

Environmental Sensitivity Index Maps

A Guide to Coastal Resources at Risk to Spilled Oil

Chesapeake Bay: Volume 5 Lower Potomac River



Office of Response and Restoration

September 2016

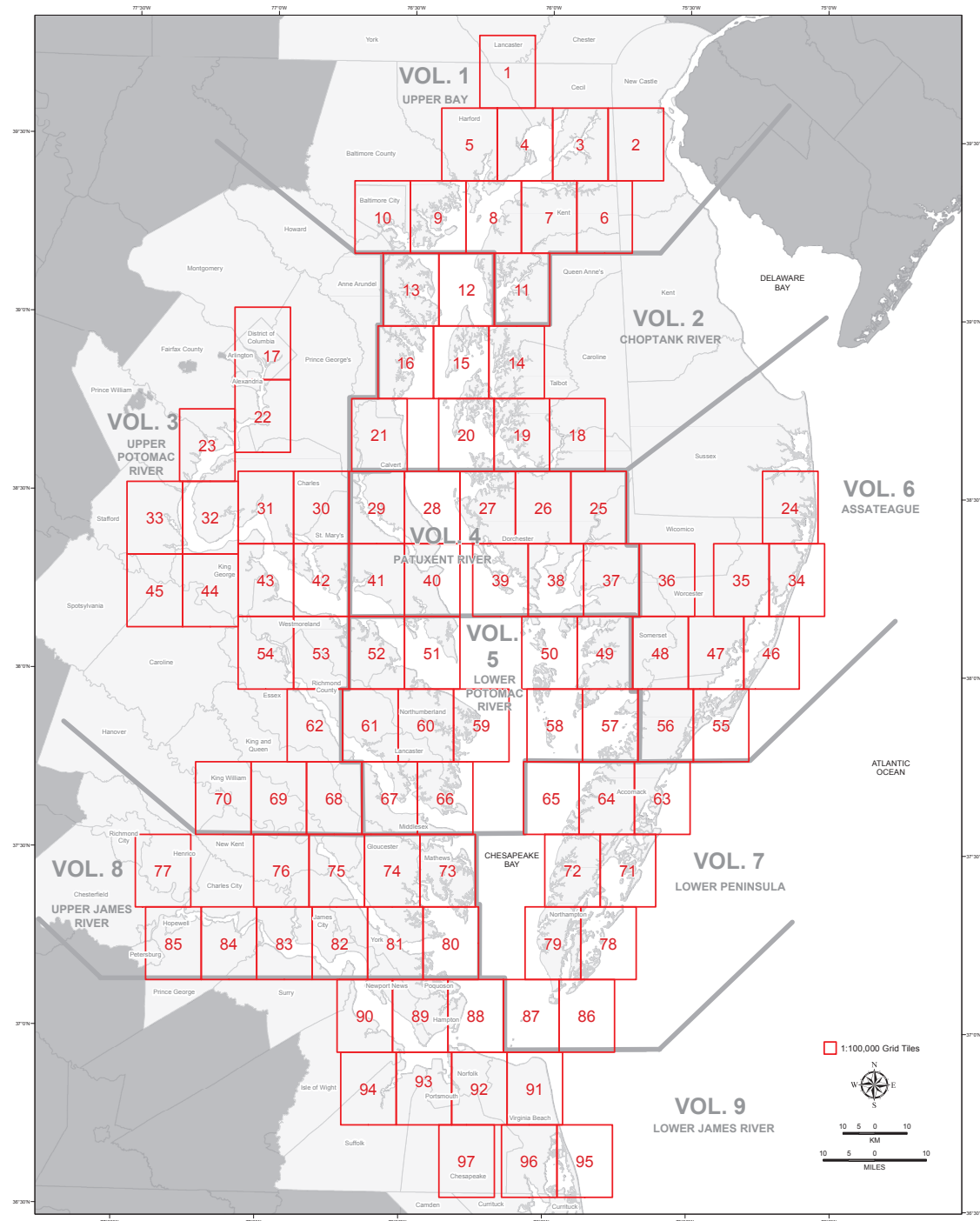
NOAA

Environmental Sensitivity

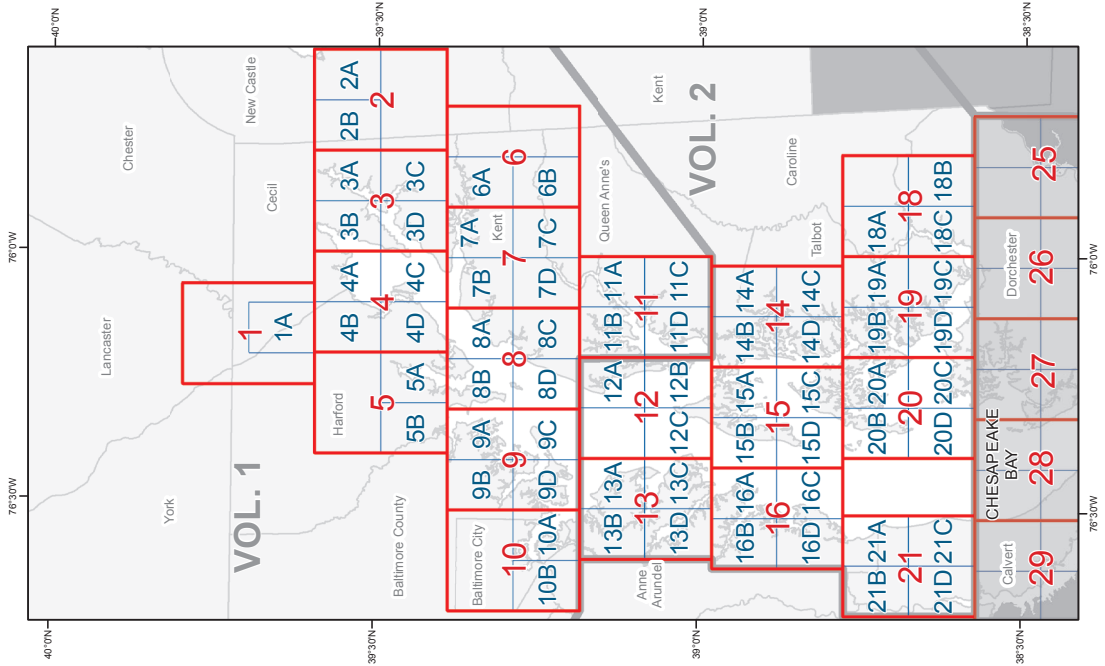
Index Maps

A Guide to Coastal Resources at Risk to Spilled Oil

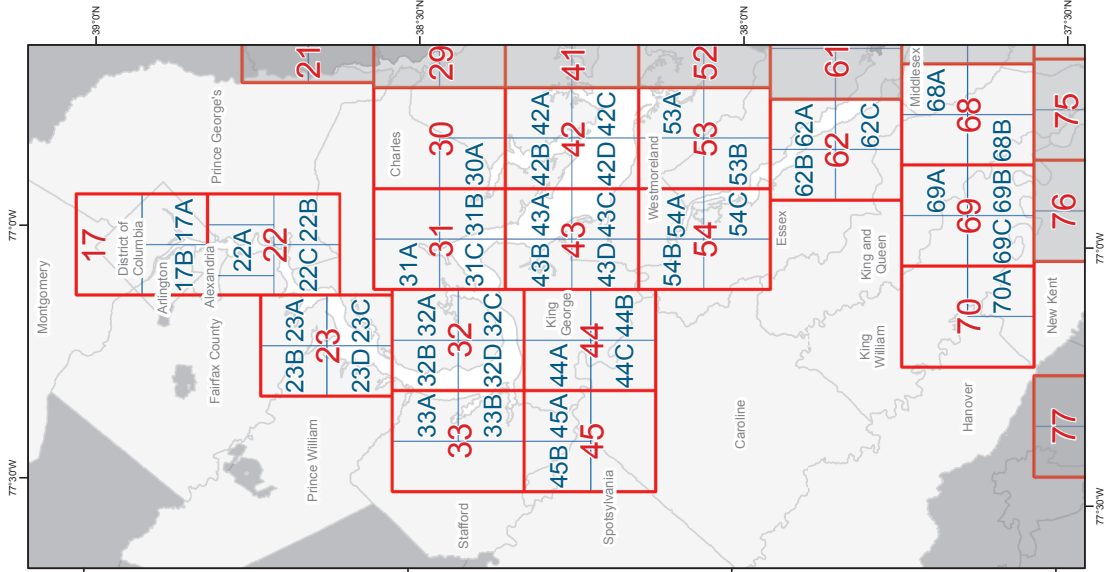
Chesapeake Bay and the Outer Coasts of Maryland and Virginia



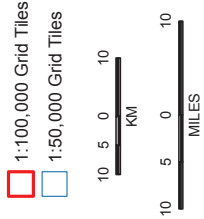
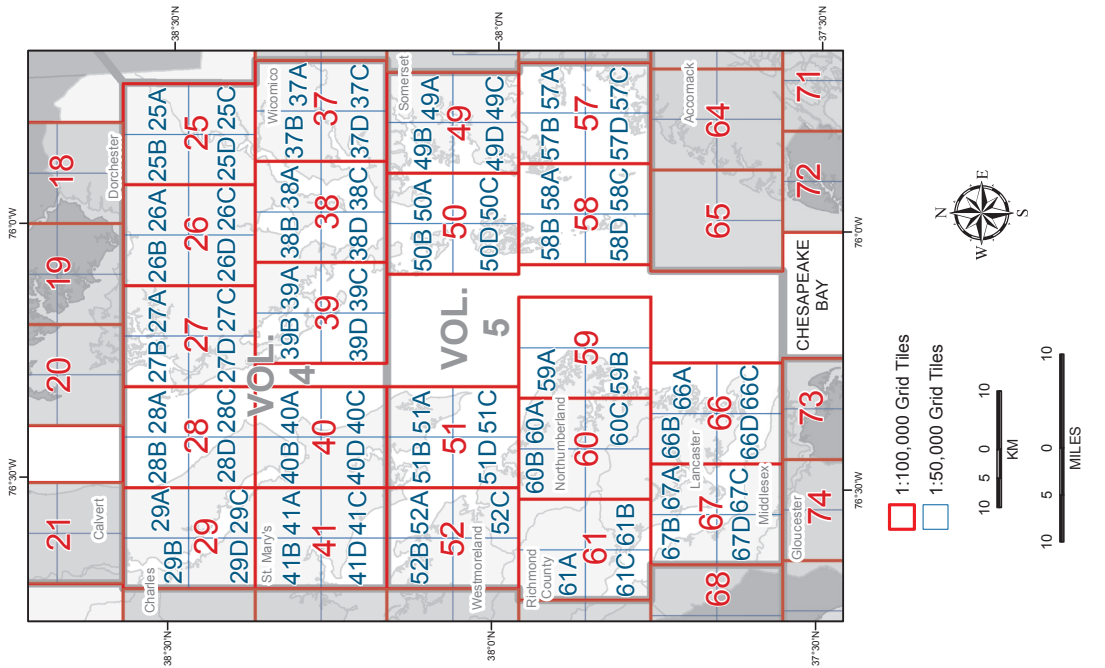
Chesapeake Bay: Volumes 1 and 2
(Chesapeake North:
Upper Bay and Choptank River)



Chesapeake Bay: Volume 3
(Chesapeake West:
Upper Potomac River)



Chesapeake Bay: Volumes 4 and 5
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ENVIRONMENTAL SENSITIVITY INDEX: CHESAPEAKE BAY AND THE OUTER COASTS OF MARYLAND AND VIRGINIA

INTRODUCTION

This Environmental Sensitivity Index (ESI) atlas was developed for the and marine and coastal areas of Chesapeake Bay and the outer coasts of Maryland and Virginia. The atlas covers the entire coastal area of Maryland and Virginia from the Pennsylvania and Maryland border to the north in the Susquehanna River, from the Delaware and Maryland border to the east at Fenwick Island, to Washington District of Columbia to the west at the Potomac River, and to the Virginia and North Carolina border to the south in Back Bay. The Maryland and Virginia ESI extends 12 nautical miles seaward. The inland extent of the study area includes lands and waters ranging from five to ten nautical miles from the shoreline of all tidal waters. The study area covers all Atlantic Ocean coastal bays, including (from north to south): Assawoman Bay, Isle of Wight Bay, Sinepuxent Bay, Newport Bay, Chincoteague Bay, Toms Cove, Metompkin Bay, Hog Island Bay, Cobb Bay, South Bay, Fishermans Inlet, and Back Bay. In addition, the study area encompasses all of Chesapeake Bay and major tidal tributary rivers, including (from north to south along the western Bay shoreline): Susquehanna River (south of the Pennsylvania and Maryland border), Back River, Patapsco River, Magothy River, Severn River, Rhode River, West River, Herring Bay, Patuxent River, Potomac River (north to Washington D.C.), Rappahannock River (west to Fredericksburg), York River, Mattaponi River (west to White Oak Landing), Pamunkey River (west to Hampstead), James River (west to Richmond), Appomattox River (west to the I-95 corridor), Nansemond River (west to Hwy 58), Elizabeth River (east to Hwy 168), North Landing River (south to the North Carolina border), Lynnhaven River, Wolfsnare Creek, and Linkhorn Bay. Also included in the study area are major tidal tributary rivers along the eastern Bay shoreline, including (from north to south): Elk River (and Back Creek to the Maryland and Delaware border), Sassafras River, Chester River, Eastern Bay, Wye River, Tred Avon River, Choptank River (east to Providence Landing), Fishing Bay, Nanticoke River (east to the Maryland and Delaware border), Manokin River (east to Kings Creek), Back Creek (east to Hwy 13), Big Annemessex River (east to Hwy 413), Pocomoke River (east to Pocomoke City), Beasley Bay, Pompc Creek, Deep Creek, Onancock Creek, Pungoteague Creek, Nandua Creek, Curratuck Creek, Craddock Creek, Occohannock Creek, Nassawaddox Creek, Hungars Creek, Cherrystone Inlet, and Longs Pond.]. The ESI represents a compilation of information about three main categories: shoreline habitats, sensitive biological resources, and human-use resources. Though the data will be useful for many shoreline applications, the goal of the ESI data is to present a concise summary of resources that may be particularly vulnerable to spilled oil. The intent of the data should caveat other uses. As an example, the ESI is not intended to present a catalog or comprehensive listing of species present in an area, rather the focus is on species particularly sensitive to oiling and life stages where vulnerability may increase.

SHORELINE HABITAT MAPPING

The shoreline and classifications were fully updated using the following sources and methods. The Chesapeake Bay and the outer coasts of Maryland and Virginia shoreline was derived from the integration of the Virginia Institute of Marine Science (VIMS) Center for Coastal Resources Management (CCRM) Tidal Marsh Inventory (TMI, 2010-2013); the National Oceanic and Atmospheric Administration (NOAA) Continually Updated Shoreline Product (CUSP, 1990-2015) and National Shoreline composite (2003-2015); the U.S. Geological Survey (USGS) high resolution National Hydrography Dataset (NHD, 2002-2014); the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) dataset (1974-2010); and manual digitization at 1:4,000 from BING Bird's Eye and Aerial imagery (2003-2014), ESRI Basemap World Imagery (2011-2015), and Google Earth aerial imagery (2013-2015). The most recent shoreline was utilized where available.

The intertidal shoreline habitats were classified based on the USFWS NWI wetland polygons and low-altitude oblique and nadir aerial imagery from: BING Bird's Eye, BING Aerial, ESRI Basemap, and Google Earth.

The ESI shoreline classification and ranking scale has been used to assess vulnerability of shoreline to spilled oil since the mid-1970s. Rankings range from 1 – least vulnerable, to 10 – most vulnerable, with a variety of qualifiers unique to the geographic region. The scale incorporates the following considerations:

- | | |
|--|--|
| 1) Shoreline type (substrate, grain size, tidal elevation, origin) | 3) Biological productivity and sensitivity |
| 2) Exposure to wave and tidal energy | 4) Ease of cleanup |

Prediction of the behavior and persistence of oil in intertidal habitats is based on an understanding of the dynamics of the coastal environments, not just the substrate type and grain size. The intensity of energy expended upon a shoreline by wave action, tidal currents, and river currents directly affects the persistence of stranded oil. The need for shoreline cleanup activities is determined, in part, by the slowness of natural processes in removal of oil stranded on the shoreline. The potential for biological injury and ease of cleanup of spilled oil are also important factors in the ESI shoreline ranking. Thus, shorelines exposed to high levels of physical energy, such as wave action and tidal currents, and low biological activity rank low on the scale, whereas sheltered shorelines with associated high biological activity have the highest ranking. The shoreline types delineated for Maryland and Virginia, presented in order of increasing sensitivity to spilled oil, are listed below.

- | | |
|--|--|
| 1A) Exposed, Rocky Shores | 7) Exposed Tidal Flats |
| 1B) Exposed, Solid Man-Made Structures | 8A) Sheltered Scarps (Bedrock/Mud/Clay) |
| 2B) Exposed Scarps and Steep Slopes (Clay) | 8B) Sheltered, Solid Man-Made Structures |
| 3A) Fine- to Medium- Grained Sand Beaches | 8C) Sheltered Riprap |
| 3B) Scarps and Steep Slopes (Sand) | 8D) Sheltered, Rocky, Rubble Shores |
| 4) Coarse-Grained Sand Beaches | 9A) Sheltered Tidal Flats |
| 5) Mixed Sand and Gravel Beaches | 9B) Vegetated Low Banks |
| 6A) Gravel Beaches | 10A) Salt- and Brackish-Water Marshes |
| 6B) Riprap | 10B) Freshwater Marshes |
| 6D) Boulder Rubble | 10C) Swamps |
| | 10D) Scrub and Shrub Wetlands |

For each of these shoreline types, a photo and description of the physical attributes, predicted oil behavior, and response considerations are included at the end of the introductory pages.

SENSITIVE BIOLOGICAL RESOURCES

Biological information presented in this atlas was collected, compiled, and reviewed with the assistance of biologists and resource managers from the following agencies:

- Center for Conservation Biology (CCB)
- Maryland Department of Natural Resources (MD DNR)
- National Park Service (NPS), Assateague Island National Seashore
- NPS Northeast Coastal and Barrier Network (NCBN)
- NPS Northeast Region
- National Oceanic and Atmospheric Administration (NOAA)
- North Carolina Division of Marine Fisheries – Habitat Protection Section, Albemarle-Pamlico National Estuary Program
- Saltmarsh Habitat and Avian Research Program (SHARP)
- The Nature Conservancy (TNC)
- Virginia Aquarium and Marine Science Center (VAMSC)
- Virginia Commonwealth University (VCU)
- Virginia Department of Conservation and Recreation (VA DCR)
- Virginia Department of Game and Inland Fisheries (VDGIF)
- Virginia Institute of Marine Science (VIMS), College of William and Mary
- Virginia Marine Resources Commission (MRC)
- U.S. Fish and Wildlife Service (USFWS), Division of Migratory Bird Management (DMBM)
- USFWS National Wildlife Refuge (NWR) System

The above organizations provided the majority of the biological information included in the atlas. Other participating organizations will be featured in the sources table and cited in the metadata accompanying the digital product.

The biological resources shown in this atlas were extracted from the ESI GIS data compiled for this region. The extracted features were mapped at scale of 1:50,000 and appear on the maps referenced by a combination of number and letter. For example, Map 1B will show the biological features in conjunction with the ESI shoreline. The biology maps on these maps is “layered” in the PDF maps. This allows the user to turn off the biological features to more clearly see the underlying shoreline and habitat polygons.

The data published date appearing at the bottom of the maps and on the cover page reflect when the data collection and compilation was completed. This atlas represents those data and was published September 2016.

KEY BIOLOGICAL FEATURES ON ESI MAPS

- 1) Occurrences of animal and plant species that are at risk to spilled oil or may be impacted during a spill response are represented in the database by polygons, points, and lines.
- 2) To avoid clutter, the front of the map features occurrences that cover less than 10 kilometers of the map extent. A Map ID is associated with each of these polygonal, linear or point features.
- 3) Each map includes a tabular report summarizing the species found in the area. Features that are shown on the map are referenced by their Map ID. Features that cover more than 10 kilometers are presented in the report as Widespread in Mapped Area. Species occurrences that appear in the database as General Distribution are listed in a third category, Also Present in Mapped Area. To fully understand the diversity of species present, ALL sections of the map report should be reviewed.
- 4) Associated with each species in the table is the state (S) and federal (F) protected status as threatened (T) or endangered (E), as well as concentration, seasonality, and life-history information. Federal listings were provided by USFWS. State listings were provided by MD DNR and VDGIF.
- 5) The table includes a Mapping Qualifier with each species record (see table of mapping qualifiers and guidelines below). The mapping qualifier should help users understand particular vulnerabilities associated with the map data.
- 6) Feature level source information is included in the GIS database used to create these maps. The GIS data also provides the extent polygons for all mapped features; it can be queried, filtered, and used with other GIS datasets.
- 7) Species have been divided into groups and subgroups based on their behavior, morphology, taxonomic classification, and spill vulnerability and sensitivity. The icons below reflect this grouping scheme.
- 8) Colors depicting monthly seasonality roughly reflect Winter/Spring/Summer/Fall, but are primarily intended to ease readability.

MARINE MAMMAL



Dolphin



Manatee



Pinniped



Whale

TERRESTRIAL MAMMAL



Bat



Small Mammal



Ungulate

HERPETOFAUNA



Amphibian



Turtle

INVERTEBRATE



Bivalve



Cephalopod



Crab



Gastropod



Insect



Lobster



Shrimp

FISH



Fish



Nursery

BIRD



Alcid/Pelagic



Diving



Gull/Tern



Passerine



Raptor



Shorebird



Wading



Waterfowl

HABITAT



Upland/Wetland/Plant

Mapping Qualifiers and Guidelines

Element	Qualifier	Guidelines
All	Concentration Area	Areas where concentrations are considerably higher than other records of the same species in the area of interest.
All	General Distribution	Used for broad, general distributions of species that are often mapped to landscape- or habitat-scale features.
All	Vulnerable Occurrence	Intended for records of rare species with discrete occurrences, where the conservation value of the species should be highlighted for spill response.
Birds, Herpetofauna, Marine Mammals, Fish, Invertebrates	Migration	Used when an area is a known staging area of high importance to the species for birds; and/or areas are potential or known migration corridors in the marine environment for other elements.
Birds, Herpetofauna	Nesting	Applicable to all nesting birds and herps. Should represent known nesting areas rather than all potential nesting habitat.
Birds	Rafting	Similar to 'Concentration Area' qualifier, but specific to large on-water concentrations.
Birds	Wintering	Designates known areas of importance to wintering birds.
Benthic	High Ecological Value	For use in areas where benthic organisms provide high ecological services, high quality habitat, or known areas of high biodiversity.
Fish and Invertebrates	Harvest Area	May be used as a qualifier for distributions in special cases, where the general distribution was not mapped and/or widespread and the distribution of the harvested resources is used to depict important areas.
Fish and Invertebrates	Nursery Area	Refers to specific areas of known importance to early life history stages (e.g., larvae, juveniles) of a species.
Fish and Invertebrates	Spawning Area	Areas where animals are spawning. Spawning is loosely defined as the release of gametes or eggs from the adult.

MARINE MAMMALS

Marine mammals depicted in this atlas include whales, dolphins, seals, and manatees. Species that are federally and state listed, and those that are vulnerable to oiling and response activities, are specifically emphasized. Marine mammal occurrence and seasonality information displayed in this atlas are based on data from the Ocean Biogeographic Information System (OBIS) and Global Biodiversity Information Facility (GBIF), NOAA Fisheries Marine Mammal Stock Assessment Reports (SARS), and correspondence with local resource experts from Virginia Aquarium and Marine Science Center and other agencies (see expert contact list). Both hardcopy and digital data sources are listed below and included in the metadata.

Four of the marine mammal species included in this ESI atlas are currently listed as endangered at both the federal and state level. These include the North Atlantic right whale (*Eubalaena glacialis*, FE, VA/MD SE), fin whale (*Balaenoptera physalus*, FE, VA/MD SE), humpback whale (*Megaptera novaeangliae*, FE, VA/MD SE) and the Florida manatee (*Trichechus manatus latirostris*, FE, VA SE), a sub-species of the West Indian manatee. Two of these species currently have federal proposals under review in 2016 that may change their federal statuses within the boundaries of this ESI, by either removing them from the ESA

listing altogether (humpback whale) or reclassifying them from endangered to threatened (Florida manatee). These proposals were under review at the time this atlas was published (hence, both are still considered endangered); however, their listings may change so it is important to review their listings prior to any planning or response activities.

North Atlantic right whales may be present in both Maryland and Virginia marine waters from October to May. The waters off the mid-Atlantic coast are an important migration corridor between their wintering and calving areas, located off the southeastern United States, to their summer feeding and nursery grounds in New England waters. Right whales are known to primarily occur in coastal and shelf waters, although movements into deeper waters have been observed.

Fin whales can be found off the U.S. Atlantic coast from Cape Hatteras, NC northward and are the dominant large cetacean in this region. Although typically observed over continental shelf waters eastward of the 12 nautical mile boundary of the ESI, they may be present in shallower waters closer to the coastline from November through April.

Humpback whales may be present in Maryland and Virginia coastal waters throughout the year, but are primarily observed during the winter months as they migrate between their winter calving grounds in the West Indies and their summer feeding grounds in the Gulf of Maine and areas further north. Not all humpbacks migrate every winter, and significant numbers can be found in mid- and high-latitude regions along the Atlantic coast during this time. During their migration, humpback whales tend to stay near the surface of the ocean. They are known to enter Chesapeake Bay, which may be a supplemental feeding ground for this species, especially for juveniles; however, most sightings occur near the mouth of the bay and the surrounding marine waters.

The Florida manatee was mapped from information provided by peer-reviewed literature and local resource experts. This species is an irregular visitor to the Chesapeake Bay region and has, on rare occasion, been observed in the Maryland portion of the Chesapeake Bay, as far north as the Susquehanna River. They are a warm-water species (68°F or above) that feed on seagrasses and other aquatic plants, and can be found in marine, brackish and freshwater habitats. They usually travel along shorelines and within channels (i.e., Intracoastal Waterway) and may be present in shallow nearshore waters during the summer and fall months when water temperatures are above 68°F. Most of the reported sightings in Chesapeake Bay have been south of the Potomac River, with the majority of them occurring in the waters proximal to Norfolk, VA.

Other marine mammals were mapped using information provided by local marine mammal experts. Literature and thirty years of observation data from the SARs reports, OBIS, and GBIF were also reviewed. Bottlenose dolphins are the only species likely to occur regularly in inshore and offshore areas and may be present year round. Other species of cetaceans and pinnipeds that may occur in Chesapeake Bay and/or the coastal or continental shelf waters of Maryland and Virginia that were mapped in this atlas include gray seals, harbor seals, harbor porpoises, and short-beaked common dolphins.

In addition to those species mapped, other pelagic cetacean and pinniped species can occasionally move into the area without predictable occurrence. Species have been reported via stranding data or other observations, but are not included due to their relative rarity of occurrence within the mapped 'Area of Interest' (AOI) for this atlas.

Expert contacts for Chesapeake Bay and the outer coasts of Maryland and Virginia marine mammals*:

Name	Agency	City	Phone	Species
Susan Barco	VAMSC	Virginia Beach, VA	757/385-6476	Cetaceans, Pinnipeds and Sirenia
Mark Swingle	VAMSC	Virginia Beach, VA	757/437-6022	Cetaceans, Pinnipeds and Sirenia
Jennifer Dittmar	National Aquarium, Baltimore	Baltimore, MD	410/986-2377	Cetaceans and Pinnipeds
Amanda Weschler	MD DNR	Oxford, MD	410/226-5193	Cetaceans and Pinnipeds
Kevin Holcomb	USFWS	Chincoteague, VA	757/336-6122	Chincoteague and Wallops Island NWRs
Alex Wilke	TNC	Nassawadox, VA	757/442-3049	Eastern Shore species
Ruth Boettcher	VDGIF	Machipongo, VA	757/709-0766	Eastern Shore species

***Note: this list is not meant to represent all marine mammal experts for the region.**

Major Data Sources Used: Marine Mammals

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- Waring G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel, editors. 2015. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2014. NOAA Tech Memo NMFS NE 231, 361 p. doi: 10.7289/V5TQ5ZH0. Accessed at <http://www.nmfs.noaa.gov/pr/sars/region.htm>.

BIRDS

Birds displayed in this atlas include: alcids, diving birds, gulls, terns, passerines, pelagic birds, raptors, shorebirds, wading birds, and waterfowl. Species that are federally and state listed, and coastal nesting, roosting, and migratory staging locations are specifically emphasized. Bird occurrence information displayed in this atlas is based on information gathered at workshops and via phone/email correspondence with local resource experts from VDGIF, MD DNR, NPS, USFWS, CCB, and TNC. Additional hardcopy and digital sources are listed below and included in the metadata.

Shorebirds, diving birds, gulls and terns – Survey data on locations of breeding, migrating, and/or wintering shorebirds, diving birds, gulls, and terns were provided by various agencies via shapefiles, spreadsheets, primary literature, and expert local knowledge, and was supplemented with information from eBird. In general, data from the various data sources were compiled and either mapped to habitat, park or refuge, or specific locations, per expert recommendations. Additional source information is provided in the accompanying data tables and metadata.

Colonial waterbird nesting areas – For Virginia, VDGIF provided nesting data for colonial waterbirds from 2013 that originated from various partner organizations including: CCB, VDGIF, TNC, VA DCR, USFWS, USGS, and College of William and Mary. Each nesting colony location was buffered by 200 meters (m), and where buffered nest locations overlapped, buffers were dissolved to form single polygons, and counts from the dissolved colonies were summed. Number of nesting pairs for each species for each colony and aggregated colony were reported in the ESI.

For Maryland, MD DNR provided nesting data for colonial waterbirds from surveys conducted annually during 2004-2013. Each nesting colony location was buffered by 200 m, and where buffered nest locations overlapped, buffers were dissolved to form single polygons, and counts from the dissolved colonies were summed. Number of nesting pairs for each species for each colony and aggregated colony were reported in the ESI.

Additionally, CCB provided nesting heron and egret survey data for the entire Chesapeake Bay drainage area (including MD), also from 2013. Where the heron/egret colonies overlapped with the VA colonial waterbird colonies, the heron/egret counts were added to the existing colony. Elsewhere, the heron and egret survey locations were mapped as points with counts of pairs for each species for each point location. Overall, species mapped using colonial waterbird datasets in VA include: black-crowned night-heron, black skimmer (MD SE), brown pelican, Caspian tern, cattle egret, common tern, double-crested cormorant, Forster's tern, glossy ibis, great black-backed gull, great blue heron, great egret, green heron, gull-billed tern (VA ST, MD SE), herring gull, laughing gull, least tern (MD ST), little blue heron, royal tern, sandwich tern, snowy egret, tricolored heron, white ibis, and yellow-crowned night-heron.

Wintering and nesting waterfowl – Tens of thousands of waterfowl migrate through Chesapeake Bay and Atlantic coastal bays with numbers of southbound transients peaking October through December and northbound transients peaking February through April. High numbers of scoters, red-throated loon, northern gannet, and other seabirds frequently concentrate at the mouth of Chesapeake Bay, Tangiers Sound, and the mouth of the Choptank River from November through April. Chesapeake Bay marsh islands and coastal bays provide habitat for the highest concentrations of nesting American black duck in the region. Waterfowl data for Virginia and Maryland were provided by VDGIF and USFWS and included mid-winter waterfowl surveys (2004-2015) and expert knowledge from VDGIF and MD DNR.

In Maryland, diving ducks and geese along the Chesapeake Bay were mapped into Areas of Critical State Concern for waterfowl (defined under Maryland's State Planning enabling legislation, article 88C). In coastal bays these species were mapped with a 250-m offshore buffer based on MD DNR surveys (2013-2014). Dabbling ducks were mapped based on USFWS mid-winter survey blocks and MD DNR coastal bay surveys with a 250-m onshore/offshore buffer. In Virginia, species were mapped according to areas defined by VDGIF when compiling aerial survey data for USFWS mid-winter surveys (2004-2015) and expert knowledge. Counts were binned into Present, (<10), 10s, 100s, 1,000s, or 10,000s.

Nesting waterfowl occurrences in Maryland were derived from MD DNR expert knowledge and data from the Second Atlas of the Breeding Birds of Maryland and the District of Columbia compiled by U.S. Geological Survey; they are mapped as a 250-m onshore buffer. In Virginia, American black duck nesting distributions were mapped based on VDGIF expert knowledge; mallard and Canada goose were mapped using species' presence during mid-winter surveys in or near marsh habitats; and wood duck were mapped using species' presence during mid-winter surveys in swamps and freshwater marshes. Nesting concentrations for waterfowl are represented as Present, Low, Moderate, High, or Very High. Onshore buffers that intersected with larger areas of freshwater or salt-and brackish-water marsh included those areas as part of the mapped distribution. Numbers from wintering surveys are likely underestimates, since surveys do not necessarily occur during each species' months of peak abundance.

Atlantic Ocean and Chesapeake Bay seabirds – Distribution of pelagic birds, gulls, terns, diving birds, alcids, phalaropes, and waterfowl in open waters of Chesapeake Bay and tributaries and the Atlantic Ocean (nearshore and offshore) were generated from discussions with resource experts, reports, and survey data. Species in open waters of Chesapeake Bay and the Atlantic Ocean were mapped from compiled aerial and shipboard survey data from USFWS that included: USFWS Atlantic Coast Wintering Sea Duck Surveys (ACWSD; preliminary survey in 2008, full surveys 2009-11), USFWS Atlantic Marine Assessment Program for Protected Species (AMAPPS) seabird surveys (preliminary survey in 2010, full-coast surveys in summer 2011, spring and fall 2012, winter 2014), NOAA EcoMon surveys, and Department of Energy (DOE)/Biological Research Institute (BRI) surveys (2012-2014). Distributions in Chesapeake Bay tributaries were mapped from USFWS midwinter surveys (2004-2015), BRI reports (2015), and eBird records from 2004-2016. Based on frequency of occurrence, abundance in these areas, and expert advice, data were grouped to create divisions throughout Chesapeake Bay and its tributaries, at the mouth of Chesapeake Bay, and as offshore polygons made as either a 0-5 nautical mile (nm) offshore buffer or a 0-12 nm offshore buffer. Counts were binned into Present (<10), 10s, 100s, 1,000s, or 10,000s.

Raptors – Bald eagle nest survey data (2015) were provided by CCB for Virginia. Nest locations were mapped as points in the ESI. Recent bald eagle nest survey data was not available for MD, as the state no longer surveys for the species. Historical data (1988-2010) of MD nest locations were mapped as points with the last observation date noted in the ESI concentration field. According to local experts (D. Brinker, L. Davidson), bald eagle nests are common in the state and the historical dataset is incomplete and does not fully cover where the species currently nests. VDGIF provided a Bald Eagle Concentration and Roosts (BECAR) dataset that features concentration areas along shorelines that have been identified through surveys to support a high density of non-breeding bald eagles in summer and/or winter. Roost sites are sites that have been documented as repeatedly used as night-time resting places for multiple bald eagles, and are displayed as both polygons (based on the VDGIF BECAR data set) and points (based on the CCB data set). Peregrine falcon and osprey nest sites were mapped based on expert knowledge and/or nesting survey data. Northern harrier were mapped based on expert knowledge.

Secretive marsh birds – Black rail (VA SE) detection data for Virginia were provided by CCB for 2007-2008 and 2014. Data from both datasets largely overlapped, so the datasets were combined for the ESI. Points were buffered by 200 m. Patch analysis data for clapper rail, saltmarsh sharp-tailed sparrow, seaside sparrow, and willet were provided by SHARP. The patch analysis used habitat data from NWI to delineate marsh patches, and field surveys of the target species to model species densities in each patch. Species densities were converted to number of birds per square kilometer and mapped to the appropriate marsh patches. Additionally, there were four SHARP survey sites on the western side of the Chesapeake Bay that had detected clapper rails in numbers too low for patch analysis. These survey sites were mapped as 50-m buffer polygons. NPS NCBN provided survey data of the following marsh birds on Assateague Island: clapper rail, king rail, saltmarsh sharp-tailed sparrow, and seaside sparrow. Each survey location with birds detected was mapped with a 200-m buffer. Where overlap occurred between SHARP data and NCBN data, SHARP data were used because they contained more detailed spatial and concentration information.

