredging, as is typical of benthos occurring on sands and fine mobile estuarine deposits (Newell *et al*., 1998). However, access channel depths below the pyncocline following dredging have the potential to lose their benthic macroinvertebrate communities in the future if hypoxic or anoxic conditions occur for prolonged periods of time. In addition, the open-water embayment proposed as part of Alternative 3 should compensate for the loss of open water habitat and disturbance to bottom habitat because no dredged material would be placed in the open water embayment, thus preserving the existing substrate, benthic community, and natural bathymetry. Therefore, up to 130 acres of bottom habitat would not be directly or adversely impacted, but would be protected within an open water embayment with stone breakwater structures. In addition, the habitat in the created wetland cells will export both detritus and micronutrients via the tributaries and tidal guts into the open-water embayment, thus enhancing the existing benthic community within the open-water embayment. Because 130 acres of open water will be conserved and not disturbed as part of the northern lateral expansion, it is expected that the existing benthic community (which is currently dominated by a single species of suspension feeder) will eventually become both more stable and more diverse as a result of the detritus inputs from the adjacent wetlands cells.

4. Cumulative impacts

Other dredging and placement actions occur in the immediate vicinity of the project area. Periodic maintenance dredging is conducted in small navigation channels including: Knapps Narrows, the Honga River, and the Chester River. Maintenance dredging of the Federal channels in these locations would result in displacement of SNS and forage resources immediately after dredging. Knapps Narrows was last dredged 4 to 5 years ago, and it is expected that maintenance dredging will occur in either 2005 or 2006. The Chester River has been maintained within the past 3 years and would not require dredging for several years. The Honga River dredging and channel realignment was conducted and completed earlier in 2004. However, Honga River channels will require periodic future dredging that will provide material for the proposed wetland creation at Barren Island. These dredging projects will cause only temporary bottom disturbance and loss of benthos that could serve as forage for SNS. There are also periodic maintenance dredging and placement activities associated with other portions of the Baltimore Harbor and Channels federal project in the Patapsco River, the Swan Point Channel, Tolchester Channel, and the approach channels to the Chesapeake & Delaware Canal.

The State of Maryland and Baltimore District are currently evaluating the proposed 2,072-acre fill area that would be subdivided to provide approximately 55% tidal wetland habitats and 45% upland island habitats on James Island and proposed near-shore sills. At Barren Island, the proposed island habitat would consume 12.6 acres of shallow water habitat. Approximately, 20.4 and 67.8 acres of fringe wetland habitat (88.2 acres total) would be created by backfilling on the north and west, respectively. Barren and James Islands are within 16 to 26 nautical miles of PIERP.

B. Sea turtles

1. Impacts to individuals

A hydraulic dredge would be used to mine the sand needed for dike construction at PIERP. There is potential for entrainment of sea turtles that might be in the construction area during use of hydraulic dredges for dike creation, specifically Kemp's ridleys and loggerheads that feed on mollusks and crustaceans. Entrainment risk during construction is the same type of risk that exists during hydraulic dredging. Construction of the sand dikes for the existing 1,100-acre PIERP did not encounter or impact any sea turtles. Additionally, 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. Fifty-five sea turtle incidental takes, mostly loggerheads, have been reported in Virginia waters since 1994. (The period of record is 1980 to the present.) Incidental takes in Virginia occurred between April through November.

Although direct monitoring was not performed, there were no sea turtles identified in any of the finfish surveys or wildlife monitoring during the 1994-1995 baseline surveys, the NOAA 2001 and 2003 fisheries surveys or the PIES 2004 seasonal surveys. Sea turtles are migratory individuals that are seasonal transients to the project area and no impacts are expected directly to individuals. During cooler weather months, particularly, no direct physical impacts to individuals are expected because they are unlikely to be present.

2. Impacts to habitat

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 PIERP that is to be transformed into island habitat would be permanently loss to sea turtles. However, because of the great abundance of this habitat type in the Bay, no detrimental impacts to sea turtle populations are expected.