Rare birds - A few rare bird species were mapped using data supplied by MD DNR from their Ecologically Significant Areas database. Data from this program came in the form of large generalized polygons that often include the presence of more than one species. Bird species mapped from this data set include: American bittern, black rail (MD SE, VA SE), black skimmer (MD SE), common moorhen, gull-billed tern (MD SE, VA ST), least bittern, peregrine falcon (VA ST), and royal tern (MD SE).

Note that locations of nesting, wintering, and/or migratory sites, species composition within polygons, and particularly concentration values, are based on a compilation of observations made over multi-year periods and are not meant to accurately reflect ‘current’ conditions in the case of an event. Survey limitations and adjustments in protocols over the years, changes in shoreline geomorphology (particularly on small/ephemeral islands), weather, and other ecological factors contribute to the condition of nesting colonies and migratory or other concentrations at any given time. Also, note that concentrations vary throughout the multi-month nesting, migratory, and wintering periods listed in the seasonality table. Please contact local resource experts in the event of a spill or if data are to be used for any reason other than spill planning or response.

Expert contacts for Chesapeake Bay and the outer coasts of Maryland and Virginia birds*:

Name	Agency	City	Phone	Species
Ruth Boettcher	VDGIF	Machipongo, VA	757/709-0766	Birds of Virginia Eastern Shore
Bryan Watts	CCB	Williamsburg, VA	757/221-2247	Birds of Virginia and Chesapeake Bay
Alex Wilke	TNC	Nassawadox, VA	757/442-3049	Birds of Virginia Eastern Shore
Kevin Holcomb	USFWS	Chincoteague, VA	757/336-6122	Chincoteague and Wallops Island NWRs
Pam Denmon	USFWS	Cape Charles, VA	757/331-2760	Eastern Shore of Virginia and Fisherman Island NWRs
Lauren Billodeaux Mowbray	USFWS	Virginia Beach, VA	757/301-7329	Back Bay NWR and Eastern Virginia Rivers NWRC
Doug Brewer	USFWS	Virginia Beach, VA	757/301-7329	Back Bay NWR
Geralyn Mireles	USFWS	Virginia Beach, VA	757/301-7329	Back Bay NWR
Jack Kumer	NPS	Berlin, MD	410/629-6070	Assateague Island NS
Bill Hulslander	NPS	Berlin, MD	410/629-6061	Assateague Island NS

Name	Agency	City	Phone	Species
Dave Brinker	MD DNR	Annapolis, MD	410/744-8939	Maryland colonial-waterbirds
Lynn Davidson	MD DNR	Annapolis, MD	410/260-8563	Digital data provider
Gary Costanzo	VDGIF	Charles City, VA	804/367-1000	Waterfowl
Ben Lewis	VDGIF	Charles City, VA	804/367-1000	Waterfowl
Bill Harvey	MD DNR	Cambridge, MD	410/221-8838	Waterfowl
Don Webster	MD DNR	Cambridge, MD	410/221-8838	Waterfowl
Larry Hindman	MD DNR (Retired)	Cambridge, MD	-	Waterfowl
Paul Padding	USFWS	Laurel, MD	301/497-5851	Waterfowl
Tim Jones	USFWS	Laurel, MD	301/497-5674	Seabirds
Emily Silverman	USFWS	Laurel, MD	301/497-5801	Seabirds
Caleb Spiegel	USFWS	Hadley, MA	413/253-8490	Seabirds
Matt Whitbeck	USFWS	Cambridge, MD	410/221-2034	Chesapeake Marshlands NWR Complex

***Note: this list is not meant to represent all bird experts for the region.**

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HERPETOFAUNA

Herpetofauna depicted in this atlas include four species of sea turtles, diamondback terrapin, barking treefrog (VA ST), chicken turtle (VA SE), and snapping turtle.

Nesting and in-water distribution data for diamondback terrapins were provided by VIMS (in-water data set), USGS (nesting data set), and USFWS (pers. comm.). The VIMS data set was based on 2012 and 2013 spring-summer surveys at 165 sites and was conducted to study the relationship between terrestrial-aquatic connectivity and the distribution of an estuarine turtle. The results of the survey included predicted probability of occupancy of diamondback terrapins in the Chesapeake Bay, and the ‘high’ and ‘low’ probabilities of occupancy that were determined during the study were adapted for inclusion and

represented as likely terrapin distribution polygons in the ESI. The USGS nesting data set was based on the results of the Patuxent Wildlife Research Center investigation of over 3,000 kilometers of Chesapeake Bay shoreline in 2002 for terrapins, tracks, and active and disturbed nests.

Green (FT/MD ST, VA ST), Kemp's ridley (FE/MD SE, VA SE), leatherback (FE/MD SE, VA SE) and loggerhead (FT/MD ST, VA ST) sea turtles were mapped in this atlas. Many barrier island, and some mainland, outer sand beaches are important nesting habitat for loggerhead sea turtle, and potential (but very rare) nesting habitat for Kemp's ridley and green sea turtles. Nesting typically occurs in Virginia and Maryland from May to August with hatching from June-October (loggerhead sea turtle). Data that represent documented nesting in Virginia from 1970-2015 were provided by VDGIF. The concentration values were based on the range of nest counts observed on a particular stretch of beach over time (e.g., 0-8 nests, <10 nests). Beach buffers were used rather than point locations due to the potential for beaches adjacent to known nest sites to also provide suitable nesting habitats. Green sea turtle and Kemp's ridley sea turtle were documented as having 'false crawls' only and no nest counts. Additional nesting and general distribution and seasonality information were provided during interviews with NPS, USFWS, and the VA Aquarium.

Distributions for the barking treefrog (VA ST) and chicken turtle (VA SE) were mapped using data provided as part of VDGIF's Wildlife Environmental Review Map Service (WERMS) database. Records of both species were pulled from survey dates between the years 1996 and 2013, with 2013 being the most recent surveys for herpetofauna in the database.

Expert contacts for Chesapeake Bay and the outer coasts of Maryland and Virginia herpetofauna*:

Name	Agency	City	Phone	Species
Ruth Boettcher	VDGIF	Machipongo, VA	757/709-0766	Sea turtles
Jack Kumer	NPS	Berlin, MD	410/629-6070	Assateague Island NS
Lauren Billodeaux Mowbray	USFWS	Virginia Beach, VA	757/301-7329	Back Bay NWR
Susan Barco	VA Aquarium	Virginia Beach, VA	757/385-6476	Sea turtles
Robert Isdell III	VIMS	Gloucester Pt., VA	804/684-7179	Diamond-back terrapins
Jay Kapalczynski	VDGIF	Henrico, VA	804/367-6796	WERMS Database

***Note: this list is not meant to represent all herpetofauna experts for the region.**

Major Data Sources Used: Herpetofauna

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National Marine Fisheries Service. 2015. Virginia and Maryland Sea Turtle Conservation Plan. National Marine Fisheries Service, Virginia Beach, 58 pp.

USFWS. 2012. Presquile National Wildlife Refuge. Comprehensive Conservation Plan, USFWS, Warsaw, VA, 306 pp.

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Virginia Institute of Marine Science. 2015. Terp occupancy, vector digital data.

FISH

Fish species depicted in this atlas include select marine, estuarine, and freshwater species. Species of conservation interest, commercial or recreational importance, or ecological importance are emphasized. Fish polygons were created based on fisheries-independent survey information, digital data, and expert opinion provided primarily by resource experts at MD DNR, VDGIF, VIMS, VMR, ASMFC, USFWS, and NOAA.

Atlantic and Shortnose sturgeon - Populations of shortnose sturgeon (FE, VA/MD SE) and Atlantic sturgeon (FE, VA SE) are found in Chesapeake Bay and adult and sub-adult Atlantic sturgeon distributions also encompass the coastal waters of Virginia and Maryland. Data on shortnose sturgeon populations in Chesapeake Bay are limited to incidental catches during a tagging program for Atlantic sturgeon by USFWS, and to a few recent studies of movements in the Potomac river. Generally, shortnose sturgeon are concentrated in the upper portions of the Chesapeake Bay, roughly from the mouth of the Chester River and north, but they are not uncommon to the mouth of the Potomac, and have been found to stray as far south as the James River in Virginia. No spawning of shortnose sturgeon has been documented in Chesapeake Bay, but there is some evidence of potential for spawning in the Potomac River and possibly the Susquehanna River. Atlantic sturgeon inhabit all areas in the Chesapeake Bay at various life stages. For the purposes of the ESI, life stages of Atlantic sturgeon were defined using definitions published by the Atlantic States Marine Fisheries Commission (ASMFC). In the ESI data tables, larvae refer to fish less than 4 weeks old, juveniles refer to young-of-year, and adults include both sub-adults (age 2 to 15) and adults. Eggs, larvae, and juveniles are restricted to known or potential spawning rivers, including the James, Nanticoke, Pocomoke, Rappahannock Rivers, and the York River system, which includes the Mattaponi and Pamunkey Rivers.

Special concentration information was also included for Atlantic and shortnose sturgeon spawning and migration areas. For Atlantic sturgeon, the concentration field was used to differentiate between spring and fall spawning migration runs in the James River, where adult sturgeon have been documented making spawning forays during both spring and fall months. However, spawning itself has only been conclusively documented during the fall. Areas within the Mattaponi, Pocomoke, Nanticoke, Rappahannock, and James Rivers (spring run) were marked as 'Potential Spawning' due to the fact that while milting and migrating adult fish have been documented, fertilized eggs have not been documented in these systems. Fall spawning has only been documented for the Pamunkey and James Rivers. Finally, two areas were marked as concentration areas for Atlantic sturgeon, one in the Nanticoke River, and one in the James River. Both areas are known to attract high numbers of adults and sub-adults and are believed to be staging areas for spawning runs upstream.

Anadromous Fish – Virginia - A number of other anadromous species' spawning runs and nursery areas were mapped based on multiple data sources. Alewife, blueback herring, American shad, and hickory shad distributions were mapped based on expert knowledge provided by Eric Brittle and Alan Weaver (VDGIF), The Nature Conservancy's Chesapeake Fish Passage Prioritization Project data, and the Habitat Requirements for Chesapeake Bay Living Resources. White and yellow perch spawning and nursery areas were initially mapped using the Habitat Requirements for Chesapeake Bay Living Resources and were modified based on comments from VDGIF, USFWS, and VIMS biologists. Striped bass spawning and nursery areas were mapped primarily based on expert knowledge from VIMS and VDGIF biologists.

Anadromous Fish – Maryland - Alewife, blueback herring, American shad, and hickory shad distributions were mapped based on expert knowledge provided by Jim Thompson and Margaret McGinty (VDGIF), The Nature Conservancy's Chesapeake Fish Passage Prioritization Project data, and MD DNR data on river herring spawning and nursery habitat. White and yellow perch spawning and nursery areas were initially mapped using the Habitat Requirements for Chesapeake Bay Living Resources and were modified based on comments from MD DNR and USFWS biologists. Striped bass spawning and nursery areas were mapped using MD DNR data on spawning reaches and rivers, and were expanded based on expert knowledge of MD DNR staff. Anadromous fish presence and spawning runs in the Coastal Bays of Maryland were mapped based on expert knowledge provided by Steve Doctor and Angel Willey.

It should be noted that alewife, blueback herring, and shad species spawn outside of the areas identified as 'spawning areas' in the ESI. This is especially true of the two herring species which utilize freshwater streams and lakes to a large degree for spawning. Also, note that eel life histories do not match the standard ESI terminology, so for the purpose of this ESI, 'juveniles' correspond to immigrating glass eels and 'adults' refer to resident yellow eels and emigrating silver eels. Lastly, striped bass juveniles and sub-adults can be found year-round in Chesapeake Bay. Mature females typically join the coastal migration at year three or four, and while the majority of males do as well, some are known to become permanent residents in the Bay. Areas in the ESI identified as 'spawning' or 'nursery' areas, specifically large areas in the Potomac, York, James, and Rappahannock Rivers, represent the most important early life stage areas; however, striped bass likely utilize other smaller tributaries and water bodies for spawning as well.

Finally, there was special consideration given to a number of rivers on the western shore of Chesapeake Bay in Maryland. These are rivers where anadromous fish still make migratory runs and attempt to spawn. However, the deteriorated condition of these rivers prevents the successful maturation of eggs and larvae. Thus, while these rivers still attract significant numbers of spawning adult fish, they are functionally sterile. Rivers on the western shore that were identified by MD DNR staff as described above include: Bush River, Severn River, South River, and Magothy River. Anadromous fish species that attempt to utilize these rivers for spawning have been recorded in the ESI attribute table 'Concentration' field with the designation 'Historical Spawning'.

Freshwater fish - Maryland - Freshwater finfish distributions were initially mapped to the river systems based on sampling data (2000-2014) from the Maryland Biological Stream Survey (MBSS). This survey is conducted on a yearly basis during the summer months in streams throughout Maryland using a stratified-random sampling method to determine the yearly sampling locations, except for a limited series of sentinel or reference sites that are sampled every year. Although the MBSS does not sample in the main stems of Maryland's rivers, as it is specifically a survey conducted in smaller tributaries that feed the major rivers, MBSS survey data were used to assign initial fish distributions to the fresh water reaches of Maryland's river systems (Back, Bohemia, Bush, Chester, Choptank, Elk, Gunpowder, Middle, Nanticoke, North East, Patuxent, Potomac, Sassafras, and Susquehanna) included in this ESI. MBSS data were utilized due to a lack of sampling data available for the fresh water portions of these rivers. Fish species that were captured in multiple years (>3) and in multiple sampling locations (>5) within the watersheds were included in the initial freshwater fish distribution lists and assigned to river polygons proximal to the sites where they were captured. In the Potomac River, freshwater fish species captured in the VIMS Juvenile Fish and Blue Crab Trawl Survey, which encompasses sampling effort up to the approximate fresh/salt water mixing zone in the Potomac (and James, Rappahannock and York Rivers in VA), but not captured by the MBSS, were also included in the initial distributions to supplement the MBSS data (see also methods below under marine and estuarine fish). Seasonalities for spawning and the presence of various life stages were assigned using information contained in the Field Guide to Fishes of the Chesapeake Bay, when available, due to a lack of year round sampling data.

Through consultations and in-person meetings with resource managers/scientists at MD DNR who were responsible for the sampling programs and management of Maryland's freshwater fisheries, fish species included in the initial distribution assessment (as described above) were systematically reviewed for their spatial distributions and life history characteristics (seasonalities) and either accepted, modified, or removed based on the comprehensive knowledge and expert opinions of the MD DNR reviewers.

Freshwater fish - Virginia - In Virginia, freshwater species were mapped in the river systems, bays, and sounds using data from the VIMS Juvenile Fish and Blue Crab Trawl survey, VDGIF Wildlife Environmental Review Map Service (WERMS) Species Observations Database, USFWS Back Bay National Wildlife Refuge fishery management plans and survey data, and expert opinion from VIMS scientists and VGDIF staff.

Freshwater species distributions were mapped in the main rivers in Virginia (James, Rappahannock and York Rivers) primarily using data from the VIMS Juvenile Fish and Blue Crab Trawl dataset, which was summarized by VIMS for the sampling years 2005-2014, to give total number of fish captured by species per sampling station. Utilizing this summary, the frequency of each species caught during each month

was calculated for the designated sampling regions, which were based on polygonal regions designated by VIMS for the trawl survey. Initial distributions were based on species that were captured in the trawl survey at a 10% frequency or higher (based on number of trawls) in a given month for a given sampling region. Species that met the 10% threshold were marked as present for that month and region.

Some rivers and bays in Virginia had only limited or no sampling data, including Currituck Sound, Back Bay, and North Landing River. Initial fish distributions for these areas were developed using available publications, including management plans, and limited survey data (when available). Fresh water regions lacking all data were initially populated for species using data from adjacent sampling regions (i.e., VIMS Juvenile Fish and Blue Crab Trawl) and the WERMS Species Observations Database. Additional distributions and life history seasonalities, such as larvae, eggs, and spawning months, were typically gathered from the Field Guide to Fishes of the Chesapeake Bay (Murdy and Musick, 2013) and expert knowledge provided by VIMS scientists or VDGIF staff.

Through a series of consultations and in-person meetings with resource managers/scientists at VIMS and VDGIF, who are responsible for the sampling programs and/or management of Virginia's freshwater fisheries, fish species included in the initial distribution assessment (as described above) were systematically reviewed for their spatial distributions and life histories (seasonalities) and either accepted, modified or removed based on the knowledge and expert opinions of the reviewers.

Additional fresh water fish species known to occur in the river systems of Maryland and Virginia, which were not contained within the initial data request and assessment, were also included in this ESI based on the expert opinion of the reviewers from the respective states.

Nearshore and Estuarine Fish Species – Nearshore marine and estuarine distributions of fish species were mapped primarily using fishery-independent data from the Northeast Area Monitoring and Assessment Program (NEAMAP), the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAAP), MD DNR Coastal Bays Fisheries Investigation, and VIMS Juvenile Fish and Blue Crab Trawl Survey. These data sets were supplemented with information from Funderburk et al. (1991), Murdy and Musick (2013), and then systematically reviewed by resource managers and scientists from MD DNR, VDGIF, USFWS and VIMS.

Data from ChesMMAAP and the VIMS Juvenile Fish and Blue Crab Trawl Survey were used to map fish species distributions within Chesapeake Bay and its tributaries. ChesMMAAP data, which was initially requested for 40 commercially and/or recreationally important species, is collected during the months of March, May, July, September and November. The VIMS Juvenile Fish and Blue Crab Trawl Survey is conducted in every month throughout the year. The VIMS Trawl survey was also used to map species into the three main Virginia tributaries of the Chesapeake Bay (James River, Rappahannock River and the York River) and the Potomac River in Maryland, up to, and including, the fresh water boundary regions (see fresh water fish species above). Both datasets were used as a reference for fish distributions in Maryland's river systems, where there was a lack of sampling data available. Each requested dataset was summarized by the data provider for the sampling years 2005-2014 to give total number of occurrences per sampling station by species. From these summaries, the frequency of capture of each species caught during each month for each sampling region was calculated (based on how many times a species was captured in a trawl divided by the total number of trawls conducted in the sampling region). The standardized polygonal sampling regions provided by the respective surveys for each of these datasets were used to create the geographic distributions of species. Species that were found to occur with a 10% frequency or higher in a given month for a given sampling region were marked as present for that month and sampling region. Due to the limited sampling times in the ChesMMAAP data, the final monthly presence and absence data was determined through in-person consultations with VIMS and MD DNR scientists.

For marine species in the Atlantic Ocean from the coast out to 12 nm for both Maryland and Virginia, fish species distributions and seasonalities were initially created using data from the NEAMAP trawl survey, which began sampling in the fall of 2007. NEAMAP sampling takes place in the coastal waters of Maryland and Virginia in the spring (April and occasionally May) and fall (October) each year. Data used for the ESI included trawls from the years 2007-2014, and the frequencies of species caught were used to

determine monthly presence/absence for the sampling months. Presence within a sampling month was determined by the same 10% frequency cut-off outlined for the ChesMMAP and VIMS Trawl data above. Due to the limited sampling times in the NEAMAP data the final monthly presence and absence data were determined through face-to-face consultations with VIMS and MD DNR scientists.

Maryland's Coastal Bays Fisheries Investigation (CBFI) Survey data, summarized by MD DNR, were used to initially map species distributions in the coastal bays of Maryland. Due to a lack of survey data in Virginia's coastal bays, CBFI data were also used as a reference for initial species distributions in the coastal bays of Virginia. Species distributions for the Back Bay region were mapped based on reports and data supplied by USFWS and expert opinion from VDGIF scientists.

Additional species distributions and life history traits, such as larvae, eggs, and spawning months, were gathered from the Field Guide to Fishes of the Chesapeake Bay (Murdy and Musick, 2013), ELMR Program data (Stone et al., 1994) and expert opinion from MD DNR and VIMS. All marine and estuarine species distributions and presence/absence data included in this ESI were systematically reviewed and approved through consultations with MD DNR, VDGIF, USFWS and VIMS scientists.

Sharks - The southern region of Chesapeake Bay is an important nursery area for several shark species. Nursery areas and general distributions of sharks were mapped based on expert knowledge from scientists at MD DNR and VIMS, who conduct both adult longline and juvenile shark (COASTSPAN) surveys within the area covered by this atlas. Note that the life-history stages for fish in the ESI data structure do not match the correct terminology for sharks. As a result, areas with months for shark 'larvae' represent months for which that polygon serves as habitat or a nursery area for young-of-year sharks (i.e., primary nursery areas).

Estuarine and marine fish species generally spawn where and when environmental conditions are suitable and spatially defined spawning areas have not been determined through surveys for the majority of the marine, estuarine, and fresh water species included in this atlas. Spawning information for these species' life history is contained in the 'general distribution' polygons to capture seasons in which spawning, eggs, and larvae are likely to be present. Exceptions include anadromous species which have known spawning locations.

This atlas does not contain all of the fish species that are present in the Chesapeake Bay, in the coastal bays of Maryland and Virginia, or in the Atlantic Ocean. Some species, like killifish spp. (in Chesapeake Bay), butterfish, mummichog, and needlefish, were not included due to their ubiquitous nature in the bay and/or marine environment; while others species were not included due to lack of data or on the expert opinion of the scientists and data providers.

Expert contacts for Virginia fish*:

Name	Agency	City	Phone	Species
Eric Brittle	VDGIF	Chesapeake, VA	757/334-5075	Anadromous and Freshwater Fish
Alan Weaver	VDGIF	Richmond, SC	804/367-6795	Anadromous and Freshwater Fish
Bob Greenlee	VDGIF	Charles City, VA	804/829-6715	Atlantic and shortnose sturgeon
Katie May Laumann	VMRC	Newport News, VA	757)-247-2263	Atlantic sturgeon
Albert Spells	USFWS	Charles City, VA	804/829-5627	Atlantic and shortnose sturgeon
Jason Kahn	NOAA	Silver Springs, MD	301/427-8464	Atlantic sturgeon
Troy Tuckey	VIMS	Gloucester Point, VA	804/684-7328	Estuarine fish and striped bass
Mary C. Fabrizio	VIMS	Gloucester Point, VA	804/684-7308	Estuarine fish

Name	Agency	City	Phone	Species
Chris Bonzek	VIMS	Gloucester Point, VA	804/684-7291	Marine finfish
Debra Gauthier	VIMS	Gloucester Point, VA	804/684-7891	Marine finfish

***Note: this list is not meant to represent all fish experts for the region.**

Expert contacts for Maryland fish*:

Name	Agency	City	Phone	Species
Steve Doctor	MD DNR	Ocean City, MD	410/213-1531	Marine and estuarine fish
Angel Willey	MD DNR	Matapeake, MD	410/643-6801 x 2101	Marine and estuarine fish
Jim Thompson	MD DNR	Annapolis, MD	410/260-8269	Anadromous fish
Beth Versak	MD DNR	Annapolis, MD	410/260-8304	Striped bass
Paul Piavis	MD DNR	Annapolis, MD	410/643-6801	Estuarine and anadromous fish
Margaret McGinty	MD DNR	Annapolis, MD	410/260-8297	Estuarine and anadromous fish
Chuck Stence	MD DNR	Stevensville, MD	410/643-6788	Atlantic sturgeon
Steve Minkinnen	USFWS	Annapolis, MD	410/573-4506	Atlantic and shortnose sturgeon
Mike Mangold	USFWS	Annapolis, MD	410/573-4509	Atlantic and shortnose sturgeon
Matt Ashton	MD DNR	Annapolis, MD	410/260-8604	Freshwater fish
Scott Stranko	MD DNR	Annapolis, MD	410/260-8603	Freshwater fish

***Note: this list is not meant to represent all fish experts for the region.**

Major Data Sources Used: Fish

Funderburk, S.L., S.J. Jordan, J.A. Mihursky, and D. Riley, editors. 1991. Habitat requirements for Chesapeake Bay living resources (Revised edition). Chesapeake Bay Program, Annapolis, MD.

MD DNR. 2014. Coastal Bays Fisheries Investigation Trawl and Beach Seine Survey data, 2005-2014, spreadsheet.

MD DNR. 2014. Maryland Biological Stream Survey (MBSS) data, 2000-2014, spreadsheet.

MD DNR. 2015. Maryland river herring spawning and nursery habitats, vector digital data.

MD DNR. 2012. Maryland striped bass spawning areas, vector digital data.

Murdy, E.O. and J.A. Musick. 2013. Field guide to fishes of the Chesapeake Bay. The John Hopkins University Press, Baltimore, MD, 345 pp.

Stone, S.L., T.A. Lowery, J.D. Field, C.D. Williams, D.M. Nelson, S.H. Jury, M.E. Monaco and L. Andreasen. 1994. Distribution and abundance of fishes and invertebrates in Mid-Atlantic estuaries. ELMR Rep. No. 12. NOAA/NOS Strategic Environmental Assessments Division, Silver Spring, MD. 280 p.

The Nature Conservancy. 2015. Chesapeake Bay Fish Passage Prioritization Project data, vector digital data.

- USFWS. 2011. Maryland sturgeon reward program captures - Atlantic and shortnose sturgeon, spreadsheet
- VDGIF. 2015. Wildlife Environmental Review Map Service: Species Observation Database (SppObs), vector digital data.
- VIMS. 2014. VIMS Multispecies Research Group, Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) data, 2005-2014, spreadsheet.
- VIMS. 2014. VIMS Multispecies Research Group, Northeast Area Monitoring and Assessment Program (NEAMAP) data, 2005-2014, spreadsheet.
- VIMS. 2014. VIMS Recruitment Program Juvenile Fish and Blue Crab Trawl Survey data, 2005-2014, spreadsheet.

INVERTEBRATES

Invertebrates depicted in this atlas include selected marine and estuarine species of commercial, ecological, and/or conservation value. Blue crabs, clams, oysters, and shrimp support valuable commercial and/or recreational shellfisheries with Chesapeake Bay and the coastal waters of Virginia and Maryland.

Marine and Estuarine Invertebrate Species - Sources used to depict distribution and seasonality of invertebrate species include: personal interviews with resource experts from MD DNR, VDGIF, VA MRC and VIMS; fishery-independent sampling data provided by MD DNR, NEAMAP, ChesMMAP and VIMS; species observation datasets for Virginia; reports and hardcopy maps for soft clam and razor clam distributions in Maryland; and vector digital data covering oyster reef locations provided by VIMS and MD DNR and shellfish lease areas provided by VA MRC.

Blue crabs - Blue crab were initially mapped in Chesapeake Bay and the Atlantic Ocean using fishery-independent data for the time period 2005–2014 from NEAMAP, ChesMMAP, and VIMS Juvenile Fish and Blue Crab Trawl survey. Spatial data from Habitat Requirements for Chesapeake Bay Living Resources (Funderburk et al., 1991) was used to depict summer high density areas. Winter high density areas were mapped using independent fishery data from the Blue Crab Winter Dredge survey (2009–2010) provided by VIMS. Spatial distributions in the coastal bays of Maryland and Virginia were mapped using expert knowledge from biologists at MD DNR and VIMS. Blue crab presence/absence data were then systematically reviewed and modified through consultations with MD DNR and VIMS scientists to the final distributions depicted on this ESI.

Chesapeake Bay Shellfish - Oysters and other commercially and/or recreationally important shellfish species, including hard clams, soft clams and stout razor clams, were mapped in Chesapeake Bay using a combination of independent fishery survey data, shellfish lease areas, reports and expert knowledge from MD DNR, VA MRC and VIMS. In Maryland, shellfish distributions were mapped using a combination of MD DNR Oyster Dredge Survey data (2005–2014), Maryland’s Historical Oyster Bottom vector digital data, the Assessment of Chesapeake Bay Commercial Softshell Clams (Homer et al., 2011), Habitat Requirements for Chesapeake Bay Living Resources (Funderburk et al., 1991), and expert opinion from MD DNR biologists. In Virginia, shellfish spatial distributions were mapped using VA MRC 2015 active shellfish lease data, Habitat Requirements for Chesapeake Bay Living Resources (Funderburk et al., 1991), and expert opinion from VA MRC and VIMS scientists.

Coastal Bays Shellfish - Oysters, stout razor clam and softshell clam distributions in the coastal bays of Maryland were mapped based on expert opinion of MD DNR. Hard clam distributions were mapped using data from MD DNR Coastal Hard Clam survey from 2004–2014. In Virginia’s coastal bays, oyster general distributions were based on shellfish lease digital data and expert opinion provided by VA MRC, and oyster reefs were mapped using digital data provided by VIMS (Ross et al., 2009), which had a resolution of approximately 1 m². The oyster reef polygons in this dataset were buffered by 25 m and

then merged together to conform to the minimum resolution requirements of the ESI maps and to take into account the growth and shifting nature of oyster reefs. Oyster reefs mapped in the ESI are not the only reefs that could occur in coastal areas, but represent current and potential oyster habitat.

Other Invertebrates - Distributions of other marine and estuarine invertebrates, including brown shrimp, white shrimp, mantis shrimp, and squid species were mapped in Chesapeake Bay and the Atlantic Ocean using data from NEAMAP, ChesMMAP, and VIMS Juvenile Fish and Blue Crab Trawl surveys from 2005–2014. Presence and absence of species was calculated using the NEAMAP, CHesMMAP and VIMS Juvenile Fish and Blue Crab survey data sets and followed the same methods outlined under the fish section (above). Additional invertebrate species with spatial distributions in the coastal bays of Maryland and Virginia and in marine waters (out to 12 nm), including life history traits, were based on expert knowledge provided by MD DNR, VA DGIF and VIMS. All marine and estuarine invertebrate spatial distributions and presence/absence data depicted in this ESI were systematically reviewed and finalized through consultations with MD DNR, VA MRC and VIMS scientists prior to inclusion.

Horseshoe crabs - Horseshoe crab spawning beaches were mapped from three different sources. In the Coastal Bays of Maryland, spawning beaches were identified using expert knowledge provided by Steve Doctor. Tom's Cove in the Chincoteague National Wildlife Refuge holds arguably the most important spawning habitat within the Chesapeake Bay and the Outer Coasts of Maryland and Virginia ESI. Spawning beaches in Tom's Cove were mapped from the Tom's Cove, Virginia Horseshoe Crab Tag Recovery Study Interim Report. Lastly, a number of small spawning sites within Chesapeake Bay itself were mapped using public sightings data provided by MD DNR. It should be noted that horseshoe crabs utilize whatever appropriate habitat is available inside Chesapeake Bay, and that these areas can shift over time. No comprehensive surveys for spawning beaches have been conducted, so the public sightings data are unlikely to capture all the ecologically significant areas.

Freshwater mussels - Freshwater mussels in Virginia and Maryland were mapped using VDGIF's Freshwater Mussel database, MD DNR's Ecologically Significant Areas database and the Maryland Biological Stream Survey data, respectively. Mussels mapped in Virginia represent rare species that are of conservation concern and are of significant ecological importance. Species observations mapped from the VDGIF database were restricted to the dates 1995–2013, and only include records that fell within 1000 m of ESI water bodies that are continuous to the ocean. Species mapped in Maryland have similar importance, but also include two endangered species: the dwarf wedgemussel (FE, MD SE) and the triangle floater (MD SE). Species mapped from MD DNR's Ecologically Significant Areas database are restricted based on date of last survey and include the years 1996 to 2016.

Insects - A number of insects of conservation concern were mapped in Maryland using MD DNR's Ecologically Significant Areas database. Records were selected based upon date of last survey and include data from 1996 to 2016. Insect species mapped from this database include three beetles: a darkling beetle, *Schoenicus puberulus* (MD SE); a helops darkling beetle, *Helops cisteloides* (MD SE); and the white tiger beetle, *Habroscelimorpha dorsalis media* (formerly *Cicindela dorsalis media*) (MD SE); and two species of butterfly: Palamedes swallowtail, *Papilio palamedes* (MD SE), and Selys' sunfly, *Helocordulia selysii* (MD ST). USFWS provided shapefiles depicting occurrences of FT/SE insects; common names were not included in the data tables for these species.

Tiger beetles - Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*, FT, MD SE, VA ST) occurrences in Virginia were mapped using a hard copy map from USFWS. On the eastern shore of Chesapeake Bay in Virginia, two sites account for more than 50% of the total population along that shore. These sites, Parker's Marsh and Savage Neck, have been marked as 'Concentration Areas' in the ESI database. The western shore harbors a smaller total population of northeastern beach tiger beetles, mostly due to recent hurricane events in 2003 and 2006, that seriously altered beach habitat and resulted in a large drop in population size. As of the last survey in 2008, approximately 10,000 tiger beetles were found on the western shore, as opposed to more than 38,000 beetles found on the eastern shore in 2005. Northeastern beach tiger beetles were also mapped in various parts of the study area according to expert knowledge.

Assateague National Seashore and USFWS National Wildlife Refuges - Resource experts provided distribution information for little white tiger beetle (*Ellipsoptera lepida*, MD SE), white tiger beetle (see above),

northeastern beach tiger beetle (see above), and monarch butterfly (*Danaus plexippus*) on federal lands for which they had information.

The species depicted in this atlas do not represent all of the invertebrate species present in this area of interest, including species like ribbed mussels which are ubiquitous to salt marsh habitats. Other invertebrate species, like blue mussels and some razor clam species which can be found in the coastal bays of Maryland and Virginia as juveniles, are also ecologically important as a food source for migrating birds and other invertebrate/fish species, but because of their ephemeral nature and lack of stable adult populations, were not included in this atlas.

Expert contacts for Chesapeake Bay and the outer coasts of Maryland and Virginia invertebrates*:

Name	Agency	City	Phone	Species/ Program
Steve Doctor	MD DNR	Ocean City, MD	410/213-1531	Horseshoe crabs and marine invertebrates
Marek Topolski	MD DNR	Annapolis, MD	410/260-8263	Chesapeake Bay horseshoe crabs
Andy Moser	USFWS	Annapolis, MD	410/573-4537	Tiger Beetles
Brian Watson	VDGIF	Forest, VA	434/525-7522	Freshwater mussels
Matt Ashton	MD DNR	Annapolis, MD	410/260-8604	Freshwater mussels
Lynn Davidson	MD DNR	Annapolis, MD	410/260-8563	Digital data provider
Mark Luckenback	VIMS	Gloucester Point, VA	804/684-7108	Marine and estuarine shellfish
Jim Wesson	VA MRC	Newport News, VA	757/247-2121	Marine and estuarine shellfish
Roger Mann	VA MRC	Gloucester Point, VA	804/ 684-7360	Marine and estuarine shellfish
Angel Willey	MD DNR	Matapeake, MD	410/643-6801 X 2101	Marine invertebrates
Mitch Tarnowski	MD DNR	Annapolis, MD	410/260-8258	Marine and estuarine shellfish
Ben Stagg	VA MRC	Newport News, VA	757-247-2225	Oysters
Leslie Gerlich	USFWS	Annapolis, MD	410/573-4587	Federal T/E species

***Note: this list is not meant to represent all invertebrate experts for the region.**

Major Data Sources Used: Invertebrates

Funderburk, S.L., S.J. Jordan, J.A. Mihursky, and D. Riley, editors. 1991. Habitat requirements for Chesapeake Bay living resources (Revised edition). Chesapeake Bay Program, Annapolis, MD.

Hallerman, E. 2009. Tom's Cove, Virginia horseshoe crab tag recovery study: interim report. A report to permitting authorities: Assateague Island National Seashore, Chincoteague National Wildlife Refuge, Virginia Marine Resources Commission. Virginia Polytechnic Institute and State University, Blacksburg, VA.

Homer, M.L., C.F. Dungan, and M.L. Tarnowski. 2011. Assessment of Chesapeake Bay Commercial softshell clams, *Mya arenaria* and *Tagelus plebeius*, with emphasis on abundance and disease status. Maryland Department of Natural Resources, Award NA07NMF4570326.

MD DNR. 2016. Ecologically significant areas of Maryland, vector digital data.

- MD DNR. 2014. Maryland Biological Stream Survey (MBSS) data, *Elliptio complanata* occurrences, 1995-2014, spreadsheet.
- MD DNR. 2014. Maryland Department of Natural Resources Coastal Hard Clam Survey data, 2004-2014, spreadsheet.
- MD DNR. 2014. Maryland Department of Natural Resources Oyster Dredge Survey data, 2005-2014, spreadsheet.
- MD DNR. 1997. Maryland Department of Natural Resources Historical Oyster Bottom. Vector digital data.
- MD DNR. 2015. Maryland horseshoe crab spawning public siting data, 2007-2015, spreadsheet.
- Ross, P.G. and M.W. Luckenbach. 2009. Population assessment of Eastern Oysters (*Crassostrea virginica*) in the Seaside Coastal Bays, vector digital data.
- USFWS. 2011. Northeastern beach tiger beetle occupied habitat, Chesapeake Bay. Gloucester, VA.
- VDGIF. 2013. VDGIF Freshwater Mussel Database, 1995-2013, vector digital data.
- VA MRC. 2015. Virginia Shellfish Lease Areas. Vector digital data.
- VIMS. 2010. Blue Crab Winter Dredge Survey data, 2009-2010. Map images and spatial analyses.
- VIMS. 2014. VIMS Multispecies Research Group, Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) data, 2005-2014, spreadsheet.
- VIMS. 2014. VIMS Multispecies Research Group, Northeast Area Monitoring and Assessment Program (NEAMAP) data, 2005-2014. Spreadsheet. Tarnowski, Mitch (MD DNR). Shellfish distributions and life histories in Chesapeake Bay and the coastal bays of Maryland. Personal communication.
- VIMS. 2014. VIMS Recruitment Program Juvenile Fish and Blue Crab Trawl Survey data, 2005-2014, spreadsheet.

BENTHIC HABITATS

Benthic habitats mapped in the ESI atlas include submerged aquatic vegetation (SAV) in the Chesapeake Bay and Back Bay. SAV data for the Chesapeake Bay from 2010-2014 aerial surveys were provided by VIMS. VIMS categorized SAV density for each year for all survey locations using a scale from 1, very sparse (<10% cover), to 4, dense (70-100% cover). For the ESI, VIMS provided five years (2010-2014) of SAV data to account for interannual variation in bed size and density. The five years of data were layered and the resulting polygons were categorized as either “high” or “low” density based on whether a majority of the years (three or more years) had high density categories (3 or 4) or low density categories (1 or 2). Areas with a density category of 0 for all five years were not mapped. Areas with one or two 0 density years were assigned to the ESI “high” or “low” categories based on the density categories of the majority of remaining years. All areas with at least one year of SAV presence, regardless of density value, that was not already covered by the “high” and “low” polygons were mapped with a concentration of “ephemeral”. “High”, “low”, and “ephemeral” polygons were dissolved to make contiguous polygons. SAV in Back Bay was mapped where present using the SAV map of North Carolina and Southeastern Virginia originated by the North Carolina Division of Marine Fisheries and provided by Back Bay NWR. Submerged aquatic vegetation mapped in the ESI is comprised of a variety of species, and the species assemblages are often determined by salinity. The following table lists species assemblages known to occur in the Chesapeake Bay and the months when they are present. Density of all SAV communities in Chesapeake Bay peak in the summer months, and some species are present year-round (Moore et al., 2000). The SAV survey data provided were not species-specific, so all SAV mapped in the Chesapeake Bay were mapped as present year-round. Freshwater SAV communities defoliate and are not present in winter (Moore et al., 2000), so SAV in Back Bay, an oligohaline bay, was mapped only during months present for freshwater SAV.

SAV species assemblages and months present:

SAV community type	Species associations	Months present
<i>Zostera</i> Community	<i>Zostera marina</i> * <i>Ruppia maritima</i>	January – December
<i>Ruppia</i> Community	<i>Ruppia maritima</i> * <i>Potamogeton perfoliatus</i> <i>Potamogeton pectinatus</i> <i>Zannichellia palustris</i>	January – December
<i>Potamogeton</i> Community	<i>Potamogeton pectinatus</i> * <i>Potamogeton perfoliatus</i> * <i>Potamogeton crispus</i> <i>Elodea canadensis</i>	May – November
Freshwater Mixed Community	<i>Myriophyllum spicatum</i> * <i>Hydrilla verticillata</i> * <i>Vallisneria americana</i> * <i>Ceratophyllum demersum</i> <i>Heteranthera dubia</i> <i>Elodea canadensis</i> <i>Najas</i> spp. <i>Potamogeton crispus</i> <i>Potamogeton pusillus</i>	May – November

*Dominant species

Expert contacts for Chesapeake Bay and the outer coasts of Maryland and Virginia benthic habitats*:

Name	Agency	City	Phone	Species/ Program
Bob Orth	VIMS	Gloucester Point, VA	804/684-7392	SAV
David Wilcox	VIMS	Gloucester Point, VA	804/684-7088	SAV
Lauren Billodeaux Mowbray	USFWS	Virginia Beach, VA	757/301-7329 x3108	Back Bay NWR SAV
Geralyn Mireles	USFWS	Virginia Beach, VA	757/301-7329 x153	Back Bay NWR SAV

***Note: this list is not meant to represent all benthic habitat experts for the region.**

Major Data Sources Used: Benthic Habitats

Moore, K.A., D.J. Wilcox, and R.J. Orth. 2000. Analysis of the abundance of submersed aquatic vegetation communities in the Chesapeake Bay. *Estuaries* 23: 115-127.

North Carolina Division of Marine Fisheries, Habitat Protection Section, Albemarle-Pamlico Sound National Estuary Program Submerged Aquatic Vegetation (SAV) Mapping Partnership. 2008. SAV Map of North Carolina and Southeastern Virginia 2007-2008, vector digital data.

VIMS. 2015. SAV distribution, 2010-2014, vector digital data.

HABITATS

Plant Species and Sensitive Ecological Communities – The MD DNR provided the majority of data for rare, threatened, and endangered plant species from their Ecologically Significant Areas (ESAs) of Maryland database. Data from the ESAs came in the form of generalized polygons within which multiple threatened or endangered species can often be found. Species include two federally listed species: seabeach amaranth (FT, VA ST, MD SE) and sensitive joint-vetch (FT, VA ST, MD SE) as well as numerous Maryland state listed species. To simplify display of these data, species names were generalized to reflect the Maryland state status with one of two designations, either ‘threatened plant’ or ‘endangered plant’. When more than one threatened or endangered species is found in the same polygon, this is recorded in the concentration field of the attribute table. For example, if two distinct endangered plants occur in the same polygon, this would result in a single record attributed with ‘2 species present’ in the concentration field. If there is no attribute in the concentration field, than only a single species is present.

State threatened plant genera mapped in Maryland:

<i>Antennaria</i>	<i>Linum</i>	<i>Sclerolepis</i>
<i>Carex</i>	<i>Lygodium</i>	<i>Scutellaria</i>
<i>Chamaedaphne</i>	<i>Lysimachia</i>	<i>Smilax</i>
<i>Chelone</i>	<i>Paspalum</i>	<i>Solidago</i>
<i>Diplazium</i>	<i>Phemeranthus</i>	<i>Sphenopholis</i>
<i>Eleocharis</i>	<i>Polygala</i>	<i>Stenanthium</i>
<i>Eriocaulon</i>	<i>Rhynchospora</i>	<i>Thelypteris</i>
<i>Eupatorium</i>	<i>Sagittaria</i>	
<i>Hypericum</i>	<i>Sanguisorba</i>	

State endangered plant genera mapped in Maryland:

<i>Aeschynomene</i>	<i>Equisetum</i>	<i>Leersia</i>	<i>Parnassia</i>	<i>Sesuvium</i>
<i>Agalinis</i>	<i>Eriocaulon</i>	<i>Lemna</i>	<i>Paspalum</i>	<i>Sida</i>
<i>Amaranthus</i>	<i>Eurybia</i>	<i>Liatris</i>	<i>Pedicularis</i>	<i>Sorghastrum</i>
<i>Aristida</i>	<i>Gaylussacia</i>	<i>Limnobium</i>	<i>Persea</i>	<i>Sporobolus</i>
<i>Asclepias</i>	<i>Glyceria</i>	<i>Limosella</i>	<i>Pluchea</i>	<i>Stachys</i>
<i>Bidens</i>	<i>Gymnopogon</i>	<i>Lipocarpa</i>	<i>Polanisia</i>	<i>Stellaria</i>
<i>Cardamine</i>	<i>Hasteola</i>	<i>Lithospermum</i>	<i>Polygonum</i>	<i>Symphyotrichum</i>
<i>Carex</i>	<i>Helianthemum</i>	<i>Litsea</i>	<i>Potamogeton</i>	<i>Tephrosia</i>
<i>Ceratophyllum</i>	<i>Hexastylis</i>	<i>Lobelia</i>	<i>Prenanthes</i>	<i>Trachelospermum</i>
<i>Chamaecrista</i>	<i>Honckenya</i>	<i>Ludwigia</i>	<i>Prunus</i>	<i>Triglochin</i>
<i>Cicuta</i>	<i>Hottonia</i>	<i>Lycopodiella</i>	<i>Pycnanthemum</i>	<i>Triosteum</i>
<i>Coelorachis</i>	<i>Hudsonia</i>	<i>Lysimachia</i>	<i>Ranunculus</i>	<i>Utricularia</i>
<i>Deschampsia</i>	<i>Hypericum</i>	<i>Lythrum</i>	<i>Rhynchospora</i>	<i>Valeriana</i>
<i>Desmodium</i>	<i>Iris</i>	<i>Matelea</i>	<i>Rumex</i>	<i>Veratrum</i>
<i>Dichanthelium</i>	<i>Juncus</i>	<i>Mecardonia</i>	<i>Sabatia</i>	<i>Xyris</i>
<i>Dryopteris</i>	<i>Krigia</i>	<i>Melothria</i>	<i>Sacciolepis</i>	<i>Zizaniopsis</i>
<i>Elatine</i>	<i>Kyllinga</i>	<i>Morella</i>	<i>Salix</i>	<i>Stellaria</i>
<i>Eleocharis</i>	<i>Lachnanthes</i>	<i>Nymphoides</i>	<i>Scleria</i>	<i>Symphyotrichum</i>
<i>Elephantopus</i>	<i>Lathyrus</i>	<i>Panicum</i>	<i>Scutellaria</i>	

Data for sensitive joint-vetch and seabeach amaranth in National Wildlife Refuges were provided through personal communication with USFWS staff and in NWR reports. Occurrences of seabeach amaranth within the Assateague Island National Seashore were provided by NPS staff. Additional occurrences of rare plant species within Chincoteague and Wallops Island National Wildlife Refuges were provided by USFWS staff via personal communication.

Expert contacts for Chesapeake Bay and the outer coasts of Maryland and Virginia rare plants*:

Name	Agency	City	Phone	Species/ Program
Jack Kumer	NPS	Berlin, MD	410/629-6070	Assateague Island NS
Lauren Billodeaux Mowbray	USFWS	Virginia Beach, VA	757/301-7329	Back Bay NWR
Kevin Holcomb	USFWS	Chincoteague, VA	757/336-6122	Chincoteague and Wallops Island NWRs
Lynn Davidson	MD DNR	Annapolis, MD	410/260-8563	Digital data provider

***Note: this list is not meant to represent all rare plant experts for the region.**

Major Data Sources Used: Habitats

MD DNR. 2016. Ecologically Significant Areas of Maryland, vector digital data.

USFWS. 2015. Eastern Virginia Rivers National Wildlife Refuge Complex – sensitive joint-vetch map.

INVASIVE SPECIES

The spread of invasive or non-native species can degrade habitat, increase the potential for crop damage and diseases in humans, livestock and natural resources, reduce biodiversity through competition and limit recreational opportunities. Invasive species often opportunistically spread after disturbance events alter the natural landscape. Oil spill response and clean up often alters the landscape in a manner conducive to the spread of invasive species as crews often mobilize from all over the U.S. in response to large scale spill events. Boats, trailers, waders and clean up equipment can spread invasive species from waterbody to waterbody unless properly cleaned after use. Invasive species that were mapped are shown on the HUMAN-USE RESOURCE maps.

TERRESTRIAL MAMMALS

Terrestrial mammals depicted in this atlas include bats, squirrels, shrews, horses, and otters. Species that are federally and state listed, and those that are vulnerable to oiling and response activities, are specifically emphasized. Threatened and endangered mammals include the Delmarva fox squirrel (VA SE, MD SE), and the Rafinesque's eastern big-eared bat (VA SE). Terrestrial mammal occurrence and seasonality information displayed in this atlas are based on data supplied by the USFWS, NPS, and VDGIF. Note that distributions for Delmarva fox squirrel's (VA SE, MD SE) are areas where they are likely to occur in their preferred habitat. Fox squirrels are primarily found in forests with mixed hardwoods and pines.

Expert contacts for Chesapeake Bay and the outer coasts of Maryland and Virginia terrestrial mammals*:

Name	Agency	City	Phone	Species
Jack Kumer	NPS	Berlin, MD	410/629-6070	Assateague Island NS
Lauren Billodeaux Mowbray	USFWS	Virginia Beach, VA	757/301-7329	Back Bay NWR
Jay Kapalczynski	VDGIF	Henrico, VA	804/367-6796	WERMS Database

***Note: this list is not meant to represent all terrestrial mammal experts for the region.**

Major Data Sources Used: Terrestrial Mammals

USFWS. 2008. Delmarva peninsula fox squirrel. Arlington, VA.

VDGIF. 2015. Wildlife environmental review map service, species observation database, vector digital data.

WILDLIFE REHABILITATION

The following contact provides veterinary care and/or retrieval of wildlife adversely affected by an event: Tri-State Bird Rescue & Research. 170 Possum Hollow Road, Newark, DE 19711. (302)-737-9543.





























HUMAN-USE RESOURCES

The human-use resources shown in this atlas were extracted from the ESI GIS data compiled for this region. The extracted features were mapped at scale of 1:100,000 and appear on the maps referenced by a number. For example, Map 1 will show the human-use features in conjunction with the ESI shoreline.

Management areas such as wildlife refuges and state parks are mapped as polygons. Where the feature is a known point location (e.g., marinas, airports, water intakes), the specific location is displayed.

Map IDs can be found in the accompanying data tables for point and polygon features mapped. The Map ID may provide more information (i.e., name, contact) for that particular resource. The types of human use resources mapped in this atlas are depicted below.

Note that some data provided by MD DNR, as part of their Ecologically Significant Areas (ESA) database, were included in the Essential Habitats resource. Species mapped this way include some of the most sensitive species in the ESA database. Many of these species are federally threatened or endangered. MD DNR considers these species so sensitive that they were unwilling to disclose species' names or what ESI element they represent. Without knowing the element these species fall under, they could not be mapped with the biological data.

	Abandoned Vessel		Marina
	Airport		Military Installation
	Anchorage		Mooring Site
	Aquaculture		National Estuarine Research Reserve
	Artificial Reef		National Park
	Beach		Nature Conservancy
	Boat Ramp		Park
	Commercial Fishing		Port
	Critical Habitat		Recreational Fishing
	EPA Facility		Repeated Measurement Site
	Ferry		State Protected Area
	Heliport		Tribal Land
	Historical Site		Water Intake
	Lock and Dam		Wildlife Refuge
	Management Area		

Abandoned Vessel: Data on locations of abandoned and derelict vessels comes from NOAA's Office of Coast Survey Automated Wrecks and Obstructions Information System (AWOIS).

Airport: Locations of airports, airfields, landing strips, etc. were downloaded from the National Transportation Atlas Databases maintained by the Federal Aviation Administration.

Anchorage: Locations where commercial vessels can be anchored offshore were provided by the NOAA Office for Coastal Management.

Aquaculture: Data were provided by the Center for Coastal Resources Management, Virginia Institute of Marine Science, College of William and Mary.

Army Corps of Engineers: U.S. Army Corps of Engineers (USACE) districts and divisions data were provided from the geospatial platform maintained by USACE.

Artificial Reef: Artificial reef data were provided by VA Department of Game and Inland Fisheries, MD DNR, The Nature Conservancy, and NOAA's Office of Coastal Management.

Beach: Locations of recreational beaches used for activities such as swimming, sun-bathing, fishing, etc. were mapped from expert knowledge.

Boat Ramp: Boat ramp location data were provided by the MD DNR, MD Geographic Information Office, VA Department of Conservation and Recreation, VA Department of Game and Inland Fisheries, and the Center for Coastal Resource Management at Virginia Institute of Marine Science, College of William and Mary.

Coast Guard: U.S. Coast Guard (USCG) stations were provided by the USCG and the U.S. Army Corps of Engineers. USCG polygonal district boundaries were provided by the USCG.

Commercial Fishing: Commercial pound net sites were provided by Maryland Department of Natural Resources.

County Boundary: Boundaries were downloaded from the U.S. Census Bureau MAF/TIGER (Topologically Integrated Geographic Encoding and Referencing) geographic database.

Critical Habitat: Designated Critical Habitat was mapped for the Maryland darter (*Etheostoma sellare*). Data were provided by the United States Fish and Wildlife Service.

Environmental Protection Agency Facility: Represents facilities required to file a Risk Management Plan (RMP) due to the presence of extremely hazardous substances that may result in a chemical accident. The data comes from the USEPA.

Environmental Protection Agency Region: Jurisdictional region boundaries were provided by the Environmental Protection Agency.

Essential Habitat: Essential habitat for Maryland's vulnerable, rare, threatened, and/or endangered species were obtained from MD Department of Natural Resources.

Federal Emergency Management Agency Region: Jurisdictional region boundaries were provided by the Federal Emergency Management Agency.

Ferry: U.S. Department of Transportation's Intermodal Passenger Connectivity Database provided ferry terminal data.

Fishery Area: Virginia's Baylor Grounds, public oyster grounds, were provided by the Center for Coastal Resources Management, Virginia Institute of Marine Science, College of William and Mary, in addition to the black drum and oyster management areas. Public Shellfish Fishing Areas in Maryland were mapped by MD DNR.

Heliport: Locations of heliports were downloaded from the National Transportation Atlas Databases maintained by the Federal Aviation Administration.

Historical Site: Historical sites were depicted from sites in the National Park Service National Register of Historic Places (2007) and MD State Historic Preservation Office (The Maryland Historical Trust).

Lock and Dam: Marine lock and dam system data were downloaded from the National Transportation Atlas Database.

Management Area: Management areas in this ESI atlas include: wildlife management areas, nature preserves, and conservation areas and were provided by the VA Department of Conservation and Recreation, VA Department of Game and Inland Fisheries, and MD DNR.

Marina: Marina location data were provided by MD DNR.

Military Installation: Military installation data were provided by the U.S. Census Bureau's MAF/TIGER (Topologically Integrated Geographic Encoding and Referencing) geographic database.

Mooring Site: NOAA's Electronic Navigational Charts (NOAA ENC's) provided mooring locations.

National Estuarine Research Reserve (NERR): NERR boundary data were provided by the Chesapeake Bay Virginia and Maryland NERR.

National Guard: Army National Guard Units were provided by Environmental Systems Research Institute, ArcGIS Online.

National Park: National Park boundaries were provided by the National Park Service (NPS).

Nature Conservancy: Boundaries of The Nature Conservancy (TNC) properties were obtained from TNC Lands database.

NOAA Facility: Locations of NOAA facilities were digitized as points from address matching and verified with Google Earth imagery.

Park: State park boundaries were provided by MA DNR and VA Department of Conservation and Recreation.

Pipeline: Natural gas inter/intrastate lines were provided by the U.S. Energy Information Association.

Port: Major port location data were compiled from ACE National Transportation Atlas databases.

Rail Route: Locations of railways were downloaded from the National Transportation Atlas Databases, maintained by the Department of Transportation.

Recreational Fishing: Recreational fishing locations were provided by Maryland DNR and Virginia Department of Game and Inland Fisheries.

Repeated Measurement Site: Repeated measurement sites obtained from NOAA include: national data buoy locations (DB), Mussel Watch monitoring sites (MWS), National Water Level Observation Network (NWLON), and Physical Oceanographic Real-Time System (PORTS). Water quality monitoring stations (WQ) were obtained from the Chesapeake Bay Program. The Long Term Ecological Research (LTER) Network provided the locations for their LTER Stations.

Road (or Bridge): Bridges were provided by NOAA Continually Updated Shoreline Product (CUSP) and also NOAA National Geodetic Survey's (NGS) Composite/National Shoreline Product.

Shipping Lane: Shipping lanes in U.S. waters were provided by NOAA's Coastal and Marine Spatial Planning office.

State (or State Border): State Borders were compiled from a variety of sources and verified by Research Planning, Inc.

State Protected Area: Areas that receive varied levels of state protection data were provided by VA Department of Game and Inland Fisheries, MD DNR, and NOAA's U.S. Marine Protected Areas Boundaries Inventory.

State Waters: State jurisdictional waters (low water mark extending 3 nm offshore) were derived from the Marine Cadastre, Coastal Zone Management Act offshore boundary.

Tribal Land: Tribal lands were downloaded from the U.S. Census Bureau's Census MAF/TIGER database.

Tunnel: Locations of tunnels were digitized as lines from information provided by Virginia Department of Transportation and Maryland Transportation Authority and verified with Google Earth imagery by Research Planning, Inc.

Washover: A washover, or washover fan, is a relatively flat surface on the top of a barrier spit complex that slopes gently landward. It is usually created when water, forced landward by breaking waves, flows across the top of the barrier spit during high spring tides or storms. This process creates a flattened-off surface along which sand is transported across the top of the spit into the standing water (lagoon) or marsh landward of the spit. The resulting deposit usually has a fan-like shape. Washover locations are represented by points that were digitized from ESRI World Imagery by Research Planning, Inc. at a scale of 1:8,000.

Waste Disposal: Locations represent ocean disposal sites of dredged material removed from the bottom of waterbodies in order to maintain navigation channels and berthing areas. Data were provided by NOAA's Office of Coastal Management.

Water Intake: Location of the fish hatchery water intake was provided by USFWS.

Wildlife Refuge: Twenty-one National Wildlife Refuges (NWR) fall within the ESI atlas. Locations of NWRs were provided by the U.S. Fish and Wildlife Service.

GEOGRAPHIC INFORMATION SYSTEM

All maps were produced using the ESI Geographic Information System (GIS) data compiled for this region. These data are stored as spatial data layers and associated databases. The format for the data varies depending on the type of information or features for which the data are being stored.

Under separate cover is a metadata document that details the data dictionary, processing techniques, data lineage, and other descriptive information for the digital datasets and maps that were used to create this atlas. Below is a brief synopsis of the information contained in the digital version. Refer to the metadata file for a full explanation of the data and its structure.

MAJOR ROADS

The major roads polyline layer represents major thoroughfares within the United States (ArcGIS Content Team (ESRI) and Tele Atlas North America Inc., U.S. Major Roads, ed. 10, published June 30, 2010, ESRI® Data & Maps series, Redlands, CA, USA). These roads are shown on the maps, but are not part of the underlying ESI GIS data.

SHORELINE CLASSIFICATIONS

The ESI shoreline habitat classification is stored as lines and polygons with associated attributes. In many cases, a shoreline may have two or three different classifications or colored lines on the shoreline. These multiple classifications are represented in the database by ESI#1/ESI#2, where ESI#1 is the landward-most classification and ESI#2 is the seaward-most classification. In addition to the line features, marshes (ESI=10A, ESI=10B), swamps (ESI=10C), and scrub-shrub wetlands (ESI=10D) are also stored as polygons.

SENSITIVE BIOLOGICAL RESOURCES

Biological resources are stored as points, lines and polygons. Associated with each feature is a unique identification number that is linked to a series of data tables that further identify the resources. The main biological resource table consists of a list of species identification numbers for each site, the concentration of each species at each site, a mapping qualifier, and identification codes for seasonality and source information. This data table is linked to other tables that describe the seasonality and life-history time periods for each species (at month resolution) for the specified map feature. Other data tables linked to the first table include: the species identification table, which includes common and scientific names; the species status table, which gives information for state and/or federal threatened or endangered listings; and the source database, which provides source metadata at the feature-species level (specific sources are listed for each species occurring at each mapped feature in the biology feature classes).

HUMAN-USE RESOURCES

Human-use features are represented as polygons, points or lines. Management areas such as wildlife refuges, national parks and state parks are mapped as polygons. Known locations such as marinas, high use beaches, airports and water intakes are displayed as points when security risks allow. Bridges and railroads are mapped as line features.

ACKNOWLEDGMENTS

This project was supported by the NOAA Office of Response and Restoration, Hazardous Materials Response Division, under the direction of Jill Petersen, NOAA's ESI Program Manager. The development of this atlas was part of a larger effort to update much of the Atlantic coast after the destruction caused by Hurricane Sandy in October 2012. Funding was provided by the Disaster Relief Appropriations Act of 2013. Frank Csulak (NOAA ERD/Scientific Support Coordinator) assisted greatly in all aspects of the project's completion. Cover photo provided by Joseph Fehrer of the Nature Conservancy.

The biological and human-use data included on the maps were provided by numerous individuals and agencies, including: CCB, MD DNR, NPS, NCBN, NOAA, SHARP, TNC, VAMSC, VCU, VADCR, VDGIF, VIMS, MRC, USFWS and others. Staff at these organizations contributed a vast amount of information to this effort, including first-hand expertise, publications, maps, and digital data.

At Research Planning, Inc. in Columbia, South Carolina, numerous scientific, GIS, and graphic staff were involved with different phases of the project. Mark White, GIS Director, and Christine Boring, Biology Dept. Manager, were co-Project Managers. The ESI shoreline was classified by Jennifer Horsman and Dr. Tim McClinton. The biological and human-use data were collected and compiled onto base maps by Christine Boring, Lauren Szathmary, Lincoln Smith, Michael Bauman, Mike Thompson, and Emily Watson. Lee Diveley, Katy Beckham, Jeff Dahlin, Emily Watson, Chris Locke, and Bryan Thom processed and produced the GIS data. Joe Holmes produced the final documents.

APPROPRIATE USE OF ATLAS AND DATA

This atlas and the associated database were developed to provide summary information on sensitive natural and human-use resources for the purposes of oil and chemical spill planning and response. Although the atlas and database should be very useful for other environmental and natural resource planning purposes, it should not be used in place of data held any contributing agencies. Likewise, information contained in the atlas and database cannot be used in place of consultations with natural and cultural resource agencies, or in place of field surveys. Also, this atlas should not be used for navigation.

SPECIES LIST

Common Name	Scientific Name	Common Name	Scientific Name
BENTHIC		BIRDS, cont.	
SAV		PASSERINE, cont.	
Submerged aquatic vegetation	-	Marsh passerine	-
BIRDS		Marsh wren	<i>Cistothorus palustris</i>
ALCID		Nelson's sharp-tailed sparrow	<i>Ammodramus nelsoni</i>
Alcids	-	Northern parula	<i>Setophaga americana</i>
DIVING		Prothonotary warbler	<i>Protonotaria citrea</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>	Purple martin	<i>Progne subis</i>
Brown pelican	<i>Pelecanus occidentalis</i>	Saltmarsh sharp-tailed sparrow	<i>Ammodramus caudacutus</i>
Common loon	<i>Gavia immer</i>	Savannah sparrow	<i>Passerculus sandwichensis</i>
Diving birds	-	Seaside sparrow	<i>Ammodramus maritimus</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>	Sedge wren	<i>Cistothorus platensis</i>
Grebes	-	Swamp sparrow	<i>Melospiza georgiana</i>
Horned grebe	<i>Podiceps auritus</i>	PELAGIC	
Pied-billed grebe	<i>Podilymbus podiceps</i>	Northern gannet	<i>Morus bassanus</i>
Red-necked grebe	<i>Podiceps grisegena</i>	Shearwaters	-
Red-throated loon	<i>Gavia stellata</i>	Storm-petrels	<i>Oceanodroma spp.</i>
GULL_TERN		RAPTOR	
<u>Black skimmer</u>	<i>Rynchops niger</i>	Bald eagle	<i>Haliaeetus leucocephalus</i>
Bonaparte's gull	<i>Larus philadelphia</i>	Northern harrier	<i>Circus cyaneus</i>
Caspian tern	<i>Hydroprogne caspia</i>	Osprey	<i>Pandion haliaetus</i>
Common tern	<i>Sterna hirundo</i>	Peregrine falcon	<i>Falco peregrinus</i>
Forster's tern	<i>Sterna forsteri</i>	Red-tailed hawk	<i>Buteo jamaicensis</i>
Great black-backed gull	<i>Larus marinus</i>	SHOREBIRD	
<u>Gull-billed tern</u>	<i>Gelochelidon nilotica</i>	American oystercatcher	<i>Haematopus palliatus</i>
Gulls	-	Black-bellied plover	<i>Pluvialis squatarola</i>
Herring gull	<i>Larus argentatus</i>	Common snipe	<i>Gallinago gallinago</i>
Laughing gull	<i>Larus atricilla</i>	Dowitchers	<i>Limnodromus spp.</i>
<u>Least tern</u>	<i>Sternula antillarum</i>	Dunlin	<i>Calidris alpina</i>
Ring-billed gull	<i>Larus delawarensis</i>	Greater yellowlegs	<i>Tringa melanoleuca</i>
<u>Roseate tern</u>	<i>Sterna dougallii</i>	Killdeer	<i>Charadrius vociferus</i>
<u>Royal tern</u>	<i>Thalasseus maximus</i>	Least sandpiper	<i>Calidris minutilla</i>
Sandwich tern	<i>Thalasseus sandvicensis</i>	Lesser yellowlegs	<i>Tringa flavipes</i>
Terns	-	Phalaropes	<i>Phalaropus spp.</i>
PASSERINE		<u>Piping plover</u>	<i>Charadrius melodus</i>
Coastal plain swamp sparrow	<i>Melospiza georgiana nigrescens</i>	<u>Red knot</u>	<i>Calidris canutus</i>
Le Conte's sparrow	<i>Ammodramus leconteii</i>	Ruddy turnstone	<i>Arenaria interpres</i>
		Sanderling	<i>Calidris alba</i>

SPECIES LIST

Common Name	Scientific Name	Common Name	Scientific Name
BIRDS, cont.		BIRDS, cont.	
SHOREBIRDS, cont.		WATERFOWL	
Semipalmated plover	<i>Charadrius semipalmatus</i>	American black duck	<i>Anas rubripes</i>
Semipalmated sandpiper	<i>Calidris pusilla</i>	American coot	<i>Fulica americana</i>
Shorebirds	-	American wigeon	<i>Anas americana</i>
Short-billed dowitcher	<i>Limnodromus griseus</i>	Blue-winged teal	<i>Anas discors</i>
Solitary sandpiper	<i>Tringa solitaria</i>	Brant	<i>Branta bernicla</i>
Spotted sandpiper	<i>Actitis macularia</i>	Bufflehead	<i>Bucephala albeola</i>
Stilt sandpiper	<i>Calidris himantopus</i>	Canada goose	<i>Branta canadensis</i>
Western sandpiper	<i>Calidris mauri</i>	Canvasback	<i>Aythya valisineria</i>
Whimbrel	<i>Numenius phaeopus</i>	Common goldeneye	<i>Bucephala clangula</i>
Willet	<i>Tringa semipalmata</i>	Common moorhen	<i>Gallinula chloropus</i>
<u>Wilson's plover</u>	<u><i>Charadrius wilsonia</i></u>	Dabbling ducks	-
Yellowlegs	<i>Tringa spp.</i>	Diving ducks	-
WADING		Gadwall	<i>Anas strepera</i>
American bittern	<i>Botaurus lentiginosus</i>	Geese	-
American woodcock	<i>Scolopax minor</i>	Greater scaup	<i>Aythya marila</i>
<u>Black rail</u>	<u><i>Laterallus jamaicensis</i></u>	Green-winged teal	<i>Anas crecca</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>	Hooded merganser	<i>Lophodytes cucullatus</i>
Cattle egret	<i>Bubulcus ibis</i>	Lesser scaup	<i>Aythya affinis</i>
Clapper rail	<i>Rallus longirostris</i>	Long-tailed duck	<i>Clangula hyemalis</i>
Glossy ibis	<i>Plegadis falcinellus</i>	Mallard	<i>Anas platyrhynchos</i>
Great blue heron	<i>Ardea herodias</i>	Mergansers	-
Great egret	<i>Ardea alba</i>	Northern pintail	<i>Anas acuta</i>
Green heron	<i>Butorides virescens</i>	Northern shoveler	<i>Anas clypeata</i>
King rail	<i>Rallus elegans</i>	Red-breasted merganser	<i>Mergus serrator</i>
Least bittern	<i>Ixobrychus exilis</i>	Redhead	<i>Aythya americana</i>
Little blue heron	<i>Egretta caerulea</i>	Ring-necked duck	<i>Aythya collaris</i>
Rails	-	Ruddy duck	<i>Oxyura jamaicensis</i>
Secretive marsh birds	-	Scaup	<i>Aythya spp.</i>
Snowy egret	<i>Egretta thula</i>	Scoters	<i>Melanitta spp.</i>
Sora	<i>Porzana carolina</i>	Snow goose	<i>Chen caerulescens</i>
Tricolored heron	<i>Egretta tricolor</i>	Surf scoter	<i>Melanitta perspicillata</i>
Virginia rail	<i>Rallus limicola</i>	Tundra swan	<i>Cygnus columbianus columbianus</i>
Wading birds		Waterfowl	-
White ibis	<i>Eudocimus albus</i>	Wood duck	<i>Aix sponsa</i>
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>	FISH	
		FISH	
		Alewife	<i>Alosa pseudoharengus</i>

SPECIES LIST

Common Name	Scientific Name	Common Name	Scientific Name
FISH, cont.		FISH, cont.	
American eel	<i>Anguilla rostrata</i>	Killifish	<i>Fundulus spp.</i>
American shad	<i>Alosa sapidissima</i>	Kingfishes	<i>Menticirrhus spp.</i>
Anchovies	-	Largemouth bass	<i>Micropterus salmoides</i>
Atlantic angel shark	<i>Squatina dumeril</i>	Lined seahorse	<i>Hippocampus erectus</i>
Atlantic croaker	<i>Micropogonias undulates</i>	Longnose gar	<i>Lepisosteus osseus</i>
Atlantic herring	<i>Clupea harengus</i>	Mullet	<i>Mugil spp.</i>
Atlantic mackerel	<i>Scomber scombrus</i>	Northern puffer	<i>Sphoeroides maculatus</i>
Atlantic menhaden	<i>Brevoortia tyrannus</i>	Northern searobin	<i>Prionotus carolinus</i>
Atlantic needlefish	<i>Strongylura marina</i>	Northern stargazer	<i>Astroscopus guttatus</i>
Atlantic sharpnose shark	<i>Rhizoprionodon terraenovae</i>	Pigfish	<i>Orthopristis chrysoptera</i>
Atlantic spadefish	<i>Chaetodipterus faber</i>	Pinfish	<i>Lagodon rhomboides</i>
<u>Atlantic sturgeon</u>	<u><i>Acipenser oxyrinchus</i></u>	Pipefish	<i>Syngnathus spp.</i>
Black crappie	<i>Pomoxis nigromaculatus</i>	Red drum	<i>Sciaenops ocellatus</i>
Black drum	<i>Pogonias cromis</i>	Red hake	<i>Urophycis chuss</i>
Black sea bass	<i>Centropristis striata</i>	Redfin pickerel	<i>Esox americanus americanus</i>
Blacktip shark	<i>Carcharhinus limbatus</i>	Sand tiger shark	<i>Carcharias taurus</i>
Blue catfish	<i>Ictalurus furcatus</i>	Sandbar shark	<i>Carcharhinus plumbeus</i>
Blueback herring	<i>Alosa aestivalis</i>	Scalloped hammerhead	<i>Sphyrna lewini</i>
Bluefish	<i>Pomatomus saltatrix</i>	Sheepshead	<i>Archosargus probatocephalus</i>
Bullhead catfish	<i>Ameiurus spp.</i>	Shorthead redhorse	<i>Moxostoma macrolepidotum</i>
Butterfish	<i>Peprilus triacanthus</i>	<u>Shortnose sturgeon</u>	<u><i>Acipenser brevirostrum</i></u>
Chain pickerel	<i>Esox niger</i>	Silver hake	<i>Merluccius bilinearis</i>
Channel catfish	<i>Ictalurus punctatus</i>	Silversides	-
Chesapeake logperch	<i>Percina bimaculata</i>	Smallmouth bass	<i>Micropterus dolomieu</i>
Clearnose skate	<i>Raja eglanteria</i>	Smooth butterfly ray	<i>Gymnura micrura</i>
Cobia	<i>Rachycentron canadum</i>	Smooth dogfish	<i>Mustelus canis</i>
Common carp	<i>Cyprinus carpio</i>	Southern flounder	<i>Paralichthys lethostigma</i>
Cownose ray	<i>Rhinoptera bonasus</i>	Southern stingray	<i>Dasyatis americana</i>
Crevalle jack	<i>Caranx hippos</i>	Spanish mackerel	<i>Scomberomorus maculatus</i>
Dusky shark	<i>Carcharhinus obscurus</i>	Spinner shark	<i>Carcharhinus brevipinna</i>
Eastern creek chubsucker	<i>Erimyzon oblongus</i>	Spiny dogfish	<i>Squalus acanthias</i>
Gizzard shad	<i>Dorosoma cepedianum</i>	Spot	<i>Leiostomus xanthurus</i>
Golden shiner	<i>Notemigonus crysoleucas</i>	Spotfin shiner	<i>Cyprinella spiloptera</i>
Great hammerhead	<i>Sphyrna mokarran</i>	Spottail shiner	<i>Notropis hudsonius</i>
Great white shark	<i>Carcharodon carcharias</i>	Spotted hake	<i>Urophycis regia</i>
Harvestfish	<i>Peprilus alepidotus</i>	Spotted seatrout	<i>Cynoscion nebulosus</i>
Hickory shad	<i>Alosa mediocris</i>	Striped bass	<i>Morone saxatilis</i>