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 crabbing occurs in the vicinity of the PIERP, mollusk resources within the expansion area are not expected to be particularly abundant due to the lack of SAV and the low densities of clam resources found during 2004 seasonal surveys (EA, 2005). Clam surveys identified minimal soft-shell clam and razor clam population in the waters surrounding the PIERP and the project lies outside the natural range for hard clams, which prefer higher salinities.

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 minimizes sea turtle exposure to proposed project activities.

IV. FEDERAL AGENCY'S OPINION ON PROJECT IMPACTS

In summary:

1. Shortnose sturgeon, and Kemp's ridleys, loggerhead, green and leatherback sea turtles are known to occur near the project area, but have not been shown to utilize the open water immediately around the PIERP. Kemp's ridleys and loggerheads are the two species most frequently identified in Maryland Chesapeake Bay waters. The proposed project would convert up to 470 additional acres of open water at Poplar Island to tidal wetlands and upland island habitat, resulting in a net loss of potential SAV habitat for. However, the proposed project will have long-term, positive impacts to SAV growth in Poplar Harbor by increasing quiescent conditions within the Harbor. The northern alignment was designed specifically to protect Poplar Harbor and the existing SAV and Tier I/II habitat from wind and waves from the northeast. The elimination/reduction of suspended solids, from turbidity caused by wave action, is expected to enhance the suitability of the area for future SAV growth.

2. There is the potential for sea turtles and shortnose sturgeon to be in the project area and be directly impacted by construction operations because these species have been identified in similar habitats in the region. However, the potential for direct impacts are anticipated to be minimal due to the fact that no SNS 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. Additionally, both SNS and sea turtle regional presence is greatest in the spring and summer and much reduced in winter months. Construction equipment is unlikely to entrain SNS or sea turtles. A Hopper dredge will not be used.

3. Fisheries investigations in the vicinity of the PIERP and in the expansion area have not identified rare or unique aquatic habitats or critical habitat for SNS or sea turtles. Conversely,

the open waters of the proposed expansion area that will be impacted from the proposed action are regionally abundant within the middle reaches of the Chesapeake Bay.

4. The marshes and tidal creeks created as part of island creation at the existing PIERP and in the proposed expansion area will support a wide variety of forage species. The creation of this habitat is expected to compensate somewhat for loss of open water and benthic habitats.

5. Hydraulic dredging would be used to dredge sand from the island footprint and from the access channel for the Poplar Expansion. Hydraulic dredging has a smaller risk of sea turtle and SNS capture than Hopper dredging and therefore, further minimizes the potential to directly impact individual sea turtles and SNS. No SNS or sea turtles were encountered during hydraulic dredge construction of the existing PIERP dikes.

6. Discharges from the new placement cells will be subject to compliance with state water quality standards, resulting in only short term, minor perturbation to water quality.

7. 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 are not likely to have an adverse affect on SNS, sea turtles, and their respective habitat. Proposed large-scale island restoration projects would cause a loss of bottom and open water habitat for these species, however natural expansion of the Bay would likely replace these habitats regionally within about a decade. Therefore, the proposed project is not likely to have adverse cumulative impacts to habitat or populations of these species are expected to result from this project.

In conclusion, the Baltimore District, after reviewing relevant fisheries information and analyzing potential project impacts, has determined that the proposed action will not have a substantial adverse affect on shortnose sturgeon or sea turtles or their habitat or prey in the project area.