SPECIES LIST

Common Name	Scientific Name	Common Name	Scientific Name
FISH, cont.		INVERTEBRATES	
Striped burrfish	<i>Cylichthys schoepfi</i>	BIVALVE	
Striped cusk-eel	<i>Ophidion marginatum</i>	Alewife floater	<i>Anodonta implicata</i>
Summer flounder	<i>Paralichthys dentatus</i>	Atlantic surfclam	<i>Spisula solidissima</i>
Sunfish	<i>Lepomis spp.</i>	Bay scallop	<i>Argopecten irradians</i>
Tautog	<i>Tautoga onitis</i>	Carolina slabshell	<i>Elliptio congrarea</i>
Tessellated darter	<i>Etheostoma olmstedii</i>	BIVALVE	
Thresher shark	<i>Alopias vulpinus</i>	Carolina spike	<i>Elliptio raveneli</i>
Walleye	<i>Stizostedion vitreum vitreum</i>	Creeper	<i>Strophitus undulatus</i>
Weakfish	<i>Cynoscion regalis</i>	<u>Dwarf wedgemussel</u>	<u><i>Alasmidonta heterodon</i></u>
White crappie	<i>Pomoxis annularis</i>	Eastern elliptio	<i>Elliptio complanata</i>
White perch	<i>Morone americana</i>	Eastern floater	<i>Pyganodon cataracta</i>
Winter flounder	<i>Pleuronectes americanus</i>	Eastern lampmussel	<i>Lampsilis radiata</i>
Yellow perch	<i>Perca flavescens</i>	Eastern oyster	<i>Crassostrea virginica</i>
HABITATS		Eastern pondmussel	<i>Ligumia nasuta</i>
PLANT		Elliptio complex	<i>Elliptio sp.</i>
<u>Endangered plant</u>	-	Hard clam	<i>Mercenaria mercenaria</i>
Rare plant community	-	Northern lance	<i>Elliptio fisheriana</i>
<u>Threatened plant</u>	-	Paper pondshell	<i>Utterbackia imbecillis</i>
WETLAND		Softshell clam	<i>Mya arenaria</i>
<u>Seabeach amaranth</u>	<u><i>Amaranthus pumilus</i></u>	Stout razor clam	<i>Tagelus plebeius</i>
<u>Sensitive joint-vetch</u>	<u><i>Aeschynomene virginica</i></u>	Tidewater mucket	<i>Leptodea ochracea</i>
HERPETOFAUNA		<u>Triangle floater</u>	<u><i>Alasmidonta undulata</i></u>
AMPHIBIAN		Variable spike	<i>Elliptio icterina</i>
<u>Barking treefrog</u>	<u><i>Hyla gratiosa</i></u>	Yellow lampmussel	<i>Lampsilis cariosa</i>
TURTLE		CEPHALOPOD	
<u>Chicken turtle</u>	<u><i>Deirochelys reticularia</i></u>	Squid	<i>Loligo spp.</i>
<u>Diamondback terrapin</u>	<u><i>Malaclemys terrapin</i></u>	CRAB	
<u>Green sea turtle</u>	<u><i>Chelonia mydas</i></u>	Atlantic rock crab	<i>Cancer irroratus</i>
<u>Kemp's ridley sea turtle</u>	<u><i>Lepidochelys kempii</i></u>	Blue crab	<i>Callinectes sapidus</i>
<u>Leatherback sea turtle</u>	<u><i>Dermochelys coriacea</i></u>	Hermit crab	<i>Pagurus spp.</i>
<u>Loggerhead sea turtle</u>	<u><i>Caretta caretta</i></u>	Horseshoe crab	<i>Limulus polyphemus</i>
<u>Snapping turtle</u>	<u><i>Chelydra serpentina</i></u>	Lady crab	<i>Ovalipes ocellatus</i>
		Knobbed whelk	<i>Busycon carica</i>
		<u>Darkling beetle</u>	<u><i>Schoenicus puberulus</i></u>
		<u>Federally threatened insect 1</u>	-
		<u>Federally threatened insect 2</u>	-

SPECIES LIST

Common Name	Scientific Name	Common Name	Scientific Name
INVERTEBRATES, cont.		TERRESTRIAL MAMMALS	
<u>Helops darkling beetle</u>	<u><i>Helops cisteloides</i></u>	BAT	
<u>Little white tiger beetle</u>	<u><i>Ellipsoptera lepida</i></u>	<u>Rafinesque's eastern big-eared bat</u>	<u><i>Corynorhinus rafinesquii macrotis</i></u>
Monarch butterfly	<i>Danaus plexippus</i>	SMALL MAMMAL	
<u>Northeastern beach tiger beetle</u>	<u><i>Cicindela dorsalis dorsalis</i></u>	<u>Delmarva fox squirrel</u>	<u><i>Sciurus niger cinereus</i></u>
<u>Palamedes swallowtail</u>	<u><i>Papilio palamedes</i></u>	Dismal swamp southeastern shrew	<i>Sorex longirostris fisheri</i>
<u>Selys' sunfly</u>	<u><i>Helocordulia selysii</i></u>	Northern river otter	<i>Lontra canadensis</i>
BIVALVE		UNGULATE	
<u>White tiger beetle</u>	<u><i>Habroscelimorpha dorsalis media</i></u>	Horse	<i>Equus caballus</i>
LOBSTER		* Underlined species are listed as either threatened or endangered under the federal ESA, and/or are listed as threatened, endangered, or special concern by Maryland and Virginia	
American lobster	<i>Homarus americanus</i>		
SHRIMP			
Brown shrimp	<i>Farfantepenaeus aztecus</i>		
Grass shrimp	<i>Palaemonetes spp.</i>		
Mantis shrimp	<i>Squilla empusa</i>		
Sand shrimp	<i>Crangon septemspinosa</i>		
White shrimp	<i>Litopenaeus setiferus</i>		
MARINE MAMMALS			
DOLPHIN			
Bottlenose dolphin	<i>Tursiops truncatus</i>		
Harbor porpoise	<u><i>Phocoena phocoena</i></u>		
Short-beaked common dolphin	<i>Delphinus delphis</i>		
MANATEE			
<u>West Indian manatee</u>	<u><i>Trichechus manatus</i></u>		
PINNIPED			
Gray seal	<i>Halichoerus grypus</i>		
Harbor seal	<i>Phoca vitulina</i>		
WHALE			
<u>Fin whale</u>	<u><i>Balaenoptera physalus</i></u>		
<u>Humpback whale</u>	<u><i>Megaptera novaeangliae</i></u>		
<u>North Atlantic right whale</u>	<u><i>Eubalaena glacialis</i></u>		

SHORELINE DESCRIPTIONS

EXPOSED, ROCKY SHORES

ESI = 1A

DESCRIPTION

- The intertidal zone is steep (greater than 30° slope), with very little width
- Sediment accumulations are uncommon and usually ephemeral, because waves remove the debris that has slumped from the eroding cliffs
- There are few attached plants or animals
- Less than 1% of shoreline

PREDICTED OIL BEHAVIOR

- Oil is held offshore by waves reflecting off the steep cliffs
- Any oil that is deposited is rapidly removed from exposed faces
- The most resistant oil would remain as a patchy band at or above the high-tide line

RESPONSE CONSIDERATIONS

- Cleanup is usually not required
- Access can be difficult and dangerous



SHORELINE DESCRIPTIONS

EXPOSED, SOLID MAN-MADE STRUCTURES

ESI = 1B

DESCRIPTION

- These structures are solid, man-made structures such as seawalls, groins, revetments, piers, and port facilities
- Many structures are constructed of concrete, wood, or metal
- Often there is no exposed substrate at low tide, but multiple habitats are indicated if present
- They are built to protect the shore from erosion by waves, boat wakes, and currents, and thus are exposed to rapid natural removal processes
- Attached animals and plants are sparse to moderate
- They are common in highly developed industrial and naval ports such as Norfolk and scattered along residential waterfronts, occurring along approximately 1% of the shoreline



PREDICTED OIL BEHAVIOR

- Oil is held offshore by waves reflecting off the steep, hard surface in exposed settings
- Oil readily adheres to the dry, rough surfaces, but it does not adhere to wet substrates
- The most resistant oil would remain as a patchy band at or above the high-tide line

RESPONSE CONSIDERATIONS

- Cleanup is usually not required
- High-pressure water spraying may be conducted to:
 - remove persistent oil in crevices;
 - improve aesthetics; or
 - prevent leaching of oil

SHORELINE DESCRIPTIONS

EXPOSED SCARPS AND STEEP SLOPES (CLAY)

ESI = 2B

DESCRIPTION

- These habitats generally occur along tidal channels and major river tributaries in the marsh where the currents cut a steep bank into the marsh soils
- Scarp heights vary from about 1 to 3 feet and usually consist of a heavily rooted, peaty soil
- May be fronted by a narrow beach of fine to medium-grained sand and/or shell fragments
- Low biological utilization because of strong currents and erosion
- Typically backed by wetland vegetation
- Very uncommon, comprising less than 1% of the shoreline



PREDICTED OIL BEHAVIOR

- Oil is not expected to adhere to the wet, impermeable clay surface
- There may be a thin band of oil left at or above the high water line

RESPONSE CONSIDERATIONS

- Cleanup is usually not required, because any stranded oil is quickly removed by wave action
- Access may be difficult

SHORELINE DESCRIPTIONS

FINE- TO MEDIUM-GRAINED SAND BEACHES

ESI = 3A

DESCRIPTION

- These beaches are flat to moderately sloping and relatively hard packed
- They are composed of predominantly quartz sand
- There can be heavy accumulations of wrack present
- They are utilized by birds and turtles
- Upper beach fauna include ghost crabs and amphipods; lower beach fauna can be moderate, but highly variable
- They are generally areas of heavy recreational use
- This shoreline type occurs along the outer coast and sporadic in the bay, comprising about 2% of the shoreline



PREDICTED OIL BEHAVIOR

- Light oil accumulations will be deposited as oily swashes or bands along the upper intertidal zone
- Heavy oil accumulations will cover the entire beach surface; oil will be lifted off the lower beach with the rising tide
- Maximum penetration of oil into fine- to medium-grained sand is about 10-15 cm
- Burial of oiled layers by clean sand within the first week after a spill typically will be less than 30 cm along the upper beach face
- Organisms living in the beach sediment may be killed by smothering or lethal oil concentrations in the interstitial water
- Biological impacts include temporary declines in infauna, which can affect important shorebird foraging areas

RESPONSE CONSIDERATIONS

- These beaches are among the easiest shoreline types to clean
- Cleanup should concentrate on removing oil and oily debris from the upper swash zone once oil has come ashore
- Traffic through both oiled and dune areas should be severely limited, to prevent contamination of clean areas
- Manual cleanup, rather than mechanical removal using road graders and front-end loaders, is advised to minimize the volume of sand removed from the shore and requiring disposal and replacement
- All efforts should focus on preventing the mixing of oil deeper into the sediments by vehicular and foot traffic
- Mechanical reworking of lightly oiled sediments from the high-tide line to the upper intertidal zone can be effective along outer beaches

SHORELINE DESCRIPTIONS

SCARPS AND STEEP SLOPES (SAND)

ESI = 3B

DESCRIPTION

- This shoreline type occurs where sandy bluffs are undercut by waves or currents and slump
- Some scarps are fronted by narrow beaches, if the erosion rates are moderate and episodic
- Trees growing at the top of these slopes are eventually undercut and the logs can accumulate at the base of the scarp
- Biological utilization by birds and infauna is low
- They are uncommon, comprising less than 1% of the shoreline



PREDICTED OIL BEHAVIOR

- Any stranded oil will concentrate at the high-water line and may penetrate sandy sediments
- Oil will also adhere to the dry surfaces of any logs that have accumulated at the base of the scarp
- There is little potential for burial except when major slumping of the bluff occurs
- Active erosion of the scarp will remove the oil

RESPONSE CONSIDERATIONS

- In most cases, removal of oiled sediments is not necessary because of the short residence time of the oil
- The need for removal of oiled sediments and debris should be carefully evaluated because of the potential for increased erosion
- Closely supervised manual labor should be used so that the minimal amount of material is removed during cleanup

SHORELINE DESCRIPTIONS

COARSE-GRAINED SAND BEACHES

ESI = 4

DESCRIPTION

- These beaches have moderate slopes, variable widths, and soft sediments. These characteristics combine to lower their trafficability
- Generally species density and diversity is lower than on fine-grained sand beaches
- They occur along 3% of the shoreline, mostly along banks of major rivers

PREDICTED OIL BEHAVIOR

- During small spills, oil will be deposited primarily as a band along the high-tide line
- Under very heavy accumulations, oil may spread across the entire beach face, though the oil will be lifted off the lower part of the beach with the rising tide
- Penetration of oil into coarse-grained sand can reach 25 cm
- Burial of oiled layers by clean sand can be as rapid as one tidal cycle and to depths of 60 cm or more
- Burial to depths over one meter is possible if the oil comes ashore at the start of a depositional period
- Biological impacts include temporary declines in infaunal populations, which can also affect important shorebird foraging areas



RESPONSE CONSIDERATIONS

- Remove oil primarily from the high tide line
- Removal of sediment should be limited to avoid erosion problems
- Mechanical reworking of the sediment into the surf zone may be used to release the oil without sediment removal
- Activity in the oiled sand should be limited to prevent mixing oil deeper into the beach
- Use of heavy equipment for oil/sand removal may result in the removal of excessive amounts of sand; manual cleanup may be more effective

SHORELINE DESCRIPTIONS

MIXED SAND AND GRAVEL BEACHES

ESI = 5

DESCRIPTION

- Moderately sloping beach composed of a mixture of sand and shell (shell component should comprise between 20 to 80 percent of total sediments)
- Because of the mixed sediment sizes and shapes, there may be zones of pure sand or shell
- They are uncommon, comprising approximately 1% of the shoreline



PREDICTED OIL BEHAVIOR

- During small spills, oil will be deposited along and above the high-tide swash
- Large spills will spread across the entire intertidal area
- Oil penetration into the beach sediments may be up to 50 cm; however, the sand fraction can be quite mobile, and oil behavior is much like on a sand beach if the sand fraction exceeds about 40%
- Burial of oil may be deep at and above the high-tide line, where oil tends to persist, particularly where beaches are only intermittently exposed to waves
- In sheltered pockets on the beach, pavements of asphalted sediments can form if there is no removal of heavy oil accumulations because most of the oil remains on the surface
- Once formed, these asphalt pavements can persist for years

RESPONSE CONSIDERATIONS

- Remove oil primarily from the high tide line
- Removal of sediment should be limited to avoid erosion problems
- Mechanical reworking of the sediment into the surf zone may be used to release the oil without sediment removal
- Activity in the oiled sediments should be limited to prevent mixing oil deeper into the beach
- Use of heavy equipment for oiled sediment removal may result in the removal of excessive amounts of sediment; manual cleanup may be more effective

SHORELINE DESCRIPTIONS

GRAVEL BEACHES

ESI = 6A

DESCRIPTION

- The gravel fraction is composed of shell fragments; they occur as lag deposits where the finer-grained sediments have been eroded away
- The shells tend to form steep, narrow berms or washover deposits
- Shell beaches occur along areas exposed to high waves or boat wakes, and they comprise less than 1% of the shoreline



PREDICTED OIL BEHAVIOR

- Deep penetration of stranded oil is likely on shell beaches because of their high permeability
- Long-term persistence will be controlled by the depth of routine reworking by waves or boat wakes
- Deeply penetrated oil can leach out for long periods

RESPONSE CONSIDERATIONS

- Heavy accumulations of pooled oil should be removed quickly from the upper beachface
- All oiled debris should be removed
- Sediment removal should be limited as much as possible
- Low-pressure flushing can be used to float fresh oil away from the sediments for recovery by skimmers or sorbents
- Heavily oiled shells may have to be removed and replaced with clean shells

SHORELINE DESCRIPTIONS

RIPRAP

ESI = 6B

DESCRIPTION

- Riprap structures are composed of cobble- to boulder-sized blocks of bedrock or concrete
- Riprap structures are used for shoreline protection and tidal- inlet stabilization
- Attached biota are sparse on exposed riprap and in fresh- to brackish-water areas
- Present along highly developed commercial waterfronts and residential areas, comprising about 3% of the shoreline



PREDICTED OIL BEHAVIOR

- Deep penetration of oil between the blocks is likely
- Oil adheres readily to the rough surfaces of the blocks
- Uncleaned oil can cause chronic leaching until the oil hardens

RESPONSE CONSIDERATIONS

- When the oil is fresh and liquid, high pressure spraying and/or water flooding may be effective, making sure to recover all mobilized oil
- Heavy and weathered oils are more difficult to remove, requiring scraping and/or hot-water spraying
- It may be necessary to remove heavily oiled blocks and replace them

SHORELINE DESCRIPTIONS

BOULDER RUBBLE

ESI = 6D

DESCRIPTION

- Relatively steep rocky shores with accumulations of angular boulder-sized rubble displaying limited evidence of re-working by waves or sediment transport
- Attached biota may be common at lower intertidal levels, whereas biota along the upper intertidal zones is sparse
- Can co-occur with gravel beaches or exposed rocky shorelines; associated gravel beaches can be either at the upper or the lower half of the intertidal zone, depending on the nature of the rock outcrop
- Relatively uncommon and found mostly on the Potomac River upstream from Washington, D.C., comprising less than 1% of the shoreline



PREDICTED OIL BEHAVIOR

- Oil tends to adhere to the high-water line where the rock surface dries out during low water
- On solid bedrock surfaces, the oil will occur as a surface coating
- Oil will pool and penetrate crevices in the surface rubble
- Where the rubble is loosely packed, oil can penetrate deeply, causing long-term contamination of the subsurface

RESPONSE CONSIDERATIONS

- Thick accumulations of pooled oil should be of high priority for removal, to prevent re-mobilization and/or penetration
- Manual removal of heavy oil is likely to leave significant residues, but may be useful for thick oil in crevices or sediment pockets

SHORELINE DESCRIPTIONS

EXPOSED TIDAL FLATS

ESI = 7

DESCRIPTION

- Exposed tidal flats are broad, flat intertidal areas composed primarily of sand and minor amounts of shell
- The presence of sand indicates that tidal currents and waves are strong enough to mobilize the sediments
- They are usually associated with another shoreline type on the landward side of the flat, though they can occur as separate shoals; they are commonly associated with tidal inlets
- Biological utilization can be very high, with large numbers of infauna, heavy use by birds for roosting and foraging, and use by foraging fish
- They occur along about 4% of the shoreline, most commonly on the eastern shore



PREDICTED OIL BEHAVIOR

- Oil does not usually adhere to the surface of exposed tidal flats, but rather moves across the flat and accumulates at the high-tide line
- Deposition of oil on the flat may occur on a falling tide if concentrations are heavy
- Oil does not penetrate water-saturated sediments
- Biological damage may be severe, primarily to infauna, thereby reducing food sources for birds and other predators

RESPONSE CONSIDERATIONS

- Currents and waves can be very effective in natural removal of the oil
- Cleanup is very difficult (and possible only during low tides)
- The use of machinery should be restricted to prevent mixing of oil into the sediments

SHORELINE DESCRIPTIONS

SHELTERED SCARPS (BEDROCK/MUD/CLAY)

ESI = 8A

DESCRIPTION

- This shoreline type is sheltered from wave activity and strong currents
- The slope of the intertidal zone is generally moderate to steep (greater than 15°) with little width
- These habitats are not common, occurring along the upper stretches of major rivers and comprising less than 1% of the shoreline

PREDICTED OIL BEHAVIOR

- Stranded oil will persist because of low energy setting
- There will be little potential for penetration into the clayey substrate

RESPONSE CONSIDERATIONS

- Low-pressure flushing at ambient temperatures is most effective when the oil is fresh and still liquid
- Where the high-tide area is accessible, it may be feasible to remove heavy oil accumulations and oiled debris



SHORELINE DESCRIPTIONS

SHELTERED, SOLID MAN-MADE STRUCTURES

ESI = 8B

DESCRIPTION

- These structures are solid man-made structures such as seawalls, groins, revetments, piers, and port facilities
- Most of the structures are designed to protect a single lot, thus their composition, design, and condition are highly variable
- Most structures are constructed of concrete, wood, or metal
- Often there is no exposed beach at low tide, but multiple habitats are indicated if present
- Attached animal and plant life can be moderate to high in salt-water areas
- They are common in highly developed commercial areas such as Norfolk and along residential waterfronts throughout the bay, comprising about 5% of the shoreline



PREDICTED OIL BEHAVIOR

- Oil will adhere readily to rough surfaces, particularly along the high-tide line, forming a distinct oil band
- The lower intertidal zone usually stays wet (particularly if algae covered), preventing oil from adhering to the surface

RESPONSE CONSIDERATIONS

- Cleanup of seawalls is usually conducted for aesthetic reasons or to prevent leaching of oil
- Low- to high-pressure spraying and high-volume deluge at ambient water temperatures is most effective when the oil is fresh

SHORELINE DESCRIPTIONS

SHELTERED RIPRAP

ESI = 8C

DESCRIPTION

- Riprap structures are composed of cobble- to boulder-sized blocks of bedrock or concrete
- These structures are found inside harbors and bays in developed areas, sheltered from direct exposure to waves
- Attached animal and plant life can be present
- They are common in highly developed commercial and residential waterfront areas, comprising 5% of the shoreline



PREDICTED OIL BEHAVIOR

- Deep penetration of oil between the boulders is likely
- Oil adheres readily to the rough surfaces
- If oil is left uncleaned, it may cause chronic leaching until the oil hardens

RESPONSE CONSIDERATIONS

- High-pressure spraying and high-volume deluge may be required to remove oil for aesthetic reasons and to prevent leaching of oil from the structure
- Cleanup crews should make sure to recover all released oil

SHORELINE DESCRIPTIONS

SHELTERED, ROCKY, RUBBLE SHORES

ESI = 8D

DESCRIPTION

- Relatively steep and narrow rocky shore that is covered by a veneer of angular rubble without any evidence of re-working by waves or sediment transport
- The surface rubble is highly variable in size and packing, but there is always some permeability in the surface materials
- Can co-occur with gravel beaches; the gravel beach can be either at the upper or the lower half of the intertidal zone, depending on the nature of the rock outcrop
- This shoreline type is sheltered from significant wave activity and strong currents
- They are uncommon, occurring along less than 1% of the shoreline



PREDICTED OIL BEHAVIOR

- Oil tends to adhere to the upper intertidal zone where the rock surface dries out during low tide, and the algal cover is sparse
- On solid bedrock surfaces, the oil will occur as a surface coating
- Oil will pool and penetrate crevices in the surface rubble
- Where the rubble is loosely packed, oil can penetrate deeply, causing long-term contamination of the subsurface

RESPONSE CONSIDERATIONS

- Thick accumulations of pooled oil should be of high priority for removal, to prevent re-mobilization and/or penetration
- Manual removal of heavy oil is likely to leave significant residues, but may be useful for oil in crevices or sediment pockets
- Flushing techniques will be most effective when oil is still fresh and liquid
- Expect to increase temperature and pressure over time as the oil weathers

SHORELINE DESCRIPTIONS

SHELTERED TIDAL FLATS

ESI = 9A

DESCRIPTION

- Sheltered tidal flats are composed primarily of mud with minor amounts of sand and shell
- They are present in calm-water habitats, sheltered from major wave activity, and are usually backed by marshes
- The sediments are very soft and cannot support even light foot traffic in many areas
- Sheltered tidal flats can be sparsely to heavily covered with algae and/or seagrasses
- They can have heavy wrack deposits along the upper fringe
- Large concentrations of shellfish, worms, and snails can be found on and in the sediments
- They are heavily utilized by birds for feeding
- Sheltered flats are common along most tidal channels, comprising 29% of the shoreline (the second most common habitat type)



PREDICTED OIL BEHAVIOR

- Oil does not usually adhere to the surface of sheltered tidal flats, but rather moves across the flat and accumulates at the high-tide line
- Deposition of oil on the flat may occur on a falling tide if concentrations are heavy
- Oil will not penetrate the water-saturated sediments, but could penetrate burrows or other crevices in muddy sediments
- In areas of high suspended sediments, sorption of oil can result in deposition of contaminated sediments on the flats
- Biological damage may be severe

RESPONSE CONSIDERATIONS

- These are high-priority areas necessitating the use of spill protection devices to limit impacts from both oil exposure and damage during response; deflection or sorbent booms and open water skimmers should be used
- Cleanup of the flat surface is very difficult because of the soft substrate; many methods may be restricted
- Low-pressure flushing and deployment of sorbents from shallow-draft boats may be attempted

SHORELINE DESCRIPTIONS

VEGETATED LOW BANKS

ESI = 9B

DESCRIPTION

- These habitats are either low banks with grasses or trees and tree roots exposed to the water
- They are flooded occasionally by high water
- These shorelines are most common along the major river tributaries and upper sections of tidal creeks to the bay and comprise 16% of the shoreline



PREDICTED OIL BEHAVIOR

- During low-water stages, oil will form a narrow band at the water level
- During high water, the oil will cover and coat the grasses and base of trees
- May cause loss of the grasses, but the trees should survive unless oil penetrates and persists in the substrate

RESPONSE CONSIDERATIONS

- Low-pressure flushing of oiled areas is effective in removing moderate to heavy accumulations of liquid oil from along the banks
- Sorbent and containment boom should be placed on the water side of the cleanup operations to contain and collect oil outflow
- Low- to high-pressure flushing can be used to remove oil from tree roots and trunks, if deemed necessary in high-use areas

SHORELINE DESCRIPTIONS

SALT- AND BRACKISH-WATER MARSHES

ESI = 10A

DESCRIPTION

- These marshes contain emergent, herbaceous vegetation that is salt tolerant; they are often dominated by one species, such as *Spartina alterniflora*
- Width of the marsh can vary widely, from a narrow fringe to extensive areas
- Sediments are composed of organic muds except on the margins of islands where sand is abundant
- Exposed areas are located along bays with wide fetches and along heavily trafficked waterways
- Sheltered areas are not exposed to significant wave or boat wake activity
- Resident flora and fauna are abundant with numerous species with high utilization by birds, fish, and shellfish
- They are the most common shoreline type present, comprising 65% of the shoreline



PREDICTED OIL BEHAVIOR

- Oil adheres readily to intertidal vegetation
- The band of coating will vary widely, depending upon the water level at the time oil slicks are in the vegetation; there may be multiple bands
- Large slicks will persist through multiple tidal cycles and coat the entire stem from the high-tide line to the base
- If the vegetation is thick, heavy oil coating will be restricted to the outer fringe, although lighter oils can penetrate deeper, to the limit of tidal influence
- Medium to heavy oils do not readily adhere to or penetrate the fine sediments, but can pool on the surface or in burrows
- Light oils can penetrate the top few centimeters of sediment and deeply into burrows and cracks (up to one meter)

RESPONSE CONSIDERATIONS

- Under light oiling, the best practice is natural recovery; natural removal processes and rates should be evaluated prior to conducting cleanup
- Heavy accumulations of pooled oil can be removed by vacuum, sorbents, or low-pressure flushing; in situ burning maybe be considered in remote areas
- Cleanup activities should be carefully supervised to avoid vegetation damage
- Any cleanup activity must not mix the oil deeper into the sediments; trampling of the roots must be minimized
- Cutting of oiled vegetation should only be considered when other resources present are at great risk from leaving the oiled vegetation in place

SHORELINE DESCRIPTIONS

FRESHWATER MARSHES

ESI = 10B

DESCRIPTION

- These are grassy wetlands composed of emergent herbaceous vegetation; there can be a mix of species
- They occur upstream of brackish vegetation in the upper estuary and along creeks and rivers
- Those along major channels are exposed to strong currents and boat wakes; smaller channels tend to be sheltered
- Resident flora and fauna are abundant
- Present along tidal freshwater sections of rivers and large creeks, comprising 6% of the shoreline



PREDICTED OIL BEHAVIOR

- Oil adheres readily to the vegetation
- The band of coating will vary widely, depending upon the water level at the time oil slicks are in the vegetation; there may be multiple bands
- Most of the time, there will be a narrow band because of the small tidal range at the head of the estuary; the band can be very large during high-water events
- If the vegetation is thick, heavy oil coating will be restricted to the outer fringe, although lighter oils can penetrate deeper

RESPONSE CONSIDERATIONS

- Under light oiling, the best practice is natural recovery; natural removal processes and rates should be evaluated prior to conducting cleanup
- Heavy accumulations of pooled oil can be removed by vacuum, sorbents, or low-pressure flushing; in situ burning maybe be considered in remote areas
- Cleanup activities should be carefully supervised to avoid vegetation damage
- Any cleanup activity must not mix the oil deeper into the sediments. Trampling of the roots must be minimized
- Cutting of oiled vegetation should only be considered when other resources present are at great risk from leaving the oiled vegetation in place

SHORELINE DESCRIPTIONS

SWAMPS

ESI = 10C

DESCRIPTION

- Swamps consist of shrubs and hardwood forested wetlands, essentially flooded forests. Vegetation is taller, on average, than 20 feet
- The sediment tends to be silty clay with large amounts of organic debris
- They are seasonally flooded, though there are many low, permanently flooded areas
- Resident flora and fauna are abundant with numerous species
- This shoreline type occurs along low areas adjacent to the major tributaries and comprises about 7% of the shoreline



PREDICTED OIL BEHAVIOR

- Oil behavior depends on whether the swamp is flooded or not
- During floods, most of the oil passes through the forest, coating the vegetation at the waterline, which changes levels throughout the flood event
- Oiled woody vegetation is less sensitive than grasses to oil coating
- Some oil can be trapped and pooled on the floodplain as water levels drop
- Penetration into the floodplain soils is usually limited because of high water levels, saturated soils, muddy composition, surface organic debris, and vegetation cover
- Large amounts of oily debris can remain
- During dry periods, terrestrial spills flow downhill and accumulate in depressions or reach waterbodies

RESPONSE CONSIDERATIONS

- Under light oiling, the best practice is to let the area recover naturally
- Heavy accumulations of pooled oil can be removed by vacuum, sorbents, or low-pressure flushing. Care must be taken to prevent transporting oil to sensitive areas down slope or along shore during flushing operations
- Under stagnant water conditions, herding of oil with water spray may be needed to push oil to collection areas
- Oily debris can be removed where there is access
- Any cleanup activity must not mix the oil deeper into the sediments
- Live woody vegetation should not be cut

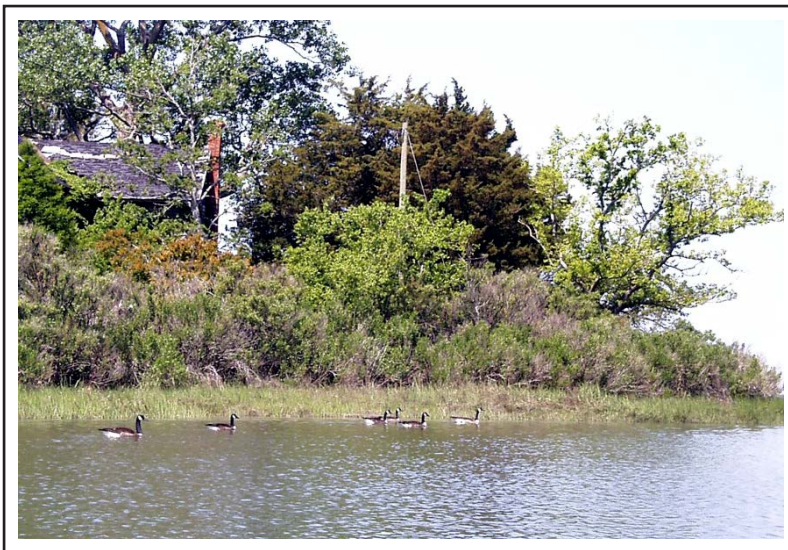
SHORELINE DESCRIPTIONS

SCRUB AND SHRUB WETLANDS

ESI = 10D

DESCRIPTION

- Scrub-shrub wetlands consist of woody vegetation less than 20 feet tall including true shrubs, small trees, and trees and shrubs that are stunted due to environmental conditions
- The sediments are silty clay mixed with organic debris
- They are seasonally flooded, though there are many low, permanently flooded areas
- Resident flora and fauna are abundant
- This habitat type occurs along about 2% of the shoreline



PREDICTED OIL BEHAVIOR

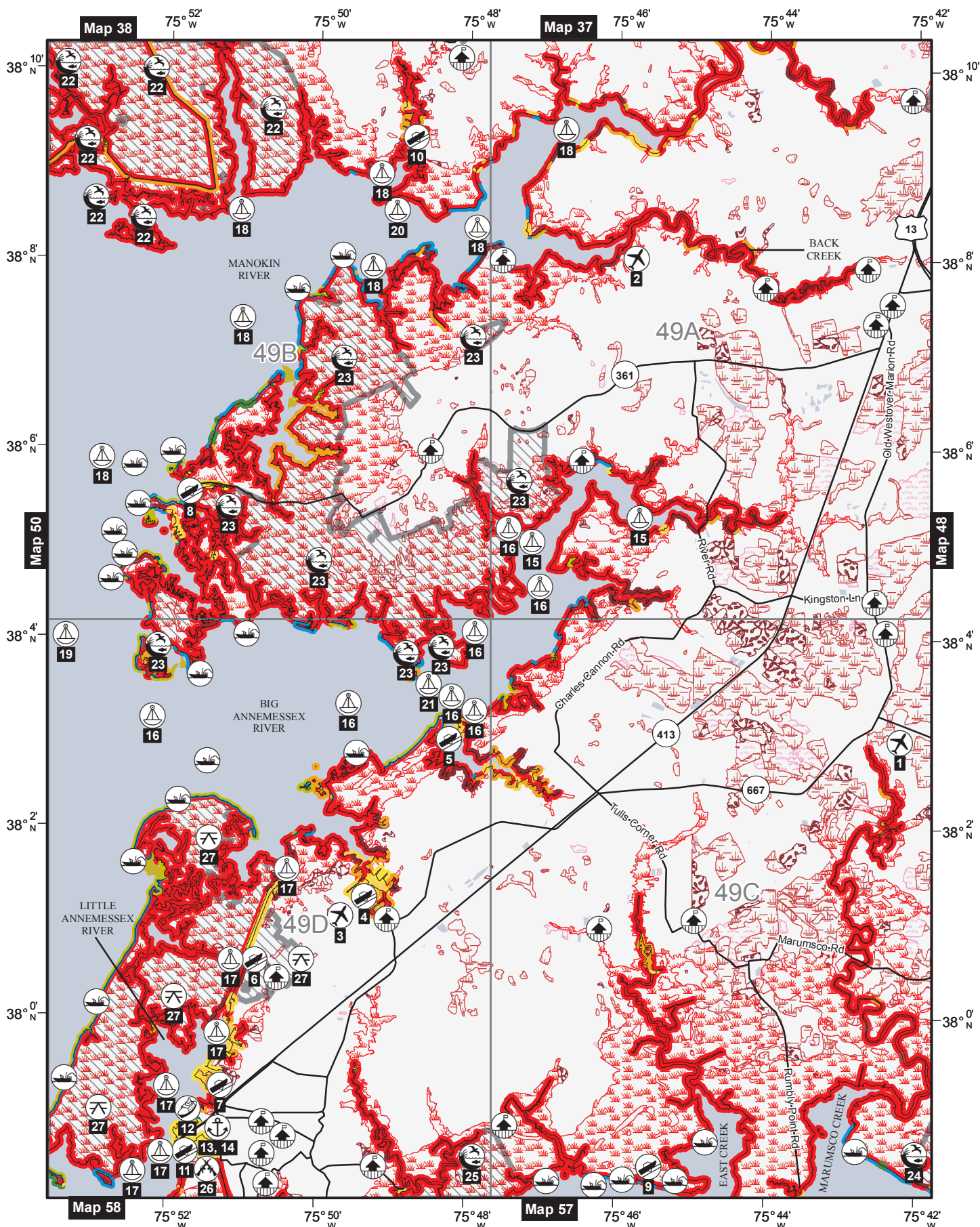
- Oil behavior depends on water level
- During high water, most of the oil passes through the forest, coating the vegetation above the waterline
- Woody vegetation is less sensitive than grasses to oil
- Some oil can be trapped and pooled on the floodplain as water levels drop
- Penetration into the floodplain soils is usually limited because of high water levels, muddy composition, surface organic debris, and vegetation cover
- Large amounts of oily debris can remain in the wetland
- During dry periods, terrestrial spills flow downhill and accumulate in depressions or reach waterbodies

RESPONSE CONSIDERATIONS

- Under light oiling, the best practice is natural recovery
- Heavy accumulations of pooled oil can be removed by vacuum, sorbents, or low-pressure flushing
- Under stagnant water conditions, herding of oil with water spray may be needed to push oil to collection areas
- Oily debris can be removed where there is access
- Any cleanup activity must not mix the oil deeper into the sediments. Trampling of the roots must be minimized
- Live woody vegetation should not be cut

ENVIRONMENTAL SENSITIVITY INDEX MAPS





Map 49 Central Bay



SEE BACK OF MAP
for details about mapped resources and
other resources that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 2 Miles
0 2 Kilometers

1:100,000



Map 49
Central Bay

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
Map ID	Type	Name	Contact
1	AIRPORT	ANDERSON FARM	
2	AIRPORT	BLUEMEL FIELD	
3	AIRPORT	CRISFIELD MUNI	
4	BOAT RAMP	BOAT RAMP	
5	BOAT RAMP	COULBOURN CREEK	SOMERSET COUNTY - ROADS DEPARTMENT
6	BOAT RAMP	JANES ISLAND STATE PARK	MARYLAND DNR - PARK SERVICE
7	BOAT RAMP	LITTLE BOAT HARBOR	SOMERSET COUNTY - ROADS DEPARTMENT
8	BOAT RAMP	RUMBLEY	SOMERSET COUNTY - ROADS DEPARTMENT
9	BOAT RAMP	RUMBLY POINT	SOMERSET COUNTY - ROADS DEPARTMENT
10	BOAT RAMP	SAINT PETERS CREEK	SOMERSET COUNTY - ROADS DEPARTMENT
11	BOAT RAMP	SOMERS COVE	MARYLAND DEPARTMENT OF NATURAL RESOURCES
12	FERRY	CRISFIELD FERRY	
13	MARINA	CRISFIELD MARINE TERMINAL	MARYLAND DEPARTMENT OF NATURAL RESOURCES 877-620-8367
14	MARINA	SOMERS COVE MARINA	MARYLAND DEPARTMENT OF NATURAL RESOURCES 877-620-8367
15	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, BIG ANNAMESSEX RIV*	MARYLAND DEPARTMENT OF THE ENVIRONMENT 410-537-3608
16	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, BIG ANNAMESSEX	MARYLAND DEPARTMENT OF THE ENVIRONMENT 410-537-3608
17	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, LITTLE ANNAMESSEX	MARYLAND DEPARTMENT OF THE ENVIRONMENT 410-537-3608
18	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, MANOKIN RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT 410-537-3608
19	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, TANGIER SOUND	MARYLAND DEPARTMENT OF THE ENVIRONMENT 410-537-3608
20	REPEATED MEASUREMENT SITE	WQ - STATION ET8.1	CHESAPEAKE BAY PROGRAM 800-968-7229
21	REPEATED MEASUREMENT SITE	WQ - STATION ET9.1	CHESAPEAKE BAY PROGRAM 800-968-7229

DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Contact
22	MANAGEMENT AREA	DEAL ISLAND WMA	WILDLIFE AND HERITAGE SERVICE
23	MANAGEMENT AREA	FAIRMOUNT WMA	WILDLIFE AND HERITAGE SERVICE
24	MANAGEMENT AREA	MARYLAND MARINE PROPERTIES WMA	WILDLIFE AND HERITAGE SERVICE
25	MANAGEMENT AREA	POCOMOKE SOUND WMA	WILDLIFE AND HERITAGE SERVICE
26	MILITARY	COAST GUARD STATION CRISFIELD	
27	PARK	JANES ISLAND SP	MARYLAND PARK SERVICE

ALSO PRESENT IN MAPPED AREA (POINTS)			
Type	Name	Contact	Phone
COAST GUARD	ANT CRISFIELD		
COAST GUARD	CGC CHOKEBERRY		301-968-0971
COAST GUARD	STA CRISFIELD		410-968-0323

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
STATE PROTECTED AREA	BIG ANNEMESSEX SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	KITTS CREEK SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	MANOKIN RIVER SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367

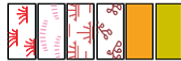
JURISDICTIONS

COUNTY:	SOMERSET COUNTY	FEMA:	REGION I
COAST GUARD:	DISTRICT 5, SECTOR BALTIMORE	EPA:	REGION 3
USACE:	NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT		

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	24,809.73	38.77
10B	Freshwater Marshes	1,041.36	1.63
10C	Swamps	6,056.84	9.46
10D	Scrub and Shrub Wetlands	1,201.55	1.88
9A	Sheltered Tidal Flats	2.85	0.00
7	Exposed Tidal Flats	130.11	0.20



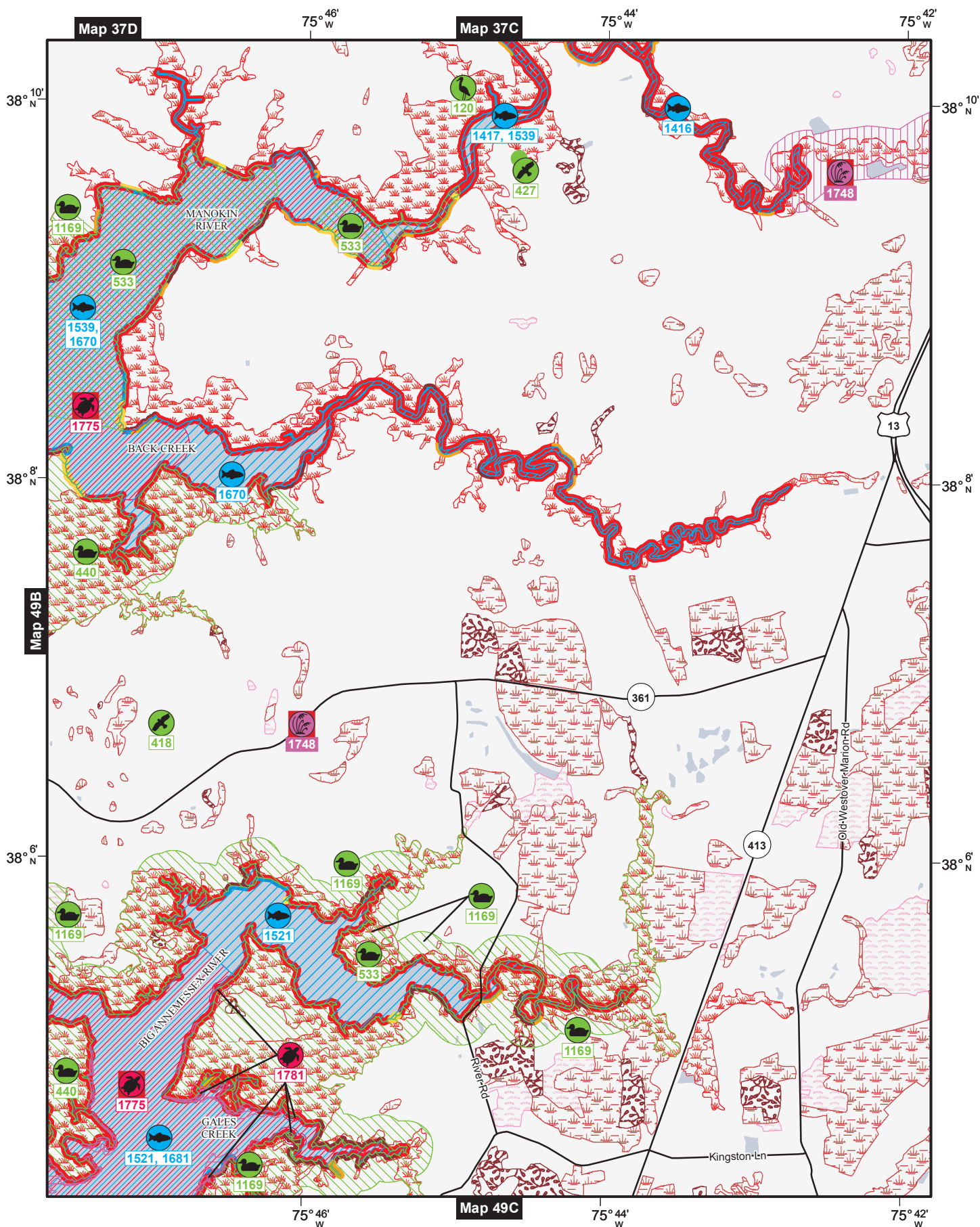
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	623,792.74	387.61	79%
10C	Swamps	281.85	0.18	< 1%
10D	Scrub and Shrub Wetlands	27,149.24	16.87	3%
9A	Sheltered Tidal Flats	17,138.82	10.65	2%
9B	Vegetated Low Banks	22,534.89	14.00	3%
8B	Sheltered, Solid Man-Made Structures	12,118.46	7.53	2%
8C	Sheltered Riprap	12,592.64	7.82	2%
7	Exposed Tidal Flats	26,306.18	16.35	3%
6A	Gravel Beaches	156.75	0.10	< 1%
6B	Riprap	1,560.07	0.97	< 1%
5	Mixed Sand and Gravel Beaches	70.73	0.04	< 1%
4	Coarse Grained Sand Beaches	42,844.70	26.62	5%
1B	Exposed, Solid Man-Made Structures	68.56	0.04	< 1%
Total ESI Shoreline:		786,615.62	488.78	
Total Shoreline:		651,265.76	404.68	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

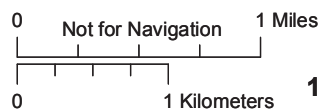




Map 49A Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



Map 49A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		High												
SAV	Submerged aquatic veg	High Ecological Value		Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence										Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N			
120	Wading	Great blue heron	Nesting		5 Nests														
418	Raptor	Bald eagle	Nesting		Last Obs. 2004														
427	Raptor	Bald eagle	Nesting		Last Obs. 1994														
440	Waterfowl	American black duck	Nesting		Moderate														
533	Waterfowl	Bufflehead	Wintering		1,000S														
	Waterfowl	Canada goose	Wintering		100S														
	Waterfowl	Canvasback	Wintering		1,000S														
	Waterfowl	Common goldeneye	Wintering		10S														
	Waterfowl	Mergansers	Wintering		100S														
	Waterfowl	Redhead	Wintering		1,000S														
	Waterfowl	Ring-necked duck	Wintering		10S														
	Waterfowl	Ruddy duck	Wintering		1,000S														
	Waterfowl	Scaup	Wintering		100S														
	Waterfowl	Snow goose	Wintering		1,000S														
	Waterfowl	Tundra swan	Wintering		100S														
1169	Waterfowl	American black duck	Nesting		Moderate-High														

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence										Spawn	Eggs	Larvae	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N				
1416	Diadromous	Alewife	Nursery Area		-															
	Diadromous	Alewife	Spawning Area		-															
	Diadromous	American shad	Nursery Area		-															
	Diadromous	American shad	Spawning Area		-															
	Diadromous	Blueback herring	Nursery Area		-															
	Diadromous	Blueback herring	Spawning Area		-															
	Diadromous	Hickory shad	Nursery Area		-															
	Diadromous	Hickory shad	Spawning Area		-															
	Diadromous	Striped bass	Nursery Area		-															
	Diadromous	Striped bass	Spawning Area		-															

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1417	Freshwater	Yellow perch	Spawning Area			-												Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
	Diadromous	Alewife	Nursery Area			-												-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-												Mar-May	Mar-May	-	-	Mar-May
	Diadromous	American shad	Nursery Area			-												-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-												Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-												-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-												Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-												-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-												Apr-May	Apr-May	-	-	Feb-Jun
	Diadromous	Striped bass	Spawning Area			-												Apr-Jun	Apr-Jun	-	-	Mar-Jun
1521	Freshwater	Yellow perch	Spawning Area			-												Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1539	Diadromous	Striped bass	Nursery Area			-												-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-												Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1670	Diadromous	Alewife	Nursery Area			-												-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-												-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-												-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-												-	-	Apr-Jun	Apr-Oct	Mar-Jun
	Diadromous	Striped bass	Migration			-												-	-	-	-	Mar-Jun
1681	Diadromous	Alewife	Nursery Area			-												-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			-												-	-	May-Jul	May-Oct	Feb-Jun



HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Concentration	2 Species Present																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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1748	Plant	Endangered plant	Vulnerable Occurrence																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					


REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Concentration	Nest	Hatch	Internest	Juveniles	Adults
				S	F	E/E	J	F	M	A	M	J	J	A	S	O	N	D					
1775	Turtle	K. ridley sea turtle	General Distribution															Uncommon	-	-	-	Nov-Dec	-
	Turtle	K. ridley sea turtle	General Distribution															Common	-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution															Common	-	-	-	Nov-Dec	Nov-Dec
	Turtle	Loggerhead sea turtle	General Distribution															Abundant	-	-	-	Apr-Oct	Apr-Oct
1781	Turtle	Diamondback terrapin	Nesting															Possible Nest	May-Aug	-	-	Apr-Oct	Apr-Oct

BIRDS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			100S													-	-	-	-
		D. crested cormorant			1,000S													-	Mar-May	Aug-Nov	-
		Grebes			100S													-	-	-	-
		Red-throated loon			100S													-	-	-	-
		Northern gannet			100S													-	-	-	-
	Pelagic	American black duck			Low													Mar-Aug	-	-	Jul-Aug
	Waterfowl	American black duck			1,000S													-	-	-	-
		American coot			10S													-	-	-	-
		American wigeon			100S													-	-	-	-
		Canada goose			Moderate-High													Mar-Jun	-	-	Jul-Aug
		Gadwall			1,000S													-	-	-	-
		Green-winged teal			1,000S													-	-	-	-
		Long-tailed duck			100S													-	-	-	-
		Mallard			Moderate-High													Mar-Aug	-	-	Jul-Aug
		Mallard			1,000S													-	-	-	-
		Northern pintail			10S													-	-	-	-
		Northern shoveler			Present													-	-	-	-
		Scoters			10,000S													-	-	-	-
		Wood duck			Moderate-High													Mar-Jun	-	-	Jul-Aug

FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Atlantic sturgeon			-													-	-	-	-	Jan-Dec
	Estuarine Nursery	Shortnose sturgeon			E/E													-	-	-	-	Jan-Dec
		White perch			-													-	-	Apr-Jun	Jan-Dec	-

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Crab	Blue crab			Highly Abundant-Summ													-	-	-	-	Jun-Oct

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Manatee	West Indian manatee			Rare													-	-	-	-







TERRESTRIAL MAMMALS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Small Mammal	Delmarva fox squirrel			-													-	-	-	-

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-
	Seaside sparrow													May-Jul	-	-	-	-
	Clapper rail													Apr-Sep	-	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Jan-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

Subelement	Species	Monthly Presence											
		J	F	M	A	M	J	J	A	S	O	N	D
Crab	Blue crab												
	Horseshoe crab												

MARINE MAMMALS

Subelement	Species	Monthly Presence											
		J	F	M	A	M	J	J	A	S	O	N	D
Dolphin	Bottlenose dolphin												

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES		
ESI Rank	Habitat Classification	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	5.01
10B	Freshwater Marshes	0.76
10C	Swamps	3.56
10D	Scrub and Shrub Wetlands	0.58
7	Exposed Tidal Flats	0.00

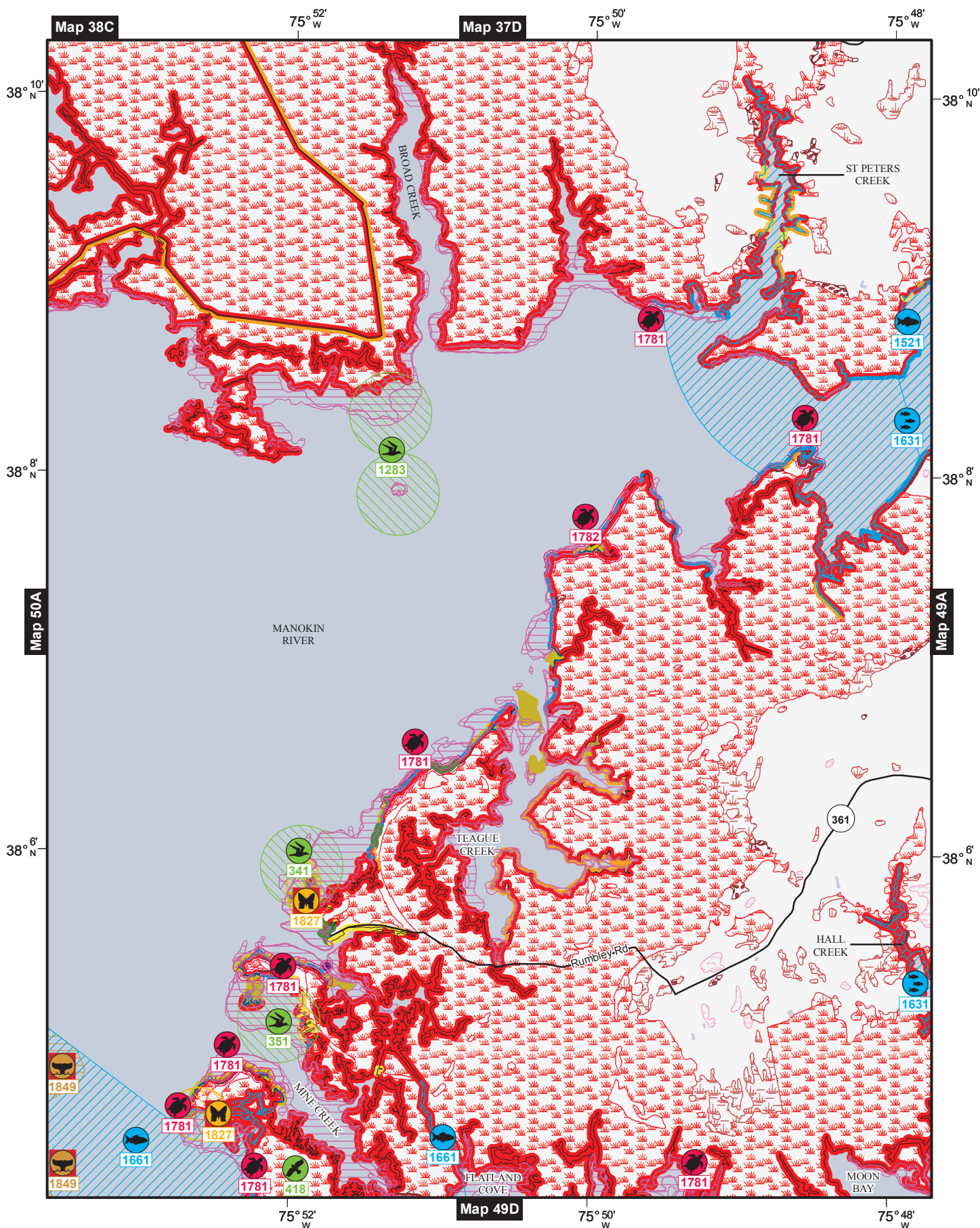
ESI SHORELINE HABITAT TYPES		
ESI Rank	Shoreline Habitat Classification	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	85%
10D	Scrub and Shrub Wetlands	9%
9B	Vegetated Low Banks	3%
8B	Sheltered, Solid Man-Made Structures	< 1%
8C	Sheltered Riprap	1%
7	Exposed Tidal Flats	< 1%
4	Coarse Grained Sand Beaches	2%

Total ESI Shoreline: 122,214.85
Total Shoreline: 105,921.90

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 49B
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 1 Miles
0 1 Kilometers

1:50,000



Map 49B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												
			S	F		J	F	M	A	M	J	J	A	S	O	N	D	
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral													
SAV	Submerged aquatic veg	High Ecological Value			High													
SAV	Submerged aquatic veg	High Ecological Value			Low													

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence																Hatch	Intersect	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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INVERTEBRATES



Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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MARINE MAMMALS


Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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1849	Whale	Humpback whale	General Distribution																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			100S													-	-	-	-
		D. crested cormorant			1,000S													-	Mar-May	Aug-Nov	-
		Grebes			100S													-	-	-	-
	Pelagic	Red-throated loon			100S													-	-	-	-
		Northern gannet			100S													-	-	-	-
	Waterfowl	American black duck			Moderate													Mar-Aug	-	-	Jul-Aug
		American black duck			Moderate-High													Mar-Aug	-	-	Jul-Aug
		American black duck			1,000S													-	-	-	-
		American coot			10S													-	-	-	-
		American wigeon			100S													-	-	-	-
		Bufflehead			1,000S													-	-	-	-
		Canada goose			Moderate-High													Mar-Jun	-	-	Jul-Aug
		Canada goose			100S													-	-	-	-
		Canvasback			1,000S													-	-	-	-
		Common goldeneye			10S													-	-	-	-
		Gadwall			1,000S													-	-	-	-
		Green-winged teal			1,000S													-	-	-	-
		Long-tailed duck			100S													-	-	-	-
		Mallard			Moderate-High													Mar-Aug	-	-	Jul-Aug
		Mallard			1,000S													-	-	-	-
		Mergansers			100S													-	-	-	-
		Northern pintail			10S													-	-	-	-
		Northern shoveler			Present													-	-	-	-
		Redhead			1,000S													-	-	-	-
		Ring-necked duck			10S													-	-	-	-
		Ruddy duck			1,000S													-	-	-	-
		Scaup			100S													-	-	-	-
		Scoters			10,000S													-	-	-	-
		Snow goose			1,000S													-	-	-	-
		Tundra swan			100S													-	-	-	-
		Wood duck			Moderate-High													Mar-Jun	-	-	Jul-Aug

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Atlantic sturgeon	General Distribution	-	E	-													-	-	-	-	Jan-Dec
	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Jan-Dec
	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-													-	-	-	-	Mar-Jun
	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle	General Distribution	E/E	E	Common													-	-	-	Apr-Oct	-
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	-	Nov-Dec	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct
	Blue crab																					

MARINE MAMMALS




Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Manatee	General Distribution	-	E	Rare													-	-	-	-
	West Indian manatee																				

TERRESTRIAL MAMMALS






Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Small Mammal	General Distribution			-													-	-	-	-
	Delmarva fox squirrel																				

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)



BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Brown pelican																-	-	-	-
		D. crested cormorant																-	-	-	-
	Gull/Tern	Gulls																-	-	-	-
		Terns																-	-	-	-
	Passerine	Saltmarsh sharp-tailed sparrow																May-Aug	-	-	-
		Seaside sparrow																May-Jul	-	-	-
	Shorebird	Willet																May-Jul	-	-	-
	Wading	Clapper rail																Apr-Sep	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Jan-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jan-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	9,704.47	15.16
10B	Freshwater Marshes	31.42	0.05
10C	Swamps	302.88	0.47
10D	Scrub and Shrub Wetlands	50.49	0.08
9A	Sheltered Tidal Flats	2.85	0.00
7	Exposed Tidal Flats	57.00	0.09

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	229,887.61	142.85	82%
10D	Scrub and Shrub Wetlands	4,593.04	2.85	2%
9A	Sheltered Tidal Flats	8,351.00	5.19	3%
9B	Vegetated Low Banks	10,844.57	6.74	4%
8B	Sheltered, Solid Man-Made Structures	1,234.89	0.77	< 1%
8C	Sheltered Riprap	1,033.66	0.64	< 1%
7	Exposed Tidal Flats	7,271.83	4.52	3%
6B	Riprap	1,142.33	0.71	< 1%
5	Mixed Sand and Gravel Beaches	70.73	0.04	< 1%
4	Coarse Grained Sand Beaches	14,910.45	9.26	5%
1B	Exposed, Solid Man-Made Structures	68.56	0.04	< 1%
Total ESI Shoreline:		279,408.67	Total ESI Shoreline: 173.62	
		233,762.71	Total Shoreline: 145.25	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 49C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		High												
SAV	Submerged aquatic veg	High Ecological Value		Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
418	Raptor	Bald eagle	Nesting		Last Obs. 2004												
484	Waterfowl	Wood duck	Nesting		Moderate-High												
487	Waterfowl	American black duck	Nesting		Moderate-High												
	Waterfowl	Wood duck	Nesting		Moderate-High												
533	Waterfowl	Bufflehead	Wintering		1,000S												
	Waterfowl	Canada goose	Wintering		100S												
	Waterfowl	Canvasback	Wintering		1,000S												
	Waterfowl	Common goldeneye	Wintering		10S												
	Waterfowl	Mergansers	Wintering		100S												
	Waterfowl	Redhead	Wintering		1,000S												
	Waterfowl	Ring-necked duck	Wintering		10S												
	Waterfowl	Ruddy duck	Wintering		1,000S												
	Waterfowl	Scaup	Wintering		100S												
	Waterfowl	Snow goose	Wintering		1,000S												
	Waterfowl	Tundra swan	Wintering		100S												
707	Raptor	Bald eagle	Roosting		-												
954	Waterfowl	Bufflehead	Wintering		1,000S												
	Waterfowl	Canvasback	Wintering		1,000S												
	Waterfowl	Mergansers	Wintering		100S												
	Waterfowl	Redhead	Wintering		10,000S												
	Waterfowl	Ring-necked duck	Wintering		Present												
	Waterfowl	Ruddy duck	Wintering		10,000S												
	Waterfowl	Scaup	Wintering		1,000S												
1089	Diving	Common loon	Wintering		100S												
	Diving	D. crested cormorant	Migration		1,000S												
	Diving	Grebes	Wintering		100S												
	Diving	Red-throated loon	Wintering		100S												
	Pelagic	Northern gannet	Wintering		100S												
	Waterfowl	Long-tailed duck	Wintering		100S												
	Waterfowl	Scoters	Wintering		10,000S												

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	
1164	Diving	Common loon	Wintering			Present												-
	Diving	Grebes	Wintering			10S												-
	Diving	Red-throated loon	Wintering			100S												-
	Pelagic	Northern gannet	Wintering			Present												-
	Waterfowl	Long-tailed duck	Wintering			100S												-
	Waterfowl	Scoters	Wintering			1,000S												-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	
1575	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-												Jan-Dec
1583	Diadromous	Alewife	Nursery Area			-												Mar-May
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												Jan-Dec
	Diadromous	Blackback herring	Nursery Area			-												May-Oct
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-												Jan-Dec
1631	Estuarine Nursery	White perch	Nursery Area			-												Jan-Dec
1664	Diadromous	Alewife	Migration			-												Mar-May
	Diadromous	Blueback herring	Migration			-												Aug-Nov
1666	Diadromous	American shad	Migration			-												Feb-Jun
	Diadromous	Hickory shad	Migration			-												Mar-Jun
	Diadromous	Striped bass	Migration			-												Jun-Oct
						-												Feb-Jun
						-												Mar-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-												-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	
1775	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common												-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common												Nov-Dec
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												Apr-Oct
1781	Turtle	Diamondback terrapin	Nesting			Possible Nest												Apr-Oct

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ												Jun-Oct

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MDVA			Monthly Presence															
			General Distribution	S	F	E	J	F	M	A	M	J	J	A	S	O	N	D	Mating	Calving	Pupping	Molt
1844	Manatee	West Indian manatee		-/E															-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

[illegible]

TERRESTRIAL MAMMALS

[illegible]






ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS



[illegible]

FISH


Monthly Presence

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D	Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	Alewife													-	-	-	Jan-May	Mar-May
	American eel																	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Bivalve																
	Cephalopod																
	Crab																
	Horseshoe crab																
	Brown shrimp																
	Mantis shrimp																
	White shrimp																

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D	May-Aug	May-Aug	-	-
	Bottlenose dolphin																
	Bottlenose dolphin																
	Harbor porpoise																

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES		
ESI Rank	Habitat Classification	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	10.45
10B	Freshwater Marshes	0.82
10C	Swamps	5.15
10D	Scrub and Shrub Wetlands	0.95
7	Exposed Tidal Flats	0.01

ESI SHORELINE HABITAT TYPES		
ESI Rank	Shoreline Habitat Classification	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	88%
10C	Swamps	< 1%
10D	Scrub and Shrub Wetlands	2%
9A	Sheltered Tidal Flats	2%
9B	Vegetated Low Banks	3%
8B	Sheltered, Solid Man-Made Structures	< 1%
8C	Sheltered Riprap	1%
7	Exposed Tidal Flats	1%
6B	Riprap	< 1%
4	Coarse Grained Sand Beaches	3%

Total ESI Shoreline: 123,889.88
Total Shoreline: 111,151.13

Total ESI Shoreline: 76.98
Total Shoreline: 69.07

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 49D
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence											
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral											
SAV	Submerged aquatic veg	High Ecological Value			High											
SAV	Submerged aquatic veg	High Ecological Value			Low											

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence											
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N
84	Gull/Tern	Forster's tern	Nesting			5 Pairs											
120	Wading	Great blue heron	Nesting			5 Nests											
422	Raptor	Bald eagle	Nesting			Last Obs. 2003											
533	Waterfowl	Bufflehead	Wintering			1,000S											
	Waterfowl	Canada goose	Wintering			100S											
	Waterfowl	Canvasback	Wintering			1,000S											
	Waterfowl	Common goldeneye	Wintering			10S											
	Waterfowl	Mergansers	Wintering			100S											
	Waterfowl	Redhead	Wintering			1,000S											
	Waterfowl	Ring-necked duck	Wintering			10S											
	Waterfowl	Ruddy duck	Wintering			1,000S											
	Waterfowl	Scaup	Wintering			100S											
	Waterfowl	Snow goose	Wintering			1,000S											
	Waterfowl	Tundra swan	Wintering			100S											
707	Raptor	Bald eagle	Roosting			-											
1169	Waterfowl	American black duck	Nesting			Moderate-High											

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence											
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N
1656	Diadromous	American shad	Nursery Area			-											
	Diadromous	Hickory shad	Nursery Area			-											
	Diadromous	Striped bass	Nursery Area			-											

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence											
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-											

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1754	Turtle	Diamondback terrapin	Nesting			-												May-Aug	-	-	Apr-Oct	Apr-Oct
1781	Turtle	Diamondback terrapin	Nesting			Possible Nest												May-Aug	-	-	Apr-Oct	Apr-Oct
1782	Turtle	Diamondback terrapin	Nesting			Probable Nest												May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES



Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1827	Insect	Federally threatened insect 1	Vulnerable Occurrence	E/T	T	-													Jun-Aug	Jun-Jul	Jan-Dec	-	Jun-Aug

MARINE MAMMALS


Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
1849	Whale	Humpback whale	General Distribution	E/E	E	Very Rare													-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon	Wintering			100S												-	-	-	-
		D. crested cormorant	Migration			1,000S												-	Mar-May	Aug-Nov	-
		Grebes	Wintering			100S												-	-	-	-
	Pelagic	Red-throated loon	Wintering			100S												-	-	-	-
		Northern gannet	Wintering			100S												-	-	-	-
	Waterfowl	American black duck	Nesting			Moderate												Mar-Aug	-	-	Jul-Aug
		American black duck	Wintering			1,000S												-	-	-	-
		American coot	Wintering			10S												-	-	-	-
		American wigeon	Wintering			100S												-	-	-	-
		Canada goose	Nesting			Moderate-High												Mar-Jun	-	-	Jul-Aug
		Gadwall	Wintering			1,000S												-	-	-	-
		Green-winged teal	Wintering			1,000S												-	-	-	-
		Long-tailed duck	Wintering			100S												-	-	-	-
		Mallard	Nesting			Moderate-High												Mar-Aug	-	-	Jul-Aug
		Mallard	Wintering			1,000S												-	-	-	-
		Northern pintail	Wintering			10S												-	-	-	-
		Northern shoveler	Wintering			Present												-	-	-	-
		Scoters	Wintering			10,000S												-	-	-	-
		Wood duck	Nesting			Moderate-High												Mar-Jun	-	-	Jul-Aug

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diadromous	Alewife			-													-	-	Aug-Nov	Mar-May
		Alewife			-													-	Apr-Jun	Apr-Oct	Mar-May
	American shad	Migration			-													-	-	Aug-Nov	Mar-Jun
	Atlantic sturgeon	Nursery Area			-													-	-	Aug-Nov	Mar-Jun
	Blueback herring	General Distribution	-/E	E	-													-	-	-	Jan-Dec
	Blueback herring	Migration			-													-	-	Aug-Nov	Feb-Jun
	Blueback herring	Nursery Area			-													-	May-Jul	May-Oct	Feb-Jun
	Hickory shad	Migration			-													-	-	Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-													-	-	-	Mar-Jun

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Turtle	General Distribution	E/E	E	Uncommon													-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	Apr-Oct	Apr-Oct

INVERTEBRATES





Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Crab	Concentration Area			Highly Abundant-Summ													-	-	Jun-Oct	Jun-Oct
	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Manatee	General Distribution	-/E	E	Rare													-	-	-	-
	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS





Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Brown pelican																-	-	-	-
		D. crested cormorant																-	-	-	-
	Gull/Tern	Gulls																-	-	-	-
		Terns																-	-	-	-
	Passerine	Saltmarsh sharp-tailed sparrow																May-Aug	-	-	-
		Seaside sparrow																May-Jul	-	-	-
	Shorebird	Willet																May-Jul	-	-	-
		Clapper rail																Apr-Sep	-	-	-

FISH

Monthly Presence

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Jan-May	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
Estuarine Nursery	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
Fish	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
Freshwater	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
Marine Pelagic	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES


Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bivalve													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Eastern oyster													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													May-Dec*	-	Jan-Dec	Jan-Dec
	Softshell clam													-	-	Jan-Dec	Jan-Dec
	Squid													Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES			Area (Sq. Miles)	
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)	
 10A	Salt and Brackish Water Marshes	5,213.16	8.15	
10B	Freshwater Marshes	2.32	0.00	
10C	Swamps	178.72	0.28	
10D	Scrub and Shrub Wetlands	167.58	0.26	
7	Exposed Tidal Flats	65.70	0.10	

ESI SHORELINE HABITAT TYPES					
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline	
 10A	Salt and Brackish Water Marshes	181,094.57	112.53	69%	
10D	Scrub and Shrub Wetlands	9,320.63	5.79	4%	
 9A	Sheltered Tidal Flats	6,698.89	4.16	3%	
 9B	Vegetated Low Banks	4,795.14	2.98	2%	
 8B	Sheltered, Solid Man-Made Structures	10,526.85	6.54	4%	
 8C	Sheltered Riprap	8,540.94	5.31	3%	
 7	Exposed Tidal Flats	17,588.16	10.93	7%	
 6A	Gravel Beaches	156.75	0.10	< 1%	
 6B	Riprap	307.21	0.19	< 1%	
 4	Coarse Grained Sand Beaches	22,073.08	13.72	8%	
Total ESI Shoreline:		261,102.23	Total ESI Shoreline:	162.24	
Total Shoreline:		200,430.03	Total Shoreline:	124.54	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 50
Central Bay