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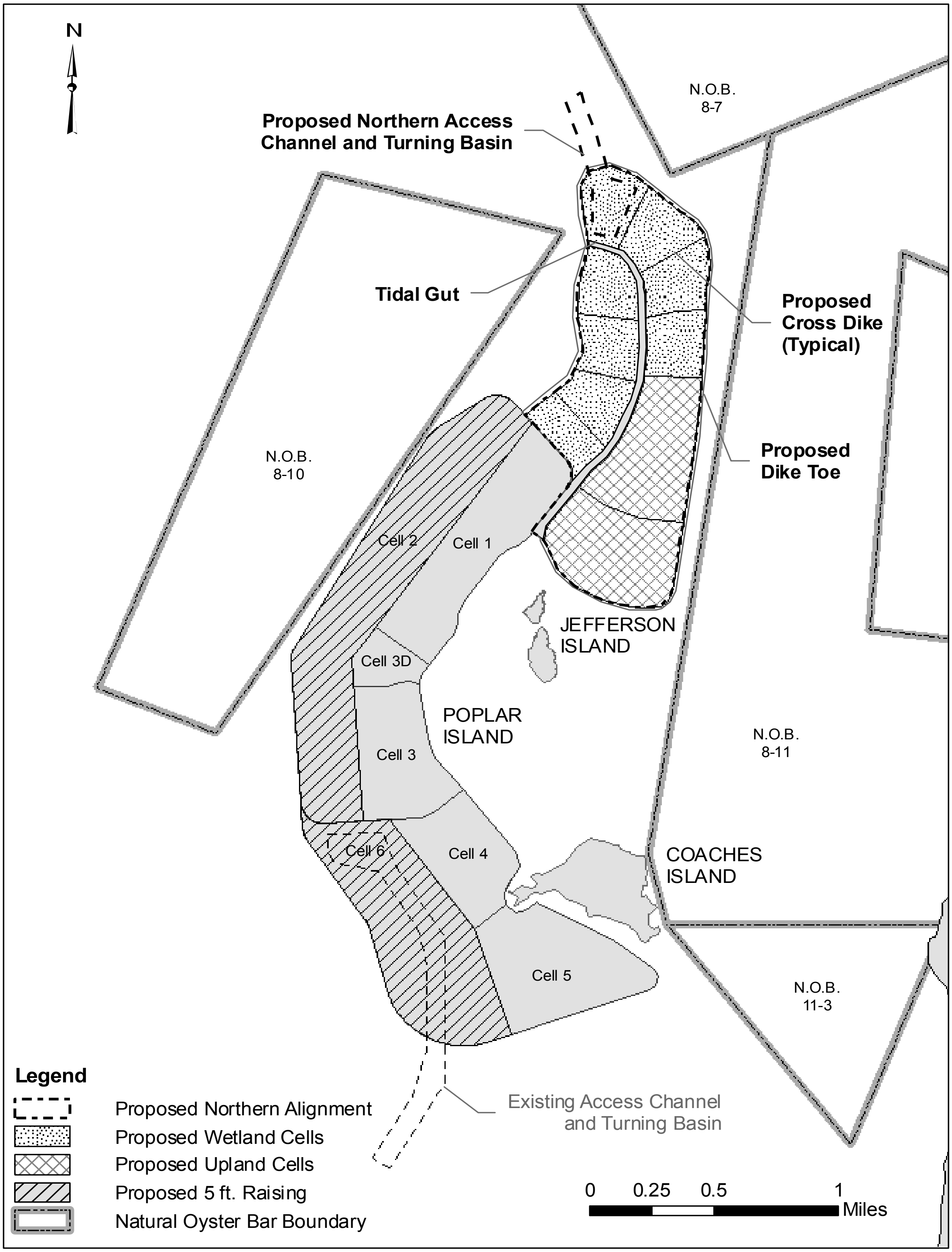

Figure 1. Alternative 1 (60% Wetland to 40% Upland Ratio and 5 ft. Raising of PIERP Upland Cells)