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	BOAT RAMP	DEAL ISLAND	SOMERSET COUNTY - ROADS DEPARTMENT	
2	BOAT RAMP	EWELL	SOMERSET COUNTY - ROADS DEPARTMENT	
3	BOAT RAMP	TYLERTON	SOMERSET COUNTY - ROADS DEPARTMENT	
4	BOAT RAMP	WENONA HARBOR PUBLIC BOAT RAMP	SOMERSET COUNTY - ROADS DEPARTMENT	
5	FERRY	EWELL FERRY		
6	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, CHESAPEAKE BAY	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
7	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, MANOKIN RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
8	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, TANGIER SOUND	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
9	REPEATED MEASUREMENT SITE	WQ - STATION EE3.2	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
10	MANAGEMENT AREA	DEAL ISLAND WMA	WILDLIFE AND HERITAGE SERVICE	
11	MANAGEMENT AREA	SOUTH MARSH ISLAND WMA	WILDLIFE AND HERITAGE SERVICE	
12	PARK	JANES ISLAND SP	MARYLAND PARK SERVICE	
13	WILDLIFE REFUGE	BLACKWATER NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE	410-228-2677
14	WILDLIFE REFUGE	MARTIN NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE	410-228-2692

ALSO PRESENT IN MAPPED AREA (POLYGONS)				
Type	Name	Contact	Phone	
STATE PROTECTED AREA	LOWER MAIN STEM BAY SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367	
STATE PROTECTED AREA	MANOKIN RIVER SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367	
STATE PROTECTED AREA	SOMERSET SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367	

JURISDICTIONS

COUNTY: DORCHESTER COUNTY, SOMERSET COUNTY
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT

FEMA: REGION I
EPA: REGION 3

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	12,843.99	20.07
10B	Freshwater Marshes	2.36	0.00
10C	Swamps	34.27	0.05
10D	Scrub and Shrub Wetlands	118.11	0.18
9A	Sheltered Tidal Flats	1.10	0.00
7	Exposed Tidal Flats	88.52	0.14

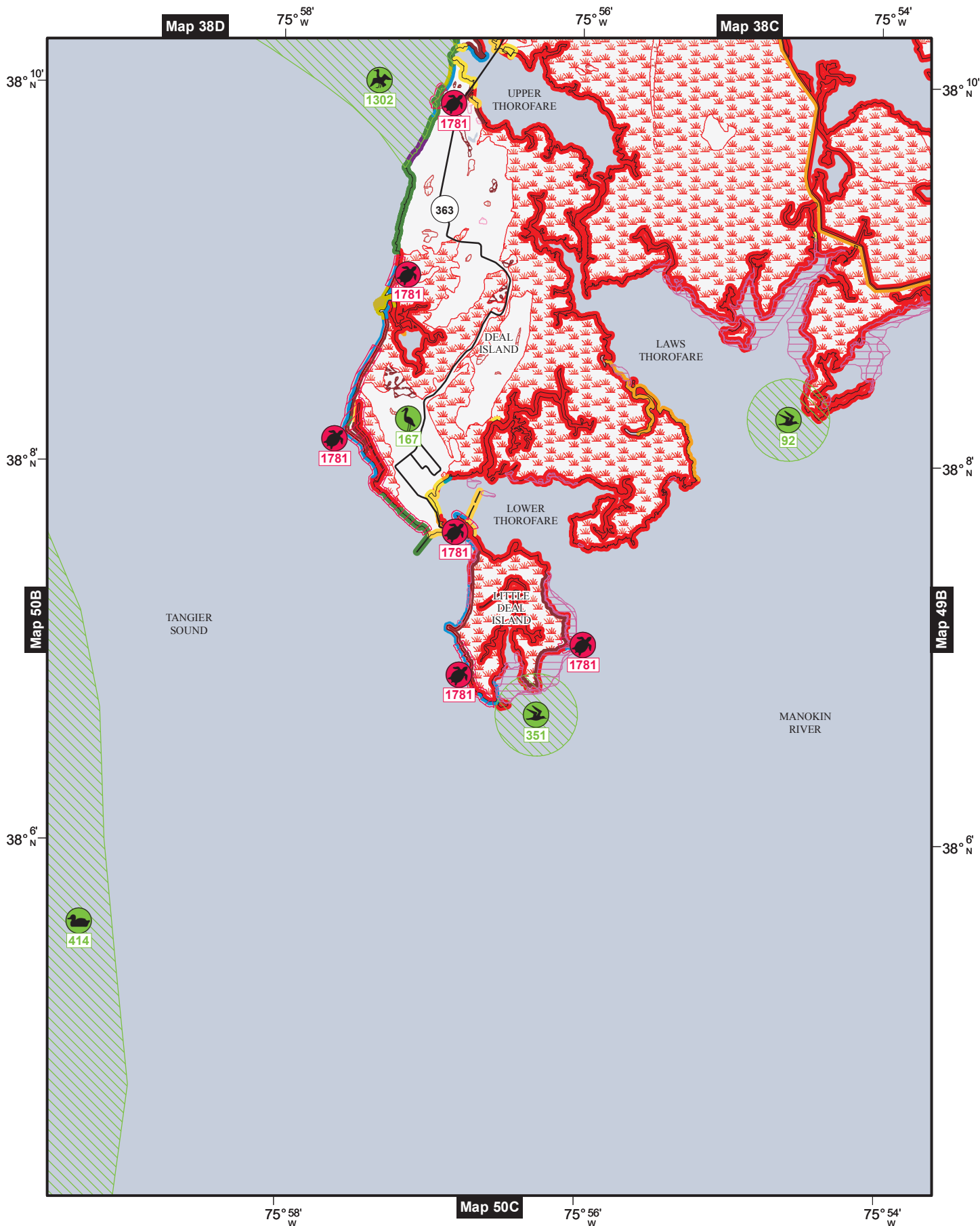
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	477,996.56	297.01	72%
10C	Swamps	338.62	0.21	< 1%
10D	Scrub and Shrub Wetlands	9,996.67	6.21	2%
9A	Sheltered Tidal Flats	6,559.80	4.08	1%
9B	Vegetated Low Banks	4,709.95	2.93	1%
8B	Sheltered, Solid Man-Made Structures	5,759.02	3.58	1%
8C	Sheltered Riprap	1,920.79	1.19	< 1%
7	Exposed Tidal Flats	120,721.03	75.01	18%
6B	Riprap	5,717.28	3.55	1%
5	Mixed Sand and Gravel Beaches	58.76	0.04	< 1%
4	Coarse Grained Sand Beaches	10,493.42	6.52	2%
3A	Fine to Medium Grained Sand Beaches	20,206.68	12.56	3%
1B	Exposed, Solid Man-Made Structures	638.63	0.40	< 1%
Total ESI Shoreline:		665,117.19	413.28	
Total Shoreline:		490,708.62	304.91	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



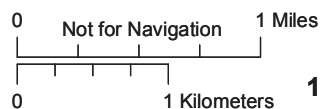


Map 50A

Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



1:50,000



Map 50A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		High												
SAV	Submerged aquatic veg	High Ecological Value		Low												

BIRDS




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
92	Gull/Tern	Forster's tern	Nesting			188 Pairs												May-Jul	-	-		
167	Wading	Great blue heron	Nesting			8 Nests												Feb-Jun	-	-		
351	Gull/Tern	Forster's tern	Nesting			3 Pairs												May-Jul	-	-		
414	Waterfowl	Brant	Wintering			10S												-	-	-		
	Waterfowl	Canvasback	Wintering			100S												-	-	-		
	Waterfowl	Common goldeneye	Wintering			100S												-	-	-		
	Waterfowl	Redhead	Wintering			10,000S												-	-	-		
	Waterfowl	Ruddy duck	Wintering			100S												-	-	-		
	Waterfowl	Scaup	Wintering			1,000S												-	-	-		
	Waterfowl	Tundra swan	Wintering			1,000S												-	-	-		
1302	Diving	Common loon	Wintering			100S												-	-	-		

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Nest	Hatch	Interst	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
1781	Turtle	Diamondback terrapin	Nesting		Possible Nest													May-Aug	-	-	Apr-Oct	Apr-Oct

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
					J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon	Wintering		100S												-	-	-	-
		D. crested cormorant	Migration		1,000S												-	Mar-May	Aug-Nov	-
		Grebes	Wintering		100S												-	-	-	-
		Red-throated loon	Wintering		100S												-	-	-	-
	Pelagic	Northern gannet	Wintering		100S												-	-	-	-
	Waterfowl	American black duck	Nesting		Moderate-High												Mar-Aug	-	-	Jul-Aug
		American black duck	Wintering		1,000S												-	-	-	-
		American coot	Wintering		10S												-	-	-	-


BIRDS (continued)

Subelement	Species	Mapping Qualifier	MDVA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	American wigeon	Wintering			100S												-	-	-	-
	Bufflehead	Wintering			1,000S												-	-	-	-
	Canada goose	Nesting			Moderate-High												Mar-Jun	-	-	Jul-Aug
	Canada goose	Wintering			100S												-	-	-	-
	Canvasback	Wintering			1,000S												-	-	-	-
	Common goldeneye	Wintering			10S												-	-	-	-
	Gadwall	Wintering			1,000S												-	-	-	-
	Green-winged teal	Wintering			1,000S												-	-	-	-
	Long-tailed duck	Wintering			100S												-	-	-	-
	Mallard	Wintering			1,000S												-	-	-	-
	Mergansers	Wintering			100S												-	-	-	-
	Northern pintail	Wintering			10S												-	-	-	-
	Northern shoveler	Wintering			Present												-	-	-	-
	Redhead	Wintering			1,000S												-	-	-	-
	Ring-necked duck	Wintering			10S												-	-	-	-
	Ruddy duck	Wintering			1,000S												-	-	-	-
	Scaup	Wintering			100S												-	-	-	-
	Scoters	Wintering			10,000S												-	-	-	-
	Snow goose	Wintering			1,000S												-	-	-	-
	Tundra swan	Wintering			100S												-	-	-	-
	Wood duck	Nesting			Moderate-High												Mar-Jun	-	-	Jul-Aug

FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Migration			-													-	-	-	Aug-Nov	Mar-May
	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	American shad	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Atlantic sturgeon	General Distribution			-													-	-	-	-	Jan-Dec
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution			E/E													-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-													-	-	-	-	Mar-Jun
	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-

REPTILES & AMPHIBIANS



Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle	General Distribution			Uncommon													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution			Common													-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution			Abundant													-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution			Common													-	-	-	Nov-Dec	Nov-Dec

Central Bay: Map 50A

INVERTEBRATES

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MARINE MAMMALS

	Subelement	Species	Mapping Qualifier	MDVA		Monthly Presence												Calving	Pupping	Molt	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				D
	Manatee	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-
	Whale	Humpback whale	General Distribution	E/E	E	Very Rare													-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS




Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
Gull/Tern	D. crested cormorant													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
Passerine	Saltmarsh sharp-tailed sparrow													May-Aug	-	-	-
	Seaside sparrow													May-Jul	-	-	-
Pelagic	Storm-petrels													-	-	-	-
Shorebird	Willet													May-Jul	-	-	-
Wading	Clapper rail													Apr-Sep	-	-	-

FISH



Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec

Central Bay: Map 50A


FISH (continued)

Subelement	Species	Mapping Qualifier	MD/VA	Monthly Presence												Eggs	Spawn	Larvae	Juveniles	Adults
				J	F	M	A	M	J	J	A	S	O	N	D					
 Estuarine Resident Fish	White perch																			Jan-Dec
	Silversides																Mar-Jul			Mar-Nov
 Marine Benthic	Anchovies																Apr-Sep			Jan-Dec
	Striped burrfish																			May-Oct
	Atlantic spadefish																			Jun-Sep
	Cownose ray																			May-Oct
 Marine Pelagic	Northern searobin																Jun-Jul			Apr-Dec
	Spotted hake																May-Jul			Jan-Dec
	Butterfish																			Mar-Nov
	Harvestfish																			May-Nov

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA	Monthly Presence												Eggs	Spawn	Larvae	Juveniles	Adults
				J	F	M	A	M	J	J	A	S	O	N	D					
 Bivalve	Eastern oyster																Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam																Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam																May-Dec*		Jan-Dec	Jan-Dec
 Crab	Blue crab																		Jan-Dec	Jan-Dec
	Horseshoe crab																		Jan-Dec	Jan-Dec

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA	Monthly Presence												Mating	Calving	Pupping	Molt
				J	F	M	A	M	J	J	A	S	O	N	D				
 Dolphin	Bottlenose dolphin															May-Aug	May-Aug		-
	Bottlenose dolphin																		-
	Harbor porpoise																		-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	3,286.30	5.13
10B	Freshwater Marshes	2.36	0.00
10C	Swamps	30.72	0.05
10D	Scrub and Shrub Wetlands	27.98	0.04
9A	Sheltered Tidal Flats	1.10	0.00
7	Exposed Tidal Flats	6.70	0.01

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	93,576.77	58.15	77%
10C	Swamps	274.38	0.17	< 1%
10D	Scrub and Shrub Wetlands	6,061.96	3.77	5%
9A	Sheltered Tidal Flats	3,959.79	2.46	3%
9B	Vegetated Low Banks	3,704.44	2.30	3%
8B	Sheltered, Solid Man-Made Structures	1,484.88	0.92	1%
8C	Sheltered Riprap	1,815.47	1.13	2%
7	Exposed Tidal Flats	947.31	0.59	1%
6B	Riprap	3,083.22	1.92	3%
5	Mixed Sand and Gravel Beaches	58.76	0.04	< 1%
4	Coarse Grained Sand Beaches	5,497.75	3.42	5%
1B	Exposed, Solid Man-Made Structures	335.14	0.21	< 1%

Total ESI Shoreline: 120,799.86 Total ESI Shoreline: 75.06
Total Shoreline: 100,746.71 Total Shoreline: 62.60

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 50B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
					J	F	M	A	M	J	J	A	S	O	N	D				
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral													-	-	-	-
SAV	Submerged aquatic veg	High Ecological Value		High													-	-	-	-
SAV	Submerged aquatic veg	High Ecological Value		Low													-	-	-	-




BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
50	Diving	Brown pelican	Nesting		1594 Pairs													May-Sep	-	-	-
	Diving	D. crested cormorant	Nesting		557 Pairs													May-Aug	-	-	-
	Gull/Tern	Common tern	Nesting		46 Pairs													May-Aug	-	-	-
	Gull/Tern	Forster's tern	Nesting		427 Pairs													May-Jul	-	-	-
	Gull/Tern	G. black-backed gull	Nesting		27 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting		300 Pairs													Apr-Jul	-	-	-
	Wading	Great egret	Nesting		8 Pairs													Apr-Aug	-	-	-
87	Gull/Tern	Herring gull	Nesting		1 Pair													Apr-Jul	-	-	-
155	Wading	Great blue heron	Nesting		4 Nests													Feb-Jun	-	-	-
	Wading	Great egret	Nesting		30 Nests													Apr-Aug	-	-	-
469	Waterfowl	American black duck	Nesting		High													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Canada goose	Nesting		Moderate-High													Mar-Jun	-	-	Jul-Aug
	Waterfowl	Mallard	Nesting		Moderate-High													Mar-Aug	-	-	Jul-Aug
494	Diving	Brown pelican	Nesting		17 Pairs													May-Sep	-	-	-
	Diving	D. crested cormorant	Nesting		12 Pairs													May-Aug	-	-	-
	Wading	Great blue heron	Nesting		4 Pairs													Feb-Jun	-	-	-
550	Raptor	Peregrine falcon	Nesting	-/T	-													Feb-Jun	-	Sep-Oct	-
1302	Diving	Common loon	Wintering		100S													-	-	-	-
1353	Diving	Brown pelican	Nesting		24 Pairs													May-Sep	-	-	-
	Diving	D. crested cormorant	Nesting		5 Pairs													May-Aug	-	-	-
	Gull/Tern	G. black-backed gull	Nesting		18 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting		36 Pairs													Apr-Jul	-	-	-


REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
1781	Turtle	Diamondback terrapin	Nesting		Possible Nest													May-Aug	-	-	Apr-Oct	Apr-Oct
1782	Turtle	Diamondback terrapin	Nesting		Probable Nest													May-Aug	-	-	Apr-Oct	Apr-Oct


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Common loon	Wintering			100S													-	-	-	-
	D. crested cormorant	Migration			1,000S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			100S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Northern gannet	Wintering			100S													-	-	-	-
Pelagic 	American black duck	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug
Waterfowl 	American black duck	Wintering			1,000S													-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-
	Brant	Wintering			10S													-	-	-	-
	Bufflehead	Wintering			1,000S													-	-	-	-
	Canada goose	Wintering			100S													-	-	-	-
	Canvasback	Wintering			100S													-	-	-	-
	Common goldeneye	Wintering			100S													-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-
	Green-winged teal	Wintering			10S													-	-	-	-
	Long-tailed duck	Wintering			100S													-	-	-	-
	Mallard	Wintering			1,000S													-	-	-	-
	Mergansers	Wintering			100S													-	-	-	-
	Northern pintail	Wintering			100S													-	-	-	-
	Redhead	Wintering			10,000S													-	-	-	-
	Ring-necked duck	Wintering			10S													-	-	-	-
	Ruddy duck	Wintering			100S													-	-	-	-
	Scaup	Wintering			1,000S													-	-	-	-
	Scoters	Wintering			10,000S													-	-	-	-
	Tundra swan	Wintering			1,000S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife	Migration			-													-	-	-	Aug-Nov	Mar-May
	American shad	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-													-	-	-	-	Mar-Jun

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Blue crab	Concentration Area			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS






Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	West Indian manatee	General Distribution	-/E	E	Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS




Subelement	Species	Mapping Qualifier	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican														-	-	-	-
	Brown pelican														-	-	-	-
	Brown pelican														-	-	-	-
	D. crested cormorant														-	-	-	-
	Gulls														-	-	-	-
	Terns														-	-	-	-
	Storm-petrels														-	-	-	-

FISH



Subelement	Species	Mapping Qualifier	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife														Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel														-	-	-	Jan-May	Jan-Dec
	Blueback herring														Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad														Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass														-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker														-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden														-	-	-	Jan-Dec	Jan-Dec
	Black drum														Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass														-	-	-	Apr-Nov	Apr-Nov
	Bluefish														-	-	-	May-Oct	May-Oct
	Northern puffer														-	-	-	Mar-Oct	Mar-Nov
	Red drum														-	-	-	-	May-Nov
	Spot														-	-	-	Nov-Apr	Apr-Dec

Central Bay: Map 50B

FISH (continued)

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Spotted seatrout													-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	May-Aug	Jan-Dec	Apr-Dec
	White perch													-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	Jan-Dec
	Striped burrfish													-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	Jun-Sep
	Cownose ray													-	-	May-Oct	May-Oct
	Northern searobin													Jun-Jul	-	-	Apr-Dec
	Spotted hake													May-Jul	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	May-Nov
														-	-	-	-

INVERTEBRATES

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Eastern oyster													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	4,046.85	6.32
10C	Swamps	3.55	0.01
7	Exposed Tidal Flats	26.67	0.04



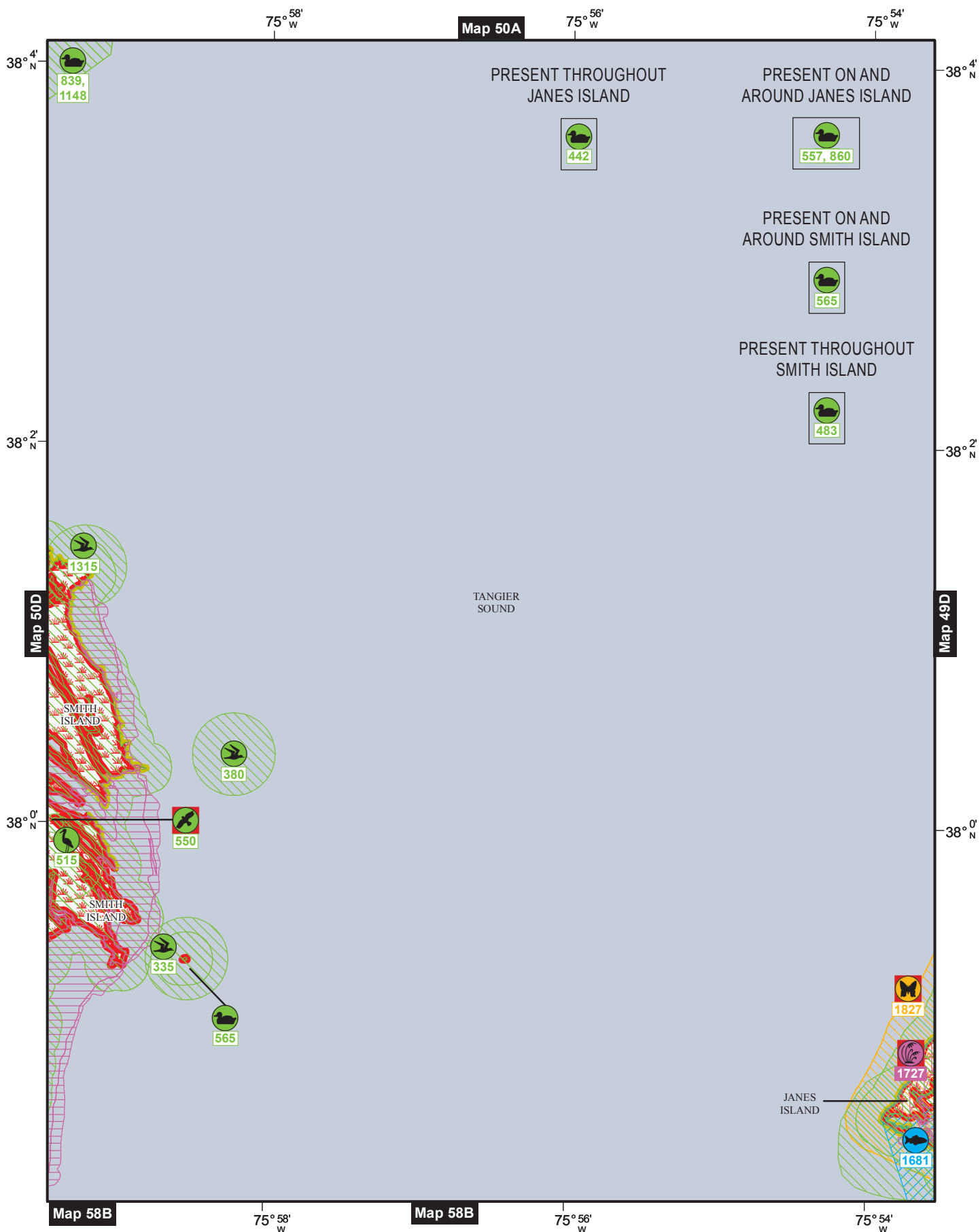
ESI SHORELINE HABITAT TYPES

	ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline	
	10A	Salt and Brackish Water Marshes	141,147.31	87.71	59%	
	10C	Swamps	64.23	0.04	< 1%	
	7	Exposed Tidal Flats	87,742.19	54.52	37%	
	4	Coarse Grained Sand Beaches	2,513.77	1.56	1%	
	3A	Fine to Medium Grained Sand Beaches	6,803.41	4.23	3%	
Total ESI Shoreline:			238,270.91	Total ESI Shoreline:	148.05	
			Total Shoreline:	141,523.47	Total Shoreline:	87.94

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

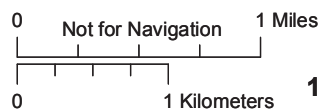




Map 50C
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



1:50,000



Map 50C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		High												
SAV	Submerged aquatic veg	High Ecological Value		Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
335	Gull/Tern	G. black-backed gull	Nesting		13 Pairs												
380	Gull/Tern	G. black-backed gull	Nesting		15 Pairs												
442	Waterfowl	American black duck	Nesting		Moderate												
	Waterfowl	Canada goose	Nesting		Moderate-High												
	Waterfowl	Mallard	Nesting		Moderate-High												
	Waterfowl	Wood duck	Nesting		Moderate-High												
483	Waterfowl	American black duck	Nesting		Very High												
	Waterfowl	Mallard	Nesting		Moderate-High												
515	Wading	BC night-heron	Nesting		12 Pairs												
	Wading	Glossy ibis	Nesting		1 Pair												
	Wading	Little blue heron	Nesting		1 Pair												
	Wading	YC night-heron	Nesting		2 Pairs												
550	Raptor	Peregrine falcon	Nesting	-JT	-												
557	Waterfowl	American black duck	Wintering		1,000S												
	Waterfowl	American coot	Wintering		10S												
	Waterfowl	American wigeon	Wintering		100S												
	Waterfowl	Gadwall	Wintering		1,000S												
	Waterfowl	Green-winged teal	Wintering		1,000S												
	Waterfowl	Mallard	Wintering		1,000S												
	Waterfowl	Northern pintail	Wintering		10S												
565	Waterfowl	Northern shoveler	Wintering		Present												
	Waterfowl	American black duck	Wintering		1,000S												
	Waterfowl	American wigeon	Wintering		100S												
	Waterfowl	Gadwall	Wintering		100S												
	Waterfowl	Green-winged teal	Wintering		100S												
	Waterfowl	Mallard	Wintering		100S												
	Waterfowl	Northern pintail	Wintering		100S												
839	Waterfowl	Northern pintail	Wintering		100S												
	Waterfowl	Canada goose	Wintering		100S												
860	Waterfowl	Canada goose	Wintering		100S												
	Waterfowl	Canvasback	Wintering		1,000S												

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Waterfowl	Redhead	Wintering			1,000S													-				-
	Waterfowl	Ruddy duck	Wintering			1,000S													-				-
	Waterfowl	Scaup	Wintering			100S													-				-
	Waterfowl	Snow goose	Wintering			1,000S													-				-
	Waterfowl	Tundra swan	Wintering			100S													-				-
1148	Waterfowl	Brant	Wintering			10S													-				-
	Waterfowl	Common goldeneye	Wintering			100S													-				-
	Waterfowl	Ruddy duck	Wintering			100S													-				-
1315	Gull/Tern	G. black-backed gull	Nesting			53 Pairs													Apr-Jun				-
	Gull/Tern	Herring gull	Nesting			26 Pairs													Apr-Jul				-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1681	Diadromous	Alewife	Nursery Area			-													-		Apr-Jun	May-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-		May-Jul	May-Oct	Feb-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-				-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1827	Insect	Federally threatened insect 1	Vulnerable Occurrence	E/T	T	-													Jun-Aug	Jun-Jul	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diving	Common loon	Wintering			100S													-				-
		D. crested cormorant	Migration			1,000S													-	Mar-May	Aug-Nov	-	-
		Grebes	Wintering			100S													-				-
		Red-throated loon	Wintering			100S													-				-
		Northern gannet	Wintering			100S													-				-
		Brant	Wintering			100S													-				-
		Bufflehead	Wintering			1,000S													-				-
		Canada goose	Wintering			1,000S													-				-
		Canvasback	Wintering			100S													-				-
		Common goldeneye	Wintering			10S													-				-
		Long-tailed duck	Wintering			100S													-				-
		Mergansers	Wintering			100S													-				-


BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Eggs	Larvae	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						
		Redhead	Wintering			10,000S												-	-	-	-	-	-
		Ring-necked duck	Wintering			10S												-	-	-	-	-	-
		Ruddy duck	Wintering			10S												-	-	-	-	-	-
		Scaup	Wintering			1,000S												-	-	-	-	-	-
		Scoters	Wintering			10,000S												-	-	-	-	-	-
		Tundra swan	Wintering			1,000S												-	-	-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Diadromous Alewife	Migration			-												-	-	-	Aug-Nov	Mar-May
	American shad	Migration			-												-	-	-	Aug-Nov	Mar-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-												-	-	-	-	Jan-Dec
	Blueback herring	Migration			-												-	-	-	Aug-Nov	Feb-Jun
	Hickory shad	Migration			-												-	-	-	Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution	E/E	E	-												-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-												-	-	-	-	Mar-Jun



REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct





INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Crab	Concentration Area			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct










MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Manatee	General Distribution	-/E	E	Rare												-	-	-	-
	Whale	General Distribution	E/E	E	Very Rare												-	-	-	-

BIRDS

Subelement	Species	Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diving													-	-	-	-	-
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-
	Seaside sparrow													May-Jul	-	-	-	-
	Willet													May-Jul	-	-	-	-
	Clapper rail													Apr-Sep	-	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous													Mar-May	Mar-May	Apr-Jun	Apr-May	Mar-May
	Alewife													-	-	-	Jan-May	Jan-Dec
	American eel													Apr-Jun	Apr-Jun	May-Jul	Jan-May	Feb-Jun
	Blueback herring													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Gizzard shad													-	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bivalve																
	Eastern oyster																
	Hard clam																
	Crab																
	Softshell clam																
	Blue crab																
	Horseshoe crab																

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin																
	Bottlenose dolphin																
	Harbor porpoise																

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES		
ESI Rank	Habitat Classification	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	0.65



ESI SHORELINE HABITAT TYPES		
ESI Rank	Shoreline Habitat Classification	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	70%
7	Exposed Tidal Flats	22%
6B	Riprap	< 1%
4	Coarse Grained Sand Beaches	7%

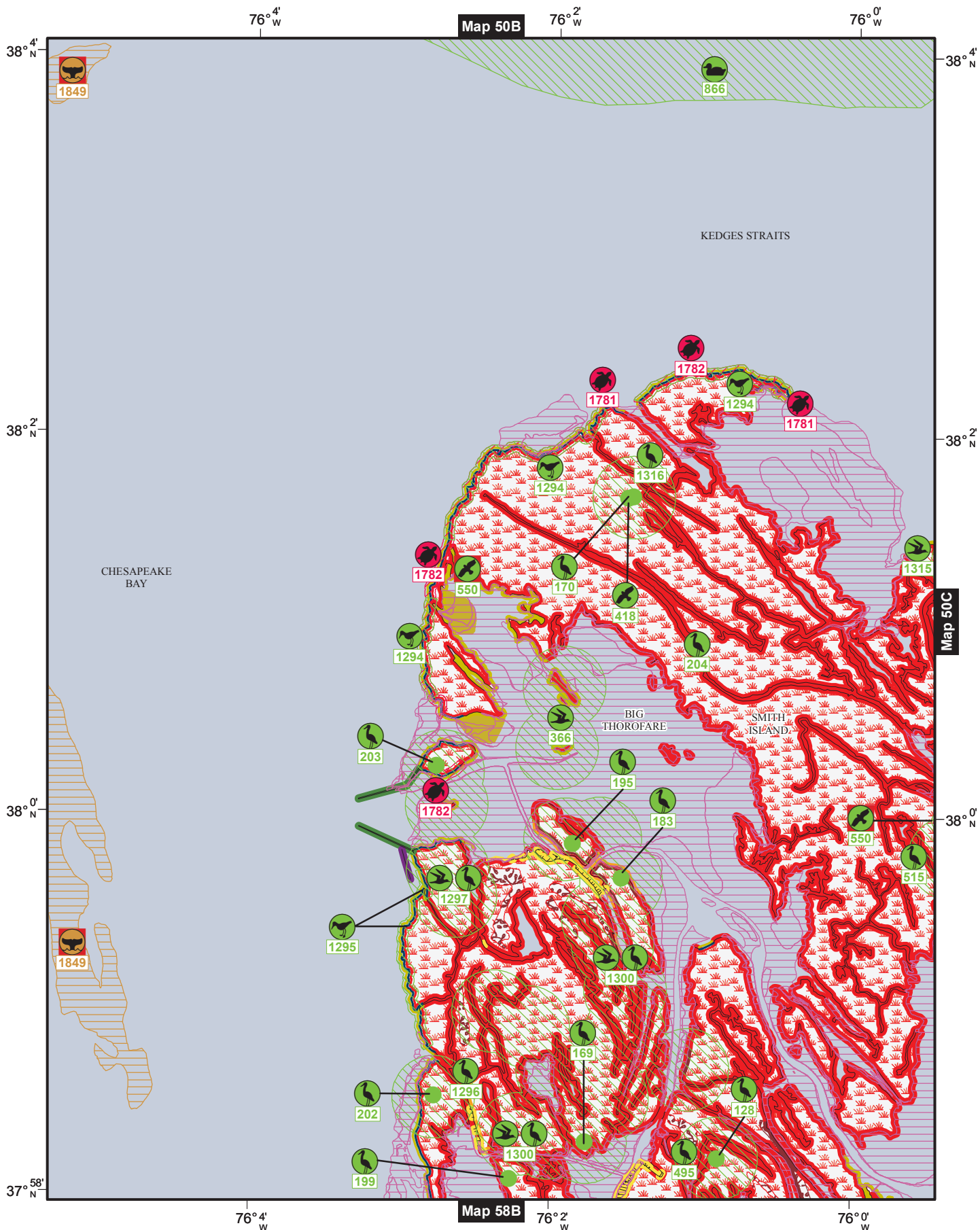


Total ESI Shoreline: 34,789.38
Total ESI Shoreline: 21.62
Total Shoreline: 24,417.38
Total Shoreline: 15.17

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

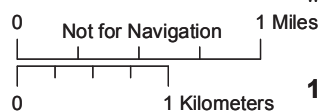




Map 50D Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



1:50,000



Map 50D
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		High												
SAV	Submerged aquatic veg	High Ecological Value		Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
128	Wading	Great blue heron	Nesting		3 Nests												
	Wading	Great egret	Nesting		18 Nests												
169	Wading	Great blue heron	Nesting		15 Nests												
170	Wading	Great blue heron	Nesting		15 Nests												
	Wading	Great egret	Nesting		45 Nests												
183	Wading	Great blue heron	Nesting		9 Nests												
195	Wading	Great blue heron	Nesting		48 Nests												
199	Wading	Great egret	Nesting		8 Nests												
202	Wading	Great blue heron	Nesting		1 Nest												
	Wading	Great egret	Nesting		5 Nests												
203	Wading	Great egret	Nesting		15 Nests												
204	Wading	Great egret	Nesting		140 Nests												
366	Gull/Tern	G. black-backed gull	Nesting		25 Pairs												
	Gull/Tern	Herring gull	Nesting		55 Pairs												
418	Raptor	Bald eagle	Nesting		Last Obs. 2004												
495	Wading	Great blue heron	Nesting		3 Pairs												
515	Wading	BC night-heron	Nesting		12 Pairs												
	Wading	Glossy ibis	Nesting		1 Pair												
	Wading	Little blue heron	Nesting		1 Pair												
	Wading	YC night-heron	Nesting		2 Pairs												
550	Raptor	Peregrine falcon	Nesting	-JT	-												
866	Waterfowl	Brant	Wintering		10S												
	Waterfowl	Canada goose	Wintering		100S												
	Waterfowl	Common goldeneye	Wintering		100S												
	Waterfowl	Ruddy duck	Wintering		100S												
1294	Shorebird	American oystercatcher	Nesting		26 Nests												
1295	Shorebird	American oystercatcher	Nesting		10 Nests												
1296	Wading	Great blue heron	Nesting		1 Pair												
1297	Gull/Tern	G. black-backed gull	Nesting		32 Pairs												
	Gull/Tern	Herring gull	Nesting		637 Pairs												

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Wading	BC night-heron	Nesting			15 Pairs												Apr-Aug	-	-	-
	Wading	Glossy ibis	Nesting			4 Pairs												Apr-Jul	-	-	-
	Wading	Great blue heron	Nesting			1 Pair												Feb-Jun	-	-	-
	Wading	Great egret	Nesting			2 Pairs												Apr-Aug	-	-	-
	Wading	Little blue heron	Nesting			8 Pairs												May-Jun	-	-	-
	Wading	Tricolored heron	Nesting			5 Pairs												Mar-Apr	-	-	-
	Wading	YC night-heron	Nesting			26 Pairs												Apr-Jul	-	-	-
1300	Gull/Tern	G. black-backed gull	Nesting			14 Pairs												Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting			148 Pairs												Apr-Jul	-	-	-
	Wading	BC night-heron	Nesting			34 Pairs												Apr-Aug	-	-	-
	Wading	Glossy ibis	Nesting			10 Pairs												Apr-Jul	-	-	-
	Wading	Great blue heron	Nesting			98 Pairs												Feb-Jun	-	-	-
	Wading	Great egret	Nesting			3 Pairs												Apr-Aug	-	-	-
	Wading	Little blue heron	Nesting			8 Pairs												May-Jun	-	-	-
	Wading	Snowy egret	Nesting			12 Pairs												Apr-Aug	-	-	-
	Wading	Tricolored heron	Nesting			10 Pairs												Mar-Apr	-	-	-
	Wading	YC night-heron	Nesting			17 Pairs												Apr-Jul	-	-	-
1315	Gull/Tern	G. black-backed gull	Nesting			53 Pairs												Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting			26 Pairs												Apr-Jul	-	-	-
1316	Wading	Great blue heron	Nesting			15 Pairs												Feb-Jun	-	-	-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Nest	Hatch	Interst	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1781	Turtle	Diamondback terrapin	Nesting			Possible Nest												May-Aug	-	-	Apr-Oct	Apr-Oct
1782	Turtle	Diamondback terrapin	Nesting			Probable Nest												May-Aug	-	-	Apr-Oct	Apr-Oct

MARINE MAMMALS



Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Mating	Calving	Pupping	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
1849	Whale	Humpback whale	General Distribution	E/E	E	Very Rare												-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Diving	Common loon	Wintering			100S												-	-	-	-
		Common loon	Wintering			100S												-	-	-	-
		D. crested cormorant	Migration			1,000S												-	Mar-May	Aug-Nov	-
		D. crested cormorant	Wintering			1,000S												-	Mar-May	Aug-Nov	-
		Grebes	Wintering			100S												-	-	-	-
		Grebes	Wintering			100S												-	-	-	-
		Red-throated loon	Wintering			100S												-	-	-	-


BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	J	F	M	A	M	J	J	A	S	O	N	D				
	Pelagic	Northern gannet	Wintering															-	-	-	-
	Waterfowl	American black duck	Nesting															Mar-Aug	-	-	Jul-Aug
		American black duck	Wintering															-	-	-	-
		American wigeon	Wintering															-	-	-	-
		Brant	Wintering															-	-	-	-
		Bufflehead	Wintering															-	-	-	-
		Canada goose	Wintering															-	-	-	-
		Canvasback	Wintering															-	-	-	-
		Common goldeneye	Wintering															-	-	-	-
		Gadwall	Wintering															-	-	-	-
		Green-winged teal	Wintering															-	-	-	-
		Long-tailed duck	Wintering															-	-	-	-
		Mallard	Nesting															Mar-Aug	-	-	Jul-Aug
		Mallard	Wintering															-	-	-	-
		Mergansers	Wintering															-	-	-	-
		Northern pintail	Wintering															-	-	-	-
		Redhead	Wintering															-	-	-	-
		Ring-necked duck	Wintering															-	-	-	-
		Ruddy duck	Wintering															-	-	-	-
		Scaup	Wintering															-	-	-	-
		Sooters	Wintering															-	-	-	-
		Tundra swan	Wintering															-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Alewife															-	-	-	Aug-Nov	Mar-May
		American shad															-	-	-	Aug-Nov	Mar-Jun
		Atlantic sturgeon															-	-	-	-	Jan-Dec
		Blueback herring															-	-	-	Aug-Nov	Feb-Jun
		Hickory shad															-	-	-	Jun-Oct	Feb-Jun
		Shortnose sturgeon															-	-	-	Jan-Dec	Jan-Dec
		Striped bass															-	-	-	-	Mar-Jun

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle	K. ridley sea turtle	E/E	E													-	-	-	Nov-Dec	-
		K. ridley sea turtle	E/E	E													-	-	-	Apr-Oct	-
		Loggerhead sea turtle	T/T	T													-	-	-	Nov-Dec	Nov-Dec
		Loggerhead sea turtle	T/T	T													-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES


Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
			S	F		J	F	M	A	M	J	J	A	S	O	N	D						
Crab	Blue crab	Concentration Area			Highly Abundant-Summ														-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS

	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS



Subelement	Species	Monthly Presence																			Nest	Mig.(S)	Mig.(F)	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		-	J	F	M	A	M	J	J	A	S	O	N	D				
Diadromous	Alewife																	Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel																	-	-	-	Jan-May	Jan-Dec
	Blueback herring																	Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad																	Mar-Jun	-	-	-	Jan-Dec
	Striped bass																	-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker																	-	-	Dec-Apr	Jan-Dec	May-Nov
Estuarine Nursery	Atlantic menhaden																	Apr-Jun	-	-	Jan-Dec	Jan-Dec
	Black drum																	-	-	-	Apr-Dec	Apr-Dec
	Black sea bass																	-	-	-	Apr-Nov	Apr-Nov
	Bluefish																	-	-	-	May-Oct	May-Oct
	Northern puffer																	-	-	-	Mar-Oct	Mar-Nov
	Red drum																	-	-	-	-	May-Nov
	Spot																	-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout																	-	-	-	Aug-Dec	Apr-Dec
	Summer flounder																	-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish																	-	-	May-Aug	Jan-Dec	Apr-Dec
	White perch																	-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident Fish	Silversides																	Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies																	Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish																	-	-	-	May-Oct	May-Oct

Central Bay: Map 50D


FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Marine Benthic																	
	Atlantic spadefish																	
	Cownose ray													Jun-Jul	-	-	May-Oct	Jun-Sep
	Marine Pelagic																	
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve																	
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Crab													May-Dec*	-	-	Jan-Dec	Jan-Dec
	Softshell clam													-	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	5,093.15	7.96
10D	Scrub and Shrub Wetlands	90.14	0.14
7	Exposed Tidal Flats	55.15	0.09



ESI SHORELINE HABITAT TYPES

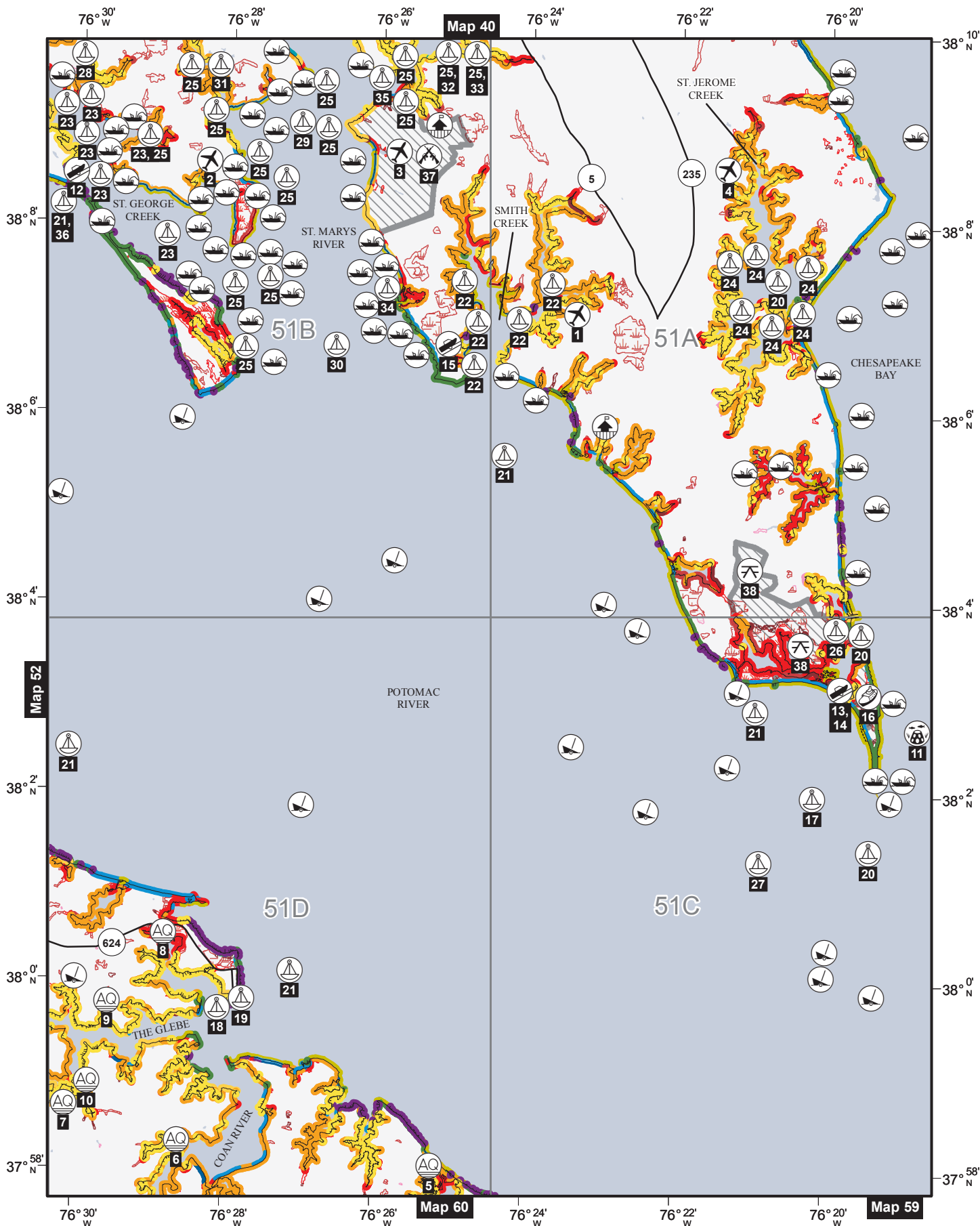
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	218,855.11	135.99	81%
10D	Scrub and Shrub Wetlands	3,934.71	2.44	1%
9A	Sheltered Tidal Flats	2,600.01	1.62	1%
9B	Vegetated Low Banks	1,005.51	0.62	< 1%
8B	Sheltered, Solid Man-Made Structures	4,274.13	2.66	2%
8C	Sheltered Riprap	105.32	0.07	< 1%
7	Exposed Tidal Flats	24,211.61	15.04	9%
6B	Riprap	2,563.88	1.59	1%
3A	Fine to Medium Grained Sand Beaches	13,403.27	8.33	5%
1B	Exposed, Solid Man-Made Structures	303.49	0.19	< 1%

Total ESI Shoreline: 271,257.04 Total ESI Shoreline: 168.55
 Total Shoreline: 224,021.06 Total Shoreline: 139.20

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 51
Central Bay

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)					Contact		Phone
Map ID	Type	Name					
1	AIRPORT	BONHAM					
2	AIRPORT	CHERRY FIELD					
3	AIRPORT	WEBSTER NOLF					
4	AIRPORT	WINGFIELD					
5	AQUACULTURE	OYSTER NON-COMM BAKER RF#01-2210			CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
6	AQUACULTURE	OYSTER NON-COMM JEWELL, LLOYD M., JR. RF#00-0008			CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
7	AQUACULTURE	OYSTER NON-COMM MCKENNEY RF#00-1951			CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
8	AQUACULTURE	OYSTER NON-COMM SZENAS RF#SZENAS			CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
9	AQUACULTURE	OYSTER NON-COMM TORBECK, KATHERINE M. RF#00-0095			CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
10	AQUACULTURE	OYSTER NON-COMM TYBORSKI, ROBERT M. RF#98-1712			CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
11	ARTIFICIAL REEF	POINT LOOKOUT					
12	BOAT RAMP	PINEY POINT RECREATION AREA			ST. MARY'S COUNTY - DEPT. OF REC. AND PARKS		
13	BOAT RAMP	POINT LOOKOUT STATE PARK - BOAT RAMPS			MARYLAND DNR - PARK SERVICE		
14	BOAT RAMP	POINT LOOKOUT STATE PARK - CAMP STORE/BOAT RENTAL			MARYLAND DNR - PARK SERVICE		
15	BOAT RAMP	ST. INIGOE LANDING			ST. MARY'S COUNTY - DEPT. OF REC. AND PARKS		
16	FERRY	POINT LOOKOUT STATE PARK FERRY					
17	REPEATED MEASUREMENT SITE	DB - MOORED BUOY, POTOMAC, MD			NATIONAL COASTAL DATA DEVELOPMENT CENTER		866-732-2382
18	REPEATED MEASUREMENT SITE	DB - NOS, 8635750 - LEWISSETTA, VA			NATIONAL COASTAL DATA DEVELOPMENT CENTER		866-732-2382
19	REPEATED MEASUREMENT SITE	NWLN - LEWISSETTA, POTOMAC RIVER			NATIONAL WATER LEVEL PROGRAM		301-713-2815
20	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, CHESAPEAKE BAY			MARYLAND DEPARTMENT OF THE ENVIRONMENT		410-537-3608
21	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, POTOMAC RIVER			MARYLAND DEPARTMENT OF THE ENVIRONMENT		410-537-3608
22	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, SMITH CREEK			MARYLAND DEPARTMENT OF THE ENVIRONMENT		410-537-3608
23	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, ST GEORGES CREEK			MARYLAND DEPARTMENT OF THE ENVIRONMENT		410-537-3608
24	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, ST JEROME CREEK			MARYLAND DEPARTMENT OF THE ENVIRONMENT		410-537-3608
25	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, ST MARYS RIVER			MARYLAND DEPARTMENT OF THE ENVIRONMENT		410-537-3608
26	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, TANNER CREEK			MARYLAND DEPARTMENT OF THE ENVIRONMENT		410-537-3608
27	REPEATED MEASUREMENT SITE	WQ - STATION LE2.3			CHESAPEAKE BAY PROGRAM		800-968-7229
28	REPEATED MEASUREMENT SITE	WQ - STATION SMNT14			CHESAPEAKE BAY PROGRAM		800-968-7229
29	REPEATED MEASUREMENT SITE	WQ - STATION SMT06			CHESAPEAKE BAY PROGRAM		800-968-7229
30	REPEATED MEASUREMENT SITE	WQ - STATION SMT07			CHESAPEAKE BAY PROGRAM		800-968-7229
31	REPEATED MEASUREMENT SITE	WQ - STATION SMT08			CHESAPEAKE BAY PROGRAM		800-968-7229
32	REPEATED MEASUREMENT SITE	WQ - STATION SMT10			CHESAPEAKE BAY PROGRAM		800-968-7229
33	REPEATED MEASUREMENT SITE	WQ - STATION SMT10B			CHESAPEAKE BAY PROGRAM		800-968-7229
34	REPEATED MEASUREMENT SITE	WQ - STATION SMT11			CHESAPEAKE BAY PROGRAM		800-968-7229
35	REPEATED MEASUREMENT SITE	WQ - STATION SMT12			CHESAPEAKE BAY PROGRAM		800-968-7229
36	REPEATED MEASUREMENT SITE	WQ - STATION SMT13			CHESAPEAKE BAY PROGRAM		800-968-7229

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
37	MILITARY	WEBSTER FLD		
38	PARK	POINT LOOKOUT SP	MARYLAND PARK SERVICE	
ALSO PRESENT IN MAPPED AREA (POINTS)				
Type	Name	Contact	Phone	
COAST GUARD	ANT POTOMAC		301-872-4036	
COAST GUARD	STA ST. INIGOES		301-872-4344	
ALSO PRESENT IN MAPPED AREA (POLYGONS)				
Type	Name	Contact	Phone	
ESSENTIAL HABITAT	RARE VULNERABLE SPECIES			
STATE PROTECTED AREA	POINT LOOKOUT SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367	
STATE PROTECTED AREA	ST INIGOES SF	MARYLAND FOREST SERVICE		

JURISDICTIONS

COUNTY: NORTHUMBERLAND COUNTY, ST. MARY'S COUNTY
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT

FEMA: REGION I
EPA: REGION 3

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	781.16	1.22
10B	Freshwater Marshes	22.78	0.04
10C	Swamps	965.22	1.51
10D	Scrub and Shrub Wetlands	71.77	0.11
7	Exposed Tidal Flats	33.71	0.05



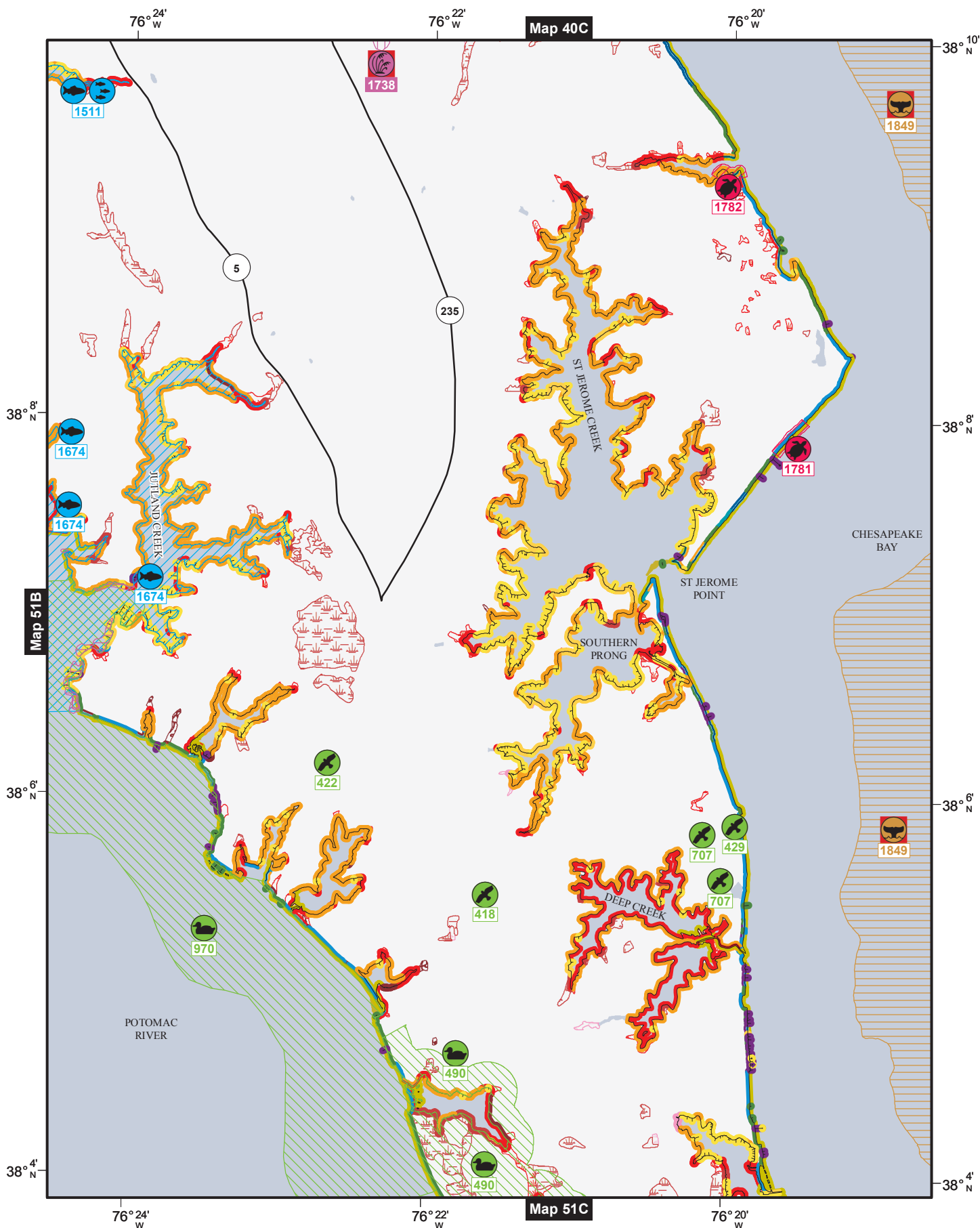
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	110,019.23	68.36	21%
10B	Freshwater Marshes	587.61	0.37	< 1%
10C	Swamps	10,633.09	6.61	2%
10D	Scrub and Shrub Wetlands	5,542.20	3.44	1%
9A	Sheltered Tidal Flats	609.04	0.38	< 1%
9B	Vegetated Low Banks	157,824.61	98.07	30%
8B	Sheltered, Solid Man-Made Structures	46,861.99	29.12	9%
8C	Sheltered Riprap	32,799.68	20.38	6%
7	Exposed Tidal Flats	71,755.27	44.59	14%
6B	Riprap	35,129.25	21.83	7%
5	Mixed Sand and Gravel Beaches	3,248.49	2.02	1%
4	Coarse Grained Sand Beaches	41,599.82	25.85	8%
3A	Fine to Medium Grained Sand Beaches	83.86	0.05	< 1%
3B	Scarps and Steep Slopes (Sand)	2,246.20	1.40	< 1%
1B	Exposed, Solid Man-Made Structures	11,813.99	7.34	2%
Total ESI Shoreline:		530,754.34	329.80	
Total Shoreline:		390,812.69	242.84	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 51A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
418	Raptor	Bald eagle	Nesting		Last Obs. 2004												
422	Raptor	Bald eagle	Nesting		Last Obs. 2003												
429	Raptor	Bald eagle	Nesting		Last Obs. 2006												
490	Waterfowl	American black duck	Nesting		Low												
707	Raptor	Bald eagle	Roosting		-												
970	Waterfowl	Canada goose	Wintering		1,000S												
	Waterfowl	Redhead	Wintering		100S												
	Waterfowl	Ring-necked duck	Wintering		100S												
	Waterfowl	Ruddy duck	Wintering		1,000S												
	Waterfowl	Scaup	Wintering		100S												

FISH

Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
1511	Diadromous	Alewife	Nursery Area		Moderate Run												
	Diadromous	Blueback herring	Nursery Area		Moderate Run												
	Estuarine Nursery	White perch	Spawning Area		-												
1674	Diadromous	Alewife	Nursery Area		Moderate Run												
	Diadromous	Blueback herring	Nursery Area		Moderate Run												

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
1738	Plant	Endangered plant	Vulnerable Occurrence	E/-	3 Species Present												

REPTILES & AMPHIBIANS




Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
1781	Turtle	Diamondback terrapin	Nesting		Possible Nest												
1782	Turtle	Diamondback terrapin	Nesting		Probable Nest												

MARINE MAMMALS








Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
				S	F	Concentration		J	F	M	A	M	J	J	A	S	O					N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
1849	Whale	Humpback whale	General Distribution	E/E	E	Very Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)




BIRDS

Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			Present													-	-	-	-
		Common loon			100S													-	-	-	-
		D. crested cormorant			1,000S													-	Mar-May	Aug-Nov	-
		Grebes			100S													-	-	-	-
		Grebes			100S													-	-	-	-
		Red-throated loon			Present													-	-	-	-
		Red-throated loon			100S													-	-	-	-
		Red-throated loon			100S													-	-	-	-
	Pelagic	Northern gannet			Present													-	-	-	-
		Northern gannet			Present													-	-	-	-
	Waterfowl	American black duck			1,000S													-	-	-	-
		American black duck			10S													-	-	-	-
		American coot			10S													-	-	-	-
		American coot			100S													-	-	-	-
		American wigeon			10S													-	-	-	-
		American wigeon			1,000S													-	-	-	-
		Bufflehead			Moderate-High													-	-	-	-
		Canada goose			10,000S													-	Mar-Jun	-	Jul-Aug
		Canada goose			1,000S													-	-	-	-
		Canvasback			100S													-	-	-	-
		Common goldeneye			10S													-	-	-	-
		Gadwall			100S													-	-	-	-
		Green-winged teal			100S													-	-	-	-
		Long-tailed duck			100S													-	-	-	-
		Mallard			Moderate-High													-	Mar-Aug	-	Jul-Aug
		Mallard			100S													-	-	-	-
		Mallard			1,000S													-	-	-	-
		Mergansers			100S													-	-	-	-
		Northern pintail			10S													-	-	-	-
		Northern pintail			100S													-	-	-	-
		Redhead			10S													-	-	-	-
		Ring-necked duck			10S													-	-	-	-
		Ruddy duck			10,000S													-	-	-	-
		Scaup			1,000S													-	-	-	-
		Scoters			100S													-	-	-	-
		Scoters			10,000S													-	-	-	-
		Snow goose			Present													-	-	-	-
		Tundra swan			100S													-	-	-	-
		Wood duck			Moderate-High													-	Mar-Jun	-	Jul-Aug
		Wood duck			Moderate-High													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diadromous	Alewife			Moderate Run													-	-	Aug-Nov	Mar-May
		Alewife																-	-	Aug-Nov	Mar-May
		American shad			-													-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		General Distribution			Strong Run													-	-	Aug-Nov	Mar-May
		Atlantic sturgeon																-	-	Aug-Nov	Mar-May
		Blueback herring			-/E E													-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
	Blueback herring	Migration			Moderate Run													-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
	Hickory shad	Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
	Shortnose sturgeon	General Distribution			Moderate Run													-	-	Aug-Nov	Mar-May
		General Distribution																-	-	Aug-Nov	Mar-May
		General Distribution																-	-	Aug-Nov	Mar-May
		General Distribution																-	-	Aug-Nov	Mar-May
		General Distribution																-	-	Aug-Nov	Mar-May
		General Distribution																-	-	Aug-Nov	Mar-May
		General Distribution																-	-	Aug-Nov	Mar-May
		General Distribution																-	-	Aug-Nov	Mar-May
		General Distribution																-	-	Aug-Nov	Mar-May
		General Distribution																-	-	Aug-Nov	Mar-May
	Shortnose sturgeon	Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
	Striped bass	Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
		Migration																-	-	Aug-Nov	Mar-May
	Striped bass	Nursery Area																-	-	Aug-Nov	Mar-May
		Nursery Area																-	-	Aug-Nov	Mar-May
		Nursery Area																-	-	Aug-Nov	Mar-May
		Nursery Area																-	-	Aug-Nov	Mar-May
		Nursery Area																-	-	Aug-Nov	Mar-May
		Nursery Area																-	-	Aug-Nov	Mar-May
		Nursery Area																-	-	Aug-Nov	Mar-May
		Nursery Area																-	-	Aug-Nov	Mar-May
		Nursery Area																-	-	Aug-Nov	Mar-May
		Nursery Area																-	-	Aug-Nov	Mar-May










REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Hatch	Nest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Turtle	K. ridley sea turtle			Uncommon													-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution			Common													-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
	Loggerhead sea turtle	General Distribution			Common													-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
	Loggerhead sea turtle	General Distribution			Abundant													-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-
		General Distribution																-	-	Nov-Dec	-


INVERTEBRATES

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence
------------	---------	-------------------	------	--	---------------	------------------



FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	Alewife													-	-	-	Jan-May	Jan-Dec
	American eel													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jan-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

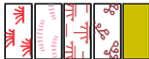
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	164.30	0.26
10B	Freshwater Marshes	9.67	0.02
10C	Swamps	341.23	0.53
10D	Scrub and Shrub Wetlands	11.54	0.02
7	Exposed Tidal Flats	23.79	0.04



ESI SHORELINE HABITAT TYPES

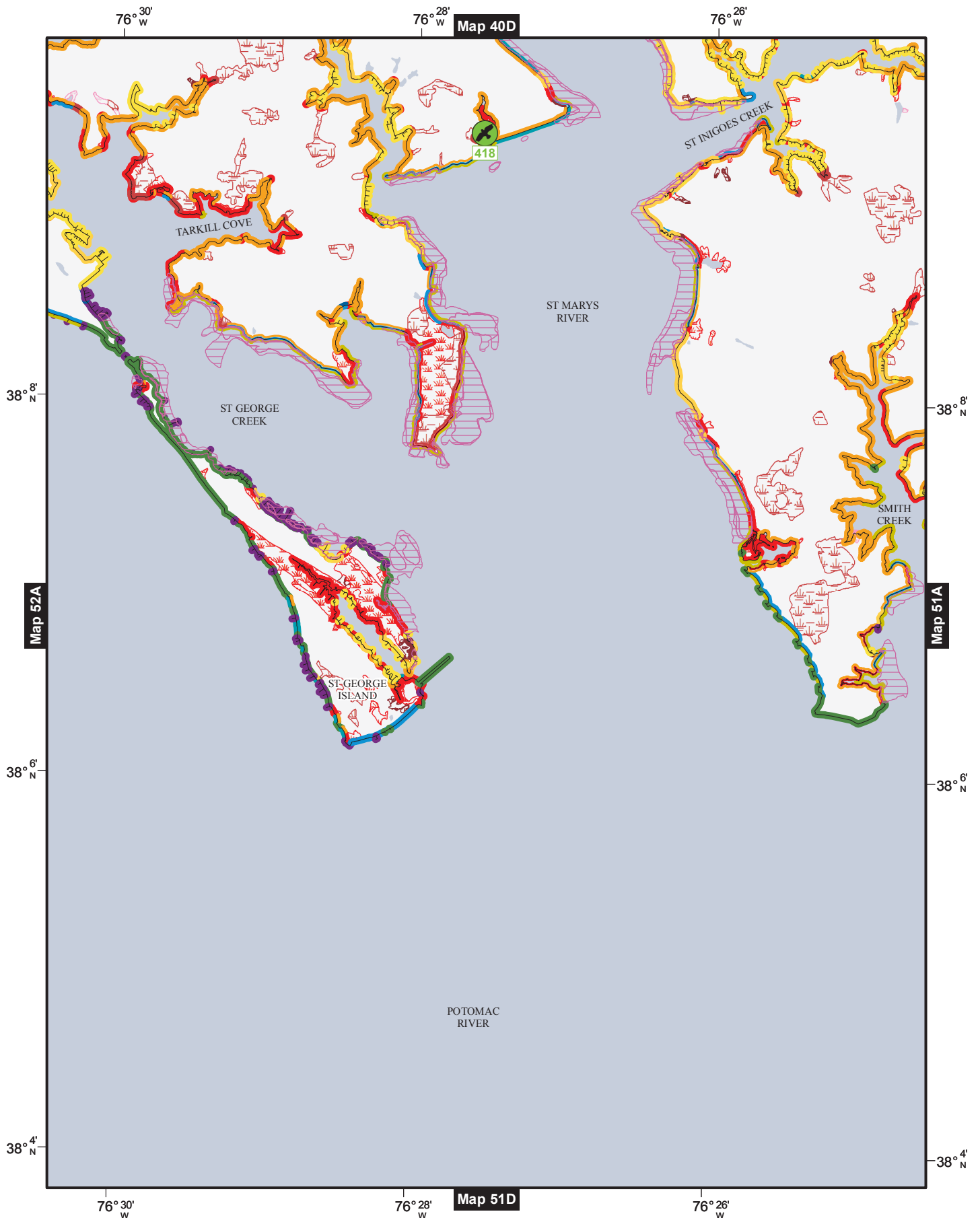
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	41,614.53	25.86	21%
10B	Freshwater Marshes	449.71	0.28	< 1%
10C	Swamps	4,535.74	2.82	2%
10D	Scrub and Shrub Wetlands	2,372.94	1.47	1%
9A	Sheltered Tidal Flats	422.63	0.26	< 1%
9B	Vegetated Low Banks	64,508.09	40.08	32%
8B	Sheltered, Solid Man-Made Structures	17,445.83	10.84	9%
8C	Sheltered Riprap	12,345.03	7.67	6%
7	Exposed Tidal Flats	30,788.27	19.13	15%
6B	Riprap	8,629.89	5.36	4%
5	Mixed Sand and Gravel Beaches	963.10	0.60	< 1%
4	Coarse Grained Sand Beaches	15,123.37	9.40	7%
3B	Scarps and Steep Slopes (Sand)	784.79	0.49	< 1%
1B	Exposed, Solid Man-Made Structures	2,629.45	1.63	1%

Total ESI Shoreline: 202,613.35 Total ESI Shoreline: 125.90
Total Shoreline: 143,469.25 Total Shoreline: 89.15

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

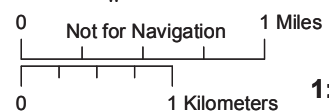




Map 51B
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



1:50,000



Map 51B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence											
							J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value				Ephemeral												
	Submerged aquatic veg	High Ecological Value				High												
	Submerged aquatic veg	High Ecological Value				Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence											
								J	F	M	A	M	J	J	A	S	O	N	D
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													

Feb-Apr

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)



BIRDS

Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence											
							J	F	M	A	M	J	J	A	S	O	N	D
Diving	Common loon	Wintering				10S												
	Common loon	Wintering				Present												
	D. crested cormorant	Wintering				1,000S												
	Grebes	Wintering				10S												
	Grebes	Wintering				100S												
	Red-throated loon	Wintering				Present												
Pelagic	Red-throated loon	Wintering				10S												
	Northern gannet	Wintering				100S												
	Northern gannet	Wintering				Present												
	American black duck	Wintering				10S												
Waterfowl	American coot	Wintering				100S												
	American wigeon	Wintering				10S												
	Bufflehead	Wintering				1,000S												
	Canada goose	Wintering				1,000S												
	Canvasback	Wintering				1,000S												
	Common goldeneye	Wintering				100S												
	Gadwall	Wintering				10S												
	Long-tailed duck	Wintering				100S												
	Mallard	Wintering				100S												
	Mergansers	Wintering				100S												
	Northern pintail	Wintering				10S												
	Redhead	Wintering				100S												
	Ring-necked duck	Wintering				100S												


BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
		Ruddy duck	Wintering			1,000S													-	-	-	
		Scaup	Wintering			100S													-	-	-	
		Scoters	Wintering			100S													-	-	-	
		Scoters	Wintering			1,000S													-	-	-	
		Tundra swan	Wintering			100S													-	-	-	

FISH

	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration																	
							J	F	M	A	M	J	J	A	S	O	N						D
	Diadromous	Alewife	Migration			Moderate Run											-	-	-	Aug-Nov	Mar-May		
		Alewife	Nursery Area			Moderate Run											-	-	Apr-Jun	Apr-Oct	Mar-May		
		American shad	Migration			Strong Run											-	-	-	Aug-Nov	Mar-Jun		
		Atlantic sturgeon	General Distribution	-/E	E	-											-	-	-	-	Jan-Dec		
		Blueback herring	Migration			Moderate Run											-	-	-	Aug-Nov	Feb-Jun		
		Blueback herring	Nursery Area			Moderate Run											-	-	May-Jul	May-Oct	Feb-Jun		
		Hickory shad	Migration			Moderate Run											-	-	-	Jun-Oct	Feb-Jun		
		Shortnose sturgeon	General Distribution	E/E	E	-											-	-	-	Jan-Dec	Jan-Dec		
		Shortnose sturgeon	Migration	E/E	E	-											-	-	-	-	Mar-Jun		
		Striped bass	Nursery Area			-											-	-	Apr-Jun	Jan-Dec	-		
	Estuarine Nursery	White perch	Spawning Area			-										Mar-May	Mar-May	Apr-Jun	-	Mar-May			

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct







MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Manatee	West Indian manatee	General Distribution	-/E	E	Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													</



BIRDS

Subelement	Species	Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Mar-May	Mar-May	Apr-Jun	Jan-May	Mar-May
	American eel													-	-	-	Jan-Dec	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec

Central Bay: Map 51B

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
	Dolphin	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-
	Bottlenose dolphin																

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	290.85	0.45
10B	Freshwater Marshes	5.85	0.01
10C	Swamps	372.41	0.58
10D	Scrub and Shrub Wetlands	18.35	0.03
7	Exposed Tidal Flats	4.70	0.01

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	34,762.70	21.60	23%
10B	Freshwater Marshes	137.91	0.09	< 1%
10C	Swamps	3,373.26	2.10	2%
10D	Scrub and Shrub Wetlands	1,243.99	0.77	1%
9A	Sheltered Tidal Flats	34.41	0.02	< 1%
9B	Vegetated Low Banks	40,264.89	25.02	27%
8B	Sheltered, Solid Man-Made Structures	10,344.69	6.43	7%
8C	Sheltered Riprap	9,457.89	5.88	6%
7	Exposed Tidal Flats	19,889.25	12.36	13%
6B	Riprap	11,490.23	7.14	8%
5	Mixed Sand and Gravel Beaches	2,285.39	1.42	2%
4	Coarse Grained Sand Beaches	12,414.04	7.71	8%
3B	Scarps and Steep Slopes (Sand)	212.08	0.13	< 1%
1B	Exposed, Solid Man-Made Structures	3,569.93	2.22	2%

Total ESI Shoreline: 149,480.67 Total ESI Shoreline: 92.88
Total Shoreline: 103,583.47 Total Shoreline: 64.36