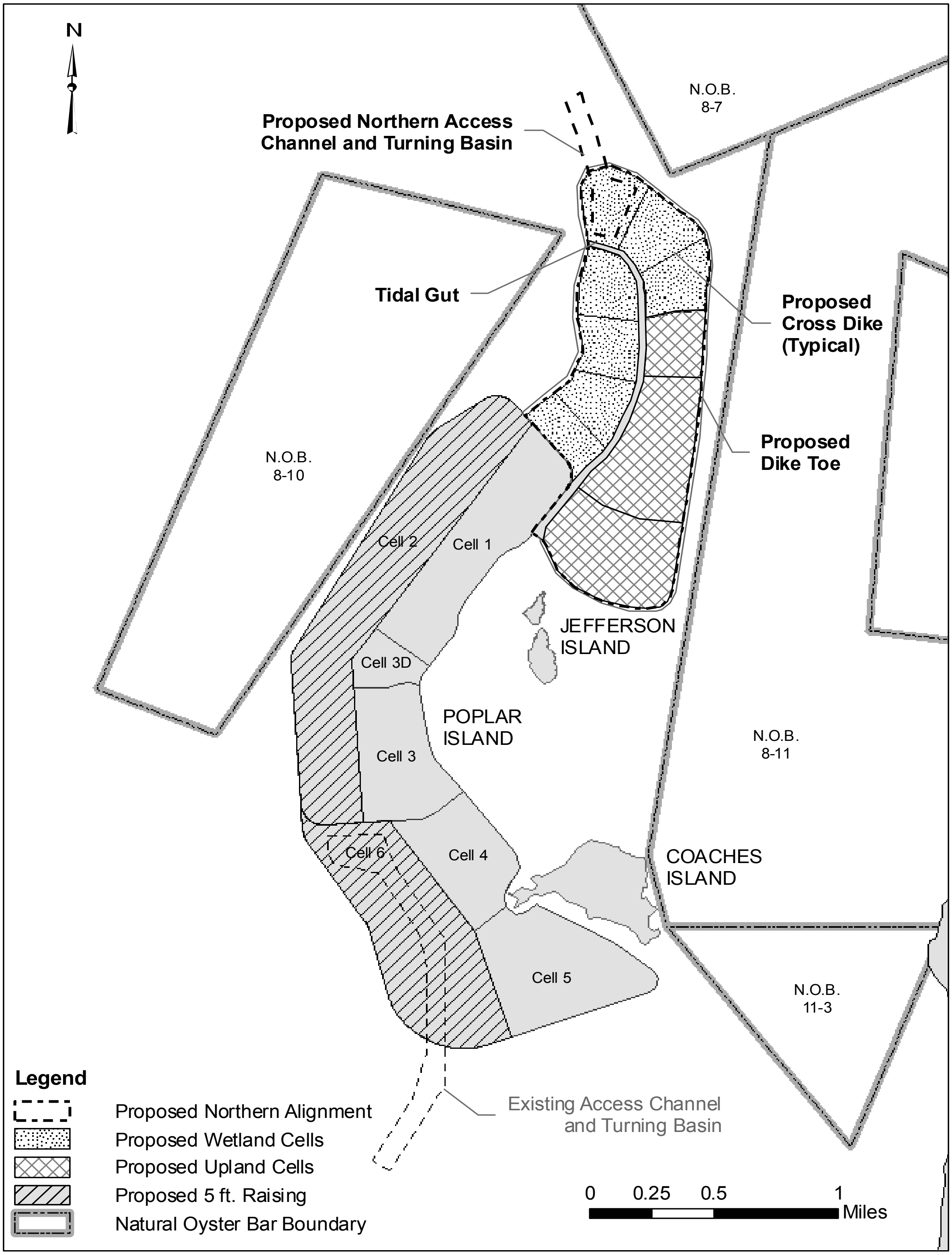

Figure 2. Alternative 2 (50% Wetland to 50% Upland Ratio and 5 ft. Raising of PIERP Upland Cells)

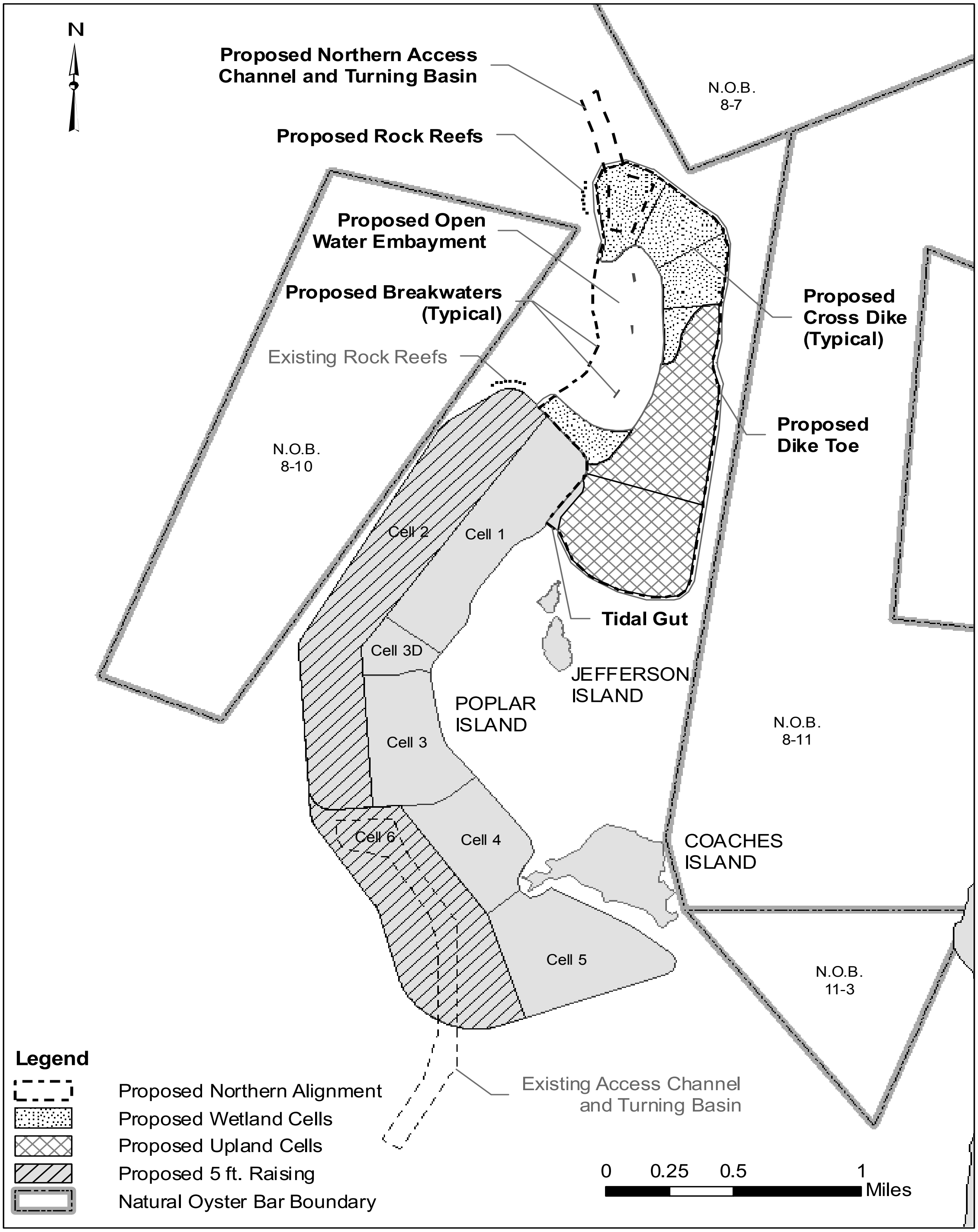

Figure 3. Environmentally Preferred Alternative (Alternative 3) - 29% Wetland, 47% Upland, and 24% Open Water and 5-ft Raising of PIERP Upland Cells

Figure 4. Shortnose Sturgeon Reward Program Catches in the Vicinity of Poplar Island

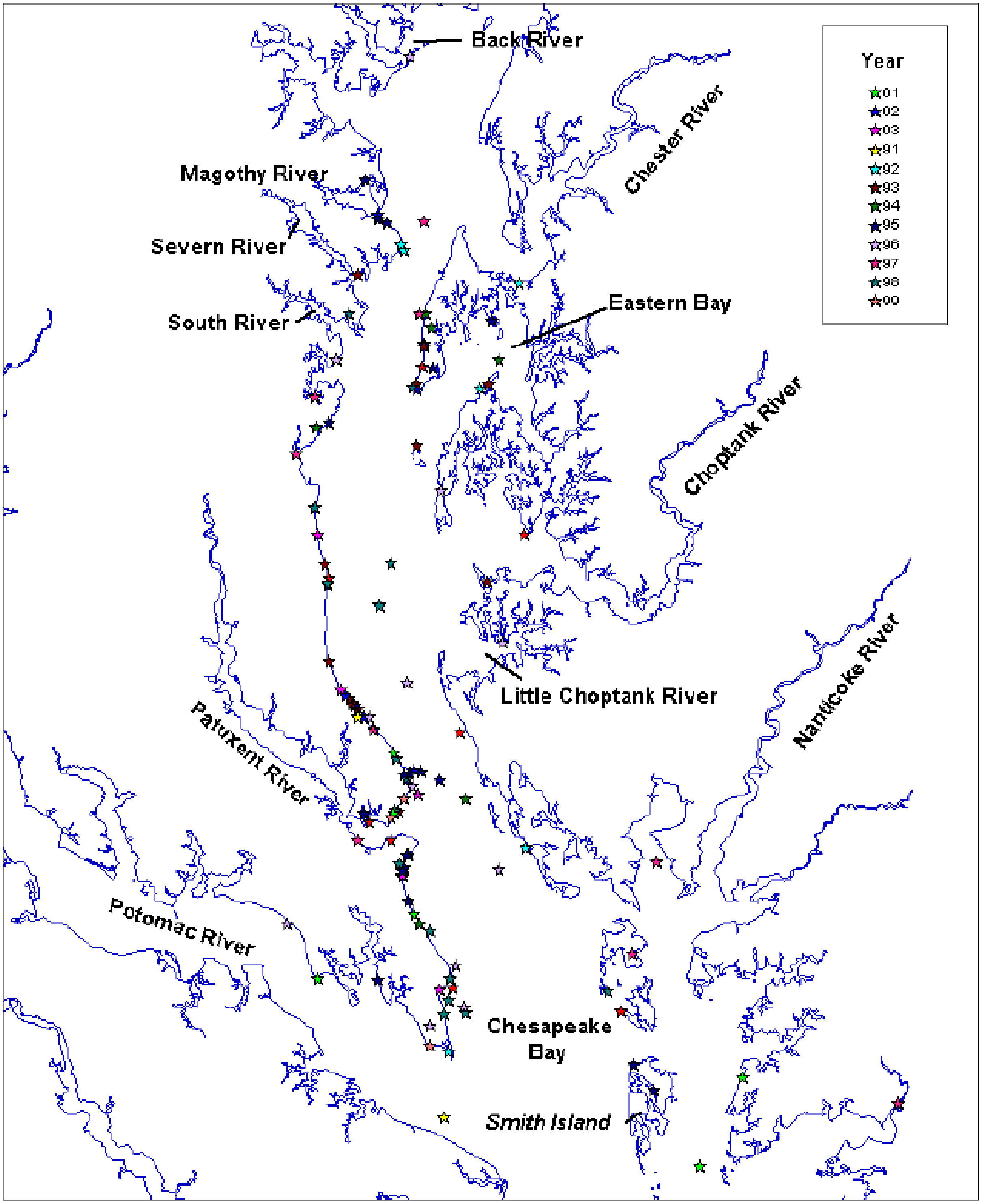

Figure 5. Locations of Sea Turtle Strandings in Maryland Portion of the Chesapeake Bay 1991 to 2003. See text for details (Kimmel, 2004)

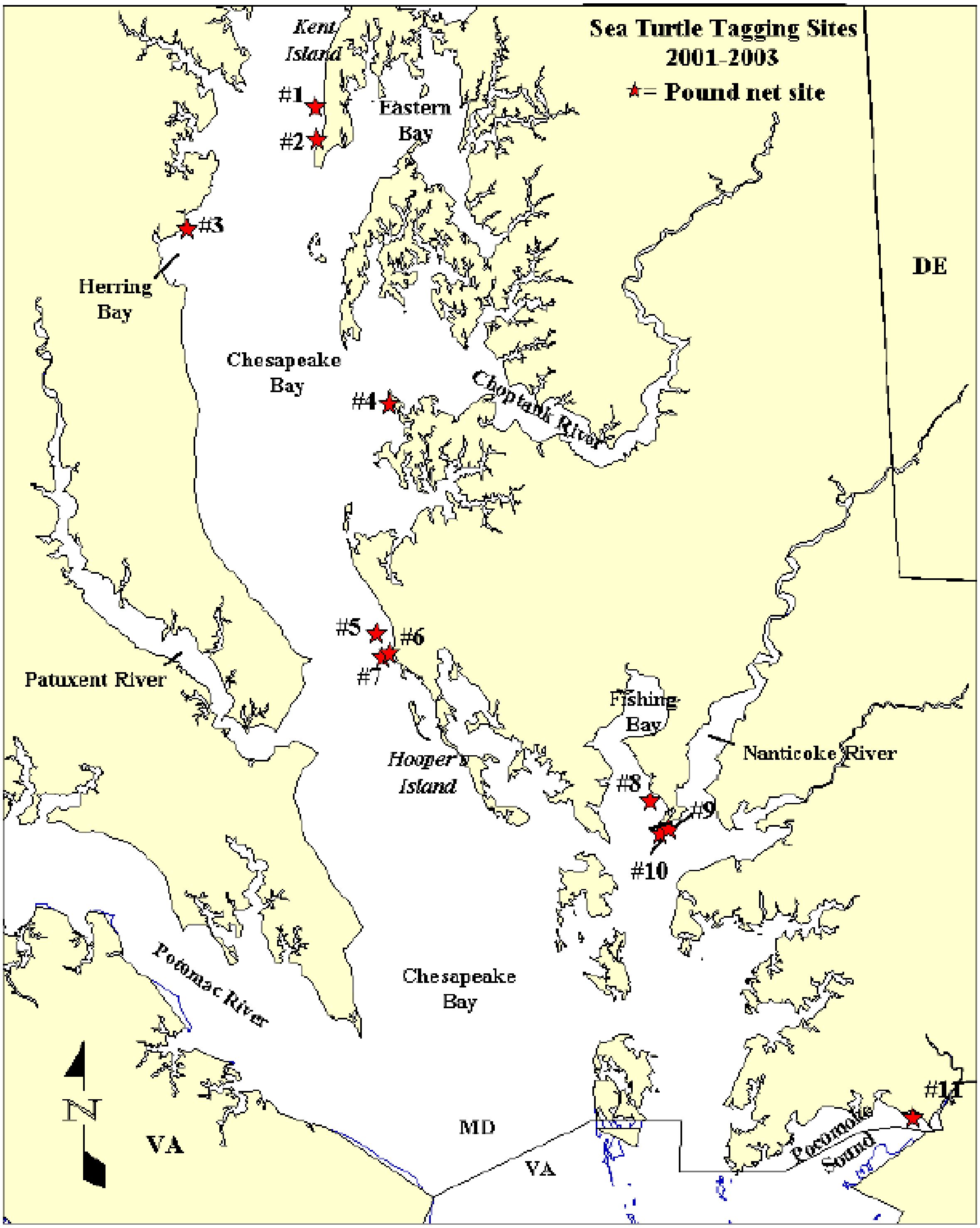

Figure 6. Pound net sites in the Chesapeake Bay in which Incidentally captured Sea Turtles were Examined and Tagged, 2001 to 2003. See Table 2 for details. (Kimmel, 2004)