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 51C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
44	Wading	Great blue heron	Nesting				62 Pairs													Feb-Jun	-	-	-
185	Wading	Great blue heron	Nesting				56 Nests													Feb-Jun	-	-	-
418	Raptor	Bald eagle	Nesting				Last Obs. 2004													Feb-Apr	-	-	-
452	Waterfowl	Canada goose	Nesting				Moderate-High													Mar-Jun	-	-	Jul-Aug
	Waterfowl	Mallard	Nesting				Moderate-High													Mar-Aug	-	-	Jul-Aug
463	Waterfowl	American black duck	Nesting				Low													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Canada goose	Nesting				Moderate-High													Mar-Jun	-	-	Jul-Aug
	Waterfowl	Mallard	Nesting				Moderate-High													Mar-Aug	-	-	Jul-Aug
484	Waterfowl	Wood duck	Nesting				Moderate-High													Mar-Jun	-	-	Jul-Aug
490	Waterfowl	American black duck	Nesting				Moderate-High													Mar-Aug	-	-	Jul-Aug
536	Waterfowl	Bufflehead	Wintering				Low																-
	Waterfowl	Canada goose	Wintering				1,000S																-
	Waterfowl	Canvasback	Wintering				1,000S																-
	Waterfowl	Common goldeneye	Wintering				100S																-
	Waterfowl	Mergansers	Wintering				100S																-
	Waterfowl	Redhead	Wintering				100S																-
	Waterfowl	Ring-necked duck	Wintering				100S																-
	Waterfowl	Ruddy duck	Wintering				1,000S																-
	Waterfowl	Scaup	Wintering				100S																-
	Waterfowl	Tundra swan	Wintering				100S																-
562	Waterfowl	American black duck	Wintering				1,000S																-
	Waterfowl	American coot	Wintering				10S																-
	Waterfowl	Green-winged teal	Wintering				100S																-
	Waterfowl	Mallard	Wintering				1,000S																-
	Waterfowl	Northern pintail	Wintering				100S																-
621	Waterfowl	American black duck	Wintering				10S																-
	Waterfowl	American coot	Wintering				100S																-
	Waterfowl	Mallard	Wintering				100S																-
	Waterfowl	Northern pintail	Wintering				10S																-
652	Waterfowl	American wigeon	Wintering				10S																-
	Waterfowl	Gadwall	Wintering				10S																-
808	Waterfowl	American black duck	Wintering				10S																-
	Waterfowl	Bufflehead	Wintering				10S																-
	Waterfowl	Canada goose	Wintering				100S																-
	Waterfowl	Mallard	Wintering				Present																-
	Waterfowl	Tundra swan	Wintering				10S																-
1086	Diving	Common loon	Wintering				100S																-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
	Diving	D. crested cormorant	Migration		1,000S													-	Mar-May	Aug-Nov	-	-
	Diving	Grebes	Wintering		100S													-	-	-	-	-
	Diving	Red-throated loon	Wintering		100S													-	-	-	-	-
	Pelagic	Northern gannet	Wintering		100S													-	-	-	-	-
	Waterfowl	Scoters	Wintering		10,000S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
1662	Diadromous	Alewife	Migration		-													-	-	-	Aug-Nov	Mar-May
	Diadromous	American shad	Migration		-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Blueback herring	Migration		-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Hickory shad	Migration		-													-	-	-	Jun-Oct	Feb-Jun
	Diadromous	Striped bass	Migration		-													-	-	-	-	Mar-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-	-													-	-	-	-

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F E/E E	Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
1849	Whale	Humpback whale	General Distribution		Very Rare													-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon	Wintering		Present													-	-	-	-
		Grebes	Wintering		100S													-	-	-	-
	Pelagic	Red-throated loon	Wintering		Present													-	-	-	-
		Northern gannet	Wintering		Present													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering		100S													-	-	-	-
		Scoters	Wintering		100S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diadromous	Alewife			Moderate Run													-	-	Aug-Nov	Mar-May
	American shad	Migration			Strong Run													-	-	Aug-Nov	Mar-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec
	Blueback herring	Migration			Moderate Run													-	-	Aug-Nov	Feb-Jun
	Hickory shad	Migration			Moderate Run													-	-	Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	Jan-Dec	Jan-Dec
	Shortnose sturgeon	Migration	E/E	E	-													-	-	-	Mar-Jun
	Striped bass	Nursery Area			-													-	Apr-Jun	Jan-Dec	-

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Turtle	K. ridley sea turtle	E/E	E	Common													-	-	Apr-Oct	-
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	Nov-Dec	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Crab	Blue crab			Highly Abundant-Summ													-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS






Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Calving	Pupping	Molt	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Manatee	West Indian manatee	-/E	E	Rare													-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)



BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Brown pelican																-	-	-	-
	Brown pelican																	-	-	-	-
	D. crested cormorant																	-	-	-	-
	D. crested cormorant																	-	Mar-May	Aug-Nov	-
	Gull/Tern	Gulls																-	-	-	-
	Terns																	-	-	-	-
	Pelagic	Storm-petrels																-	-	-	-


FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	Alewife													-	-	-	Jan-May	Jan-Dec
	American eel													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jan-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Resident Fish													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Silversides													Apr-Sep	-	-	-	Jan-Dec
	Anchovies													-	-	-	May-Oct	May-Oct
	Striped burrfish													-	-	-	-	Jun-Sep
	Atlantic spadefish													-	-	-	-	May-Oct
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Eastern oyster													May-Dec*	-	-	Jan-Dec	Jan-Dec
	Crab													-	-	-	Jan-Dec	Jan-Dec
	Softshell clam													-	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	171.67	0.27
10B	Freshwater Marshes	2.95	0.00
10C	Swamps	171.95	0.27
10D	Scrub and Shrub Wetlands	25.95	0.04
7	Exposed Tidal Flats	2.53	0.00

ESI SHORELINE HABITAT TYPES

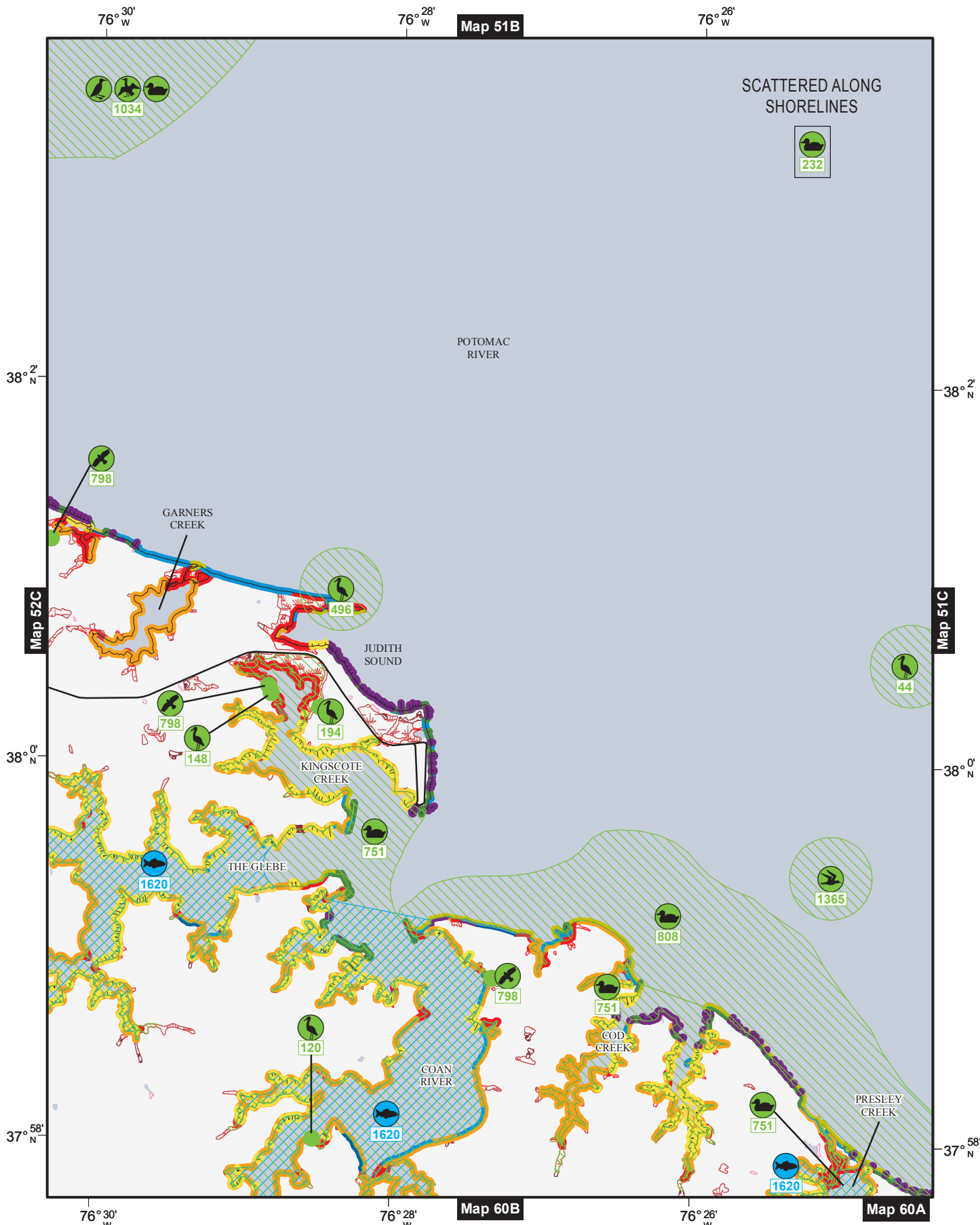
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	15,506.39	9.64	33%
10C	Swamps	1,915.11	1.19	4%
10D	Scrub and Shrub Wetlands	1,508.46	0.94	3%
9B	Vegetated Low Banks	1,762.74	1.10	4%
8B	Sheltered, Solid Man-Made Structures	862.24	0.54	2%
8C	Sheltered Riprap	1,127.42	0.70	2%
7	Exposed Tidal Flats	12,239.32	7.61	26%
6B	Riprap	6,637.60	4.12	14%
4	Coarse Grained Sand Beaches	3,945.10	2.45	9%
1B	Exposed, Solid Man-Made Structures	897.91	0.56	2%

Total ESI Shoreline: 46,402.29 Total ESI Shoreline: 28.83
 Total Shoreline: 29,668.26 Total Shoreline: 18.44

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

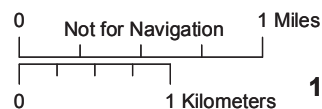




Map 51D
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



Map 51D
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS




Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
44	Wading	Great blue heron	Nesting				62 Pairs													Feb-Jun	-	-	-
120	Wading	Great blue heron	Nesting				5 Nests													Feb-Jun	-	-	-
148	Wading	Great blue heron	Nesting				32 Nests													Feb-Jun	-	-	-
194	Wading	Great blue heron	Nesting				44 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
496	Wading	Great blue heron	Nesting				2 Pairs													Feb-Jun	-	-	-
751	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American coot	Wintering				10S													-	-	-	-
	Waterfowl	American wigeon	Wintering				Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				1,000S													-	-	-	-
	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
808	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				Present													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
1034	Diving	Common loon	Wintering				10S													-	-	-	-
	Diving	D. crested cormorant	Wintering				1,000S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering				10S													-	-	-	-
	Diving	Red-throated loon	Wintering				10S													-	-	-	-
	Pelagic	Northern gannet	Wintering				100S													-	-	-	-
	Waterfowl	Scoters	Wintering				1,000S													-	-	-	-
1365	Gull/Tern	G. black-backed gull	Nesting				10 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting				314 Pairs													Apr-Jul	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
1620	Diadromous	Alewife	Migration			-													-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration			-													-	-	Aug-Nov	Mar-Jun

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Diving	Common loon	Wintering			Present												-	-	-	
		Grebes	Wintering			100S												-	-	-	
	Pelagic	Red-throated loon	Wintering			Present												-	-	-	
		Northern gannet	Wintering			Present												-	-	-	
	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-	
		Canada goose	Wintering			10,000S												-	-	-	
		Canvasback	Wintering			1,000S												-	-	-	
		Common goldeneye	Wintering			100S												-	-	-	
		Long-tailed duck	Wintering			100S												-	-	-	
		Mergansers	Wintering			100S												-	-	-	
		Redhead	Wintering			10S												-	-	-	
		Ring-necked duck	Wintering			100S												-	-	-	
		Ruddy duck	Wintering			10,000S												-	-	-	
		Scaup	Wintering			1,000S												-	-	-	
		Scoters	Wintering			100S												-	-	-	
		Snow goose	Wintering			Present												-	-	-	
		Tundra swan	Wintering			1,000S												-	-	-	

FISH

Subelement	Species	Mapping Qualifier	MDVA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Diadromous	Alewife	Migration		Moderate Run													-	-	-	Mar-May
		American shad	Migration		Strong Run													-	-	-	Mar-Jun
		Atlantic sturgeon	General Distribution	-/E	E													-	-	-	Jan-Dec
		Blueback herring	Migration		Moderate Run													-	-	-	Aug-Nov
		Hickory shad	Migration		Moderate Run													-	-	-	Feb-Jun
		Shortnose sturgeon	General Distribution	E/E	E													-	-	-	Jan-Dec
		Shortnose sturgeon	Migration	E/E	E													-	-	-	Mar-Jun
		Striped bass	Nursery Area		-													-	-	-	Jan-Dec

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MDVA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Turtle	K. ridley sea turtle	General Distribution	E/E	E													-	-	-	Nov-Dec
		K. ridley sea turtle	General Distribution	E/E	E													-	-	-	Apr-Oct
		Loggerhead sea turtle	General Distribution	T/T	T													-	-	-	Nov-Dec
		Loggerhead sea turtle	General Distribution	T/T	T													-	-	-	Apr-Oct

Central Bay: Map 51D

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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Crab	Blue crab	Concentration Area			Highly Abundant-Summ																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS


Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
Gull/Tern	D. crested cormorant													-	Mar-May	Aug-Nov	-
	Gulls													-	-	-	-
	Terns													-	-	-	-

FISH



Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
Estuarine Resident	White perch													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Marine Benthic	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec

Central Bay: Map 51D

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Marine Pelagic													-	-	-	Jan-Dec	Jan-Dec
	Spotted hake																Jul-Sep	Mar-Nov
	Butterfish																-	May-Nov
	Harvestfish																	

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Eastern oyster													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Softshell clam													May-Dec*	-	-	Jan-Dec	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin													-	-	-	-
	Bottlenose dolphin																

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	154.33	0.24
10B	Freshwater Marshes	4.31	0.01
10C	Swamps	79.64	0.12
10D	Scrub and Shrub Wetlands	15.92	0.02
7	Exposed Tidal Flats	2.69	0.00

ESI SHORELINE HABITAT TYPES

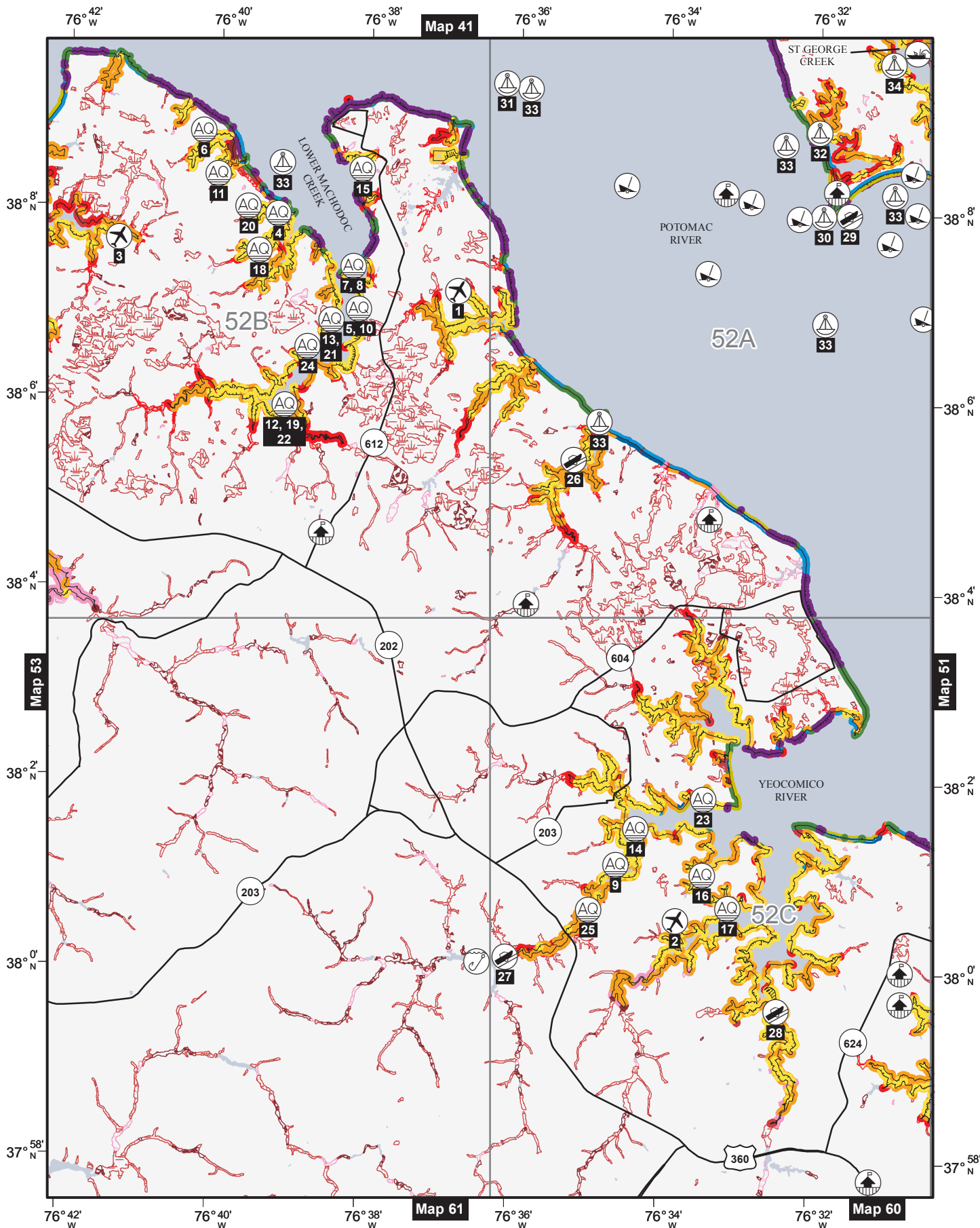
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	18,135.62	11.27	14%
10C	Swamps	808.99	0.50	1%
10D	Scrub and Shrub Wetlands	416.82	0.26	< 1%
9A	Sheltered Tidal Flats	152.00	0.09	< 1%
9B	Vegetated Low Banks	51,288.88	31.87	39%
8B	Sheltered, Solid Man-Made Structures	18,209.23	11.31	14%
8C	Sheltered Riprap	9,869.34	6.13	7%
7	Exposed Tidal Flats	8,838.43	5.49	7%
6B	Riprap	8,371.53	5.20	6%
4	Coarse Grained Sand Beaches	10,117.31	6.29	8%
3A	Fine to Medium Grained Sand Beaches	83.86	0.05	< 1%
3B	Scarps and Steep Slopes (Sand)	1,249.33	0.78	1%
1B	Exposed, Solid Man-Made Structures	4,716.70	2.93	4%

Total ESI Shoreline: 132,258.03 Total ESI Shoreline: 82.18
 Total Shoreline: 114,091.71 Total Shoreline: 70.89

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 52

Central Bay



SEE BACK OF MAP
for details about mapped resources and
other resources that occur in mapped area.
Data Published: September 2016

0 2 Miles
Not for Navigation
0 2 Kilometers

1:100,000



Map 52
Central Bay

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				Contact	Phone
Map ID	Type	Name			
1	AIRPORT	SANFORD FIELD			
2	AIRPORT	SHIVOK			
3	AIRPORT	WHITHALL FARM			
4	AQUACULTURE	OYSTER COMMERCIAL GROAT RF#020331		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	AQUACULTURE	OYSTER NON-COMM BORMAN RF#98-0761		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
6	AQUACULTURE	OYSTER NON-COMM CHES BAY GOVERNOR'S RF#99-2003		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
7	AQUACULTURE	OYSTER NON-COMM CORNWELL RF#98-1434		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
8	AQUACULTURE	OYSTER NON-COMM CORNWELL RF#981190		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
9	AQUACULTURE	OYSTER NON-COMM DENTON, STEPHEN J. RF#98-1504		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
10	AQUACULTURE	OYSTER NON-COMM DREW RF#99-1250		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
11	AQUACULTURE	OYSTER NON-COMM EVANS, JOHN W. RF#99-0177		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
12	AQUACULTURE	OYSTER NON-COMM FEUERSTEIN RF#98-1754		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
13	AQUACULTURE	OYSTER NON-COMM FOURNIER RF#98-1959		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
14	AQUACULTURE	OYSTER NON-COMM FREEMAN, ANNE H. RF#2000-1799		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
15	AQUACULTURE	OYSTER NON-COMM HICKOX RF#980775		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
16	AQUACULTURE	OYSTER NON-COMM HOFFMAN, KATHERINE RF#98-1770		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
17	AQUACULTURE	OYSTER NON-COMM JOHNSON RF#98-1148		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
18	AQUACULTURE	OYSTER NON-COMM PLOGER, WAYNE D. RF#98-1981		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
19	AQUACULTURE	OYSTER NON-COMM PULLEY RF#98-1864		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
20	AQUACULTURE	OYSTER NON-COMM RENFRO, JAMES G. RF#99-1955		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
21	AQUACULTURE	OYSTER NON-COMM RILEY RF#98-1979		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
22	AQUACULTURE	OYSTER NON-COMM SKAPARS RF#98-2252		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
23	AQUACULTURE	OYSTER NON-COMM STICKLER, SHAWN RF#99-1265		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
24	AQUACULTURE	OYSTER NON-COMM WARING, ROBERT L. RF#2001-0614		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
25	AQUACULTURE	OYSTER NON-COMM WOOLEY RF#98-1975		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
26	BOAT RAMP	BONUM'S CREEK		VA DEPARTMENT OF GAME AND INLAND FISHERIES	804-367-1000
27	BOAT RAMP	GARDY'S MILL POND		LENE PENNINGTON, VDGIF	804-367-0058
28	BOAT RAMP	LODGE LANDING		LENE PENNINGTON, VDGIF	804-367-0058
29	BOAT RAMP	PINEY POINT LIGHTHOUSE MUSEUM AND PARK		ST. MARY'S COUNTY - DEPT. OF REC. AND PARKS	
30	REPEATED MEASUREMENT SITE	DB - NOS, 8578240 - PINEY POINT, MD		NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
31	REPEATED MEASUREMENT SITE	MWS - SITE PRRP		GREG PINIAK, PROJECT MANAGER	301-713-3028
32	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, PINEY POINT CREEK		MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
33	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, POTOMAC RIVER		MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
34	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, ST GEORGES CREEK		MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
ALSO PRESENT IN MAPPED AREA (POLYGONS)				Contact	Phone
Type		Name			
STATE PROTECTED AREA		PINEY POINT SANCTUARY		MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367

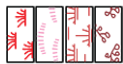
JURISDICTIONS

COUNTY: NORTHUMBERLAND CO., RICHMOND CO., ST. MARY'S CO., WESTMORELAND CO. **FEMA:** REGION I
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE, SECTOR HAMPTON ROADS **EPA:** REGION 3
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT, NORFOLK DISTRICT

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	672.64	1.05
10B	Freshwater Marshes	423.52	0.66
10C	Swamps	3,663.11	5.72
10D	Scrub and Shrub Wetlands	687.43	1.07



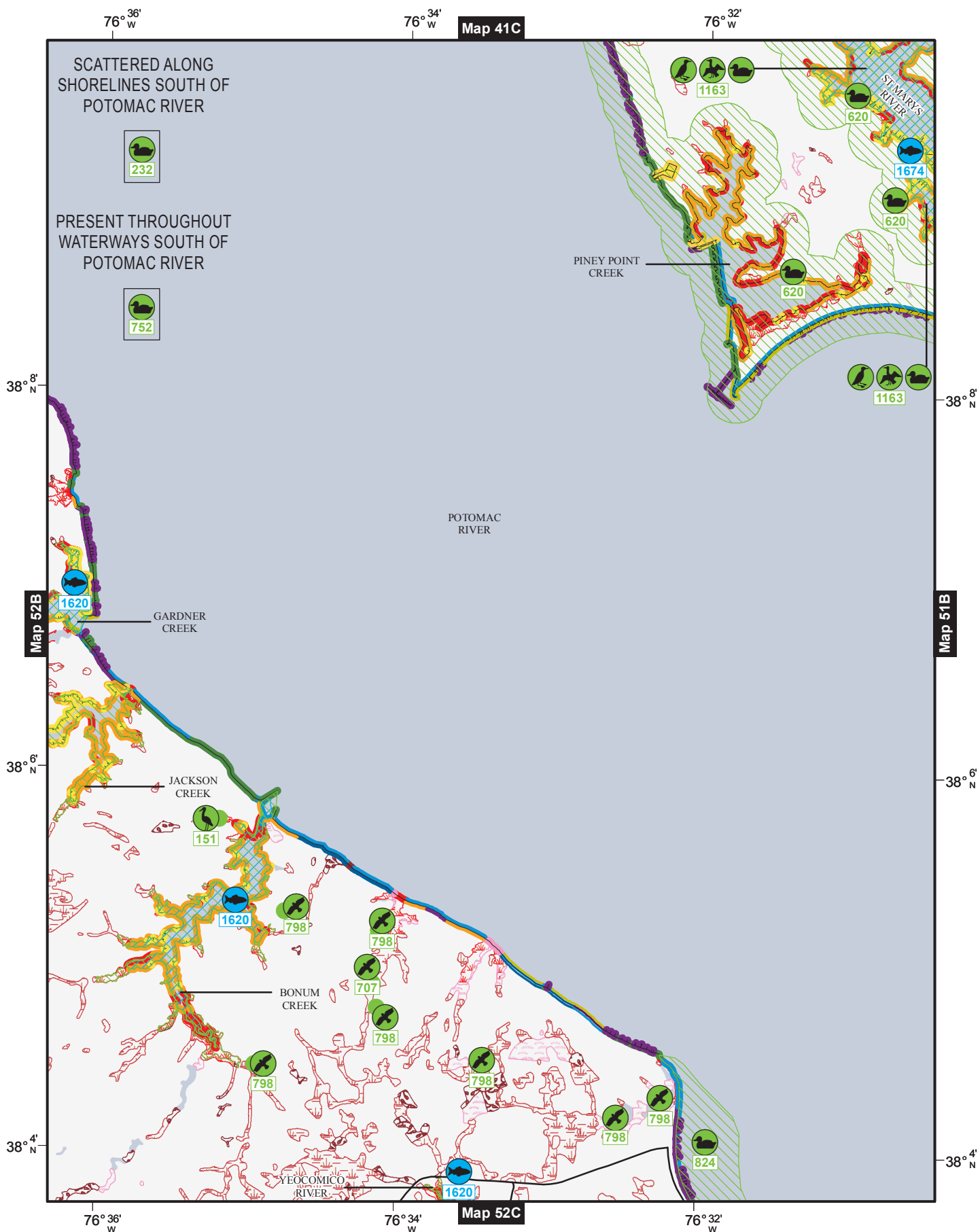
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	64,625.60	40.16	18%
10B	Freshwater Marshes	8,874.61	5.51	2%
10C	Swamps	4,422.67	2.75	1%
10D	Scrub and Shrub Wetlands	2,513.89	1.56	1%
9A	Sheltered Tidal Flats	410.67	0.26	< 1%
9B	Vegetated Low Banks	127,586.26	79.28	35%
8B	Sheltered, Solid Man-Made Structures	45,949.10	28.55	13%
8C	Sheltered Riprap	27,537.06	17.11	8%
7	Exposed Tidal Flats	10,636.69	6.61	3%
6B	Riprap	23,507.67	14.61	6%
5	Mixed Sand and Gravel Beaches	1,089.08	0.68	< 1%
4	Coarse Grained Sand Beaches	23,452.13	14.57	6%
3B	Scarps and Steep Slopes (Sand)	3,726.35	2.32	1%
1B	Exposed, Solid Man-Made Structures	21,956.83	13.64	6%
Total ESI Shoreline:		366,288.62	227.60	
Total Shoreline:		324,120.48	201.40	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

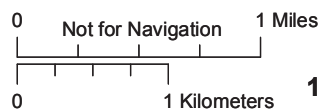




Map 52A
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



1:50,000



Map 52A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS



Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
151	Wading	Great blue heron	Nesting				28 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
620	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	American coot	Wintering				100S													-	-	-	-
	Waterfowl	American wigeon	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Northern pintail	Wintering				10S													-	-	-	-
707	Raptor	Bald eagle	Roosting				-													-	-	-	-
752	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American coot	Wintering				10S													-	-	-	-
	Waterfowl	American wigeon	Wintering				Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				1,000S													-	-	-	-
	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
824	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				100S													-	-	-	-
1163	Diving	Common loon	Wintering				Present													-	-	-	-
	Diving	Grebes	Wintering				100S													-	-	-	-
	Diving	Red-throated loon	Wintering				Present													-	-	-	-
	Pelagic	Northern gannet	Wintering				Present													-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				100S													-	-	-	-
	Waterfowl	Scoters	Wintering				100S													-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D
1620	Diadromous	Alewife	Migration			-													-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration			-													-	-	Aug-Nov	Mar-Jun
	Diadromous	Alewife	Nursery Area			Moderate Run													-	-	Apr-Jun	Mar-May
1674	Diadromous	Blueback herring	Nursery Area			Moderate Run													-	-	May-Jul	Feb-Jun

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			10S													-	-	-	-
		D. crested cormorant			1,000S													-	Mar-May	Aug-Nov	-
		Grebes			10S													-	-	-	-
	Pelagic	Red-throated loon			10S													-	-	-	-
		Northern gannet			100S													-	-	-	-
	Waterfowl	Bufflehead			1,000S													-	-	-	-
		Canada goose			10,000S													-	-	-	-
		Canvasback			1,000S													-	-	-	-
		Common goldeneye			100S													-	-	-	-
		Long-tailed duck			100S													-	-	-	-
		Mergansers			100S													-	-	-	-
		Redhead			100S													-	-	-	-
		Ring-necked duck			100S													-	-	-	-
		Ruddy duck			1,000S													-	-	-	-
		Scaup			1,000S													-	-	-	-
		Scooters			1,000S													-	-	-	-
		Snow goose			Present													-	-	-	-
		Tundra swan			100S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Alewife			Moderate Run													-	-	-	Aug-Nov	Mar-May
		American shad			Strong Run													-	-	-	Aug-Nov	Mar-Jun
		Atlantic sturgeon			-													-	-	-	-	Jan-Dec
		Blueback herring	-/E	E	Moderate Run													-	-	-	Aug-Nov	Feb-Jun
		Hickory shad			Moderate Run													-	-	-	Jun-Oct	Feb-Jun
		Shortnose sturgeon	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
		Shortnose sturgeon	E/E	E	-													-	-	-	-	Mar-Jun
		Striped bass			-													-	-	Apr-Jun	Jan-Dec	-

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Blue crab	Concentration Area			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS



Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt	
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	West Indian manatee	General Distribution	-/E	E	Rare												-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS



Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-
	D. crested cormorant													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-

FISH




Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov

Central Bay: Map 52A

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													-	-	-	-	Apr-Sep
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Softshell clam													May-Dec*	-	-	Jan-Dec	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

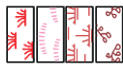
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	167.49	0.26
10B	Freshwater Marshes	89.90	0.14
10C	Swamps	482.92	0.75
10D	Scrub and Shrub Wetlands	79.67	0.12



ESI SHORELINE HABITAT TYPES

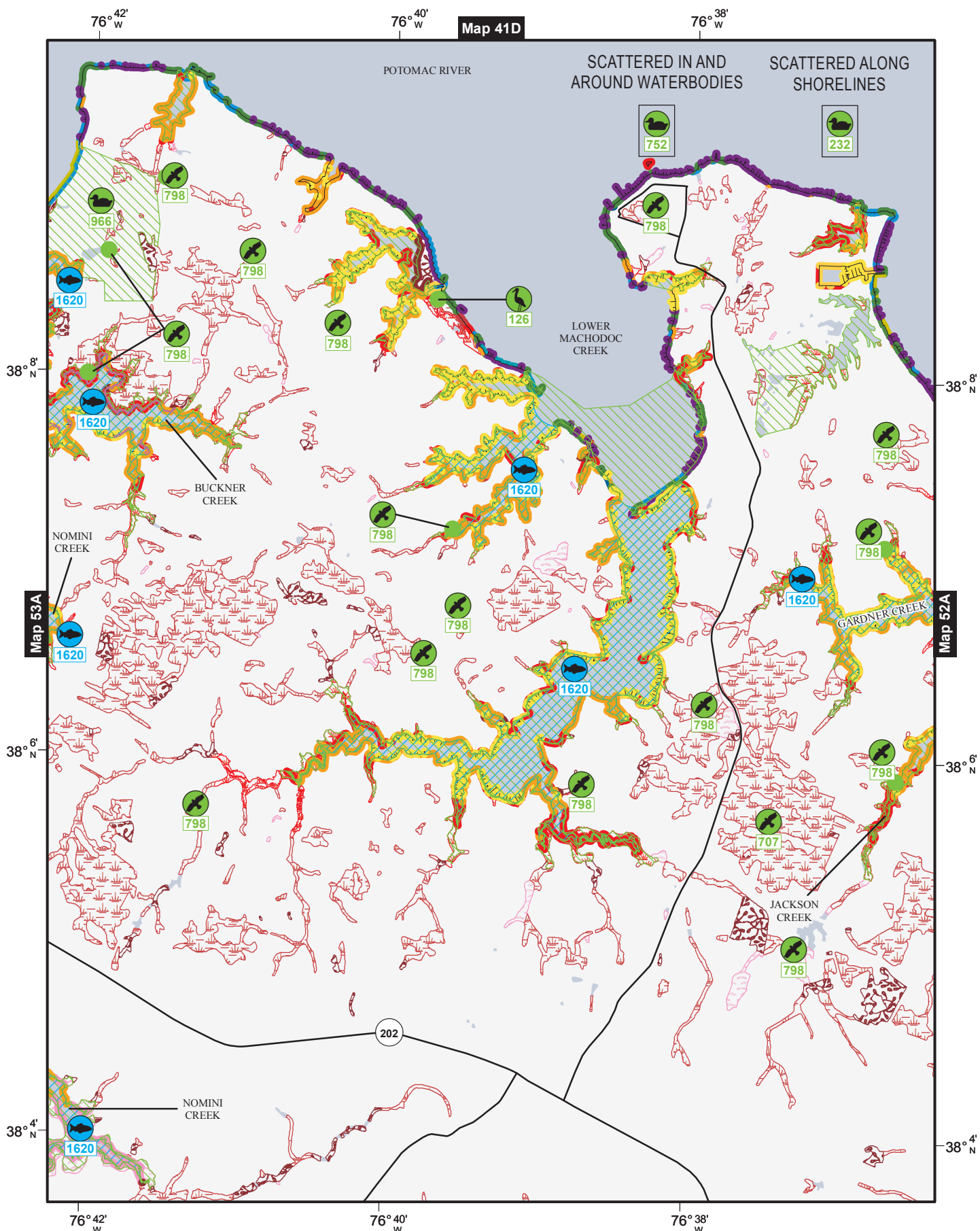
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	17,158.15	10.66	20%
10B	Freshwater Marshes	321.35	0.20	< 1%
10C	Swamps	123.40	0.08	< 1%
10D	Scrub and Shrub Wetlands	78.31	0.05	< 1%
9B	Vegetated Low Banks	25,587.69	15.90	29%
8B	Sheltered, Solid Man-Made Structures	5,260.73	3.27	6%
8C	Sheltered Riprap	2,732.60	1.70	3%
7	Exposed Tidal Flats	5,810.14	3.61	7%
6B	Riprap	7,750.67	4.82	9%
5	Mixed Sand and Gravel Beaches	40.37	0.03	< 1%
4	Coarse Grained Sand Beaches	11,586.54	7.20	13%
3B	Scarps and Steep Slopes (Sand)	2,076.88	1.29	2%
1B	Exposed, Solid Man-Made Structures	8,510.95	5.29	10%

Total ESI Shoreline: 87,037.77 Total ESI Shoreline: 54.08
Total Shoreline: 67,849.21 Total Shoreline: 42.16

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 52B
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 1 Miles
Not for Navigation
0 1 Kilometers

1:50,000



Map 52B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence											
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral											




BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
				S	F		J	F	M	A	M	J	J	A	S	O	N	D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
126	Wading	Great blue heron	Nesting			3 Nests																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence										Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N			
1620	Diadromous	Alewife	Migration			-														Feb-Apr
	Diadromous	Blueback herring	Migration			-														Aug-Nov

BIRDS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Common loon	Wintering			10S													-	-	-	-
	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			10S													-	-	-	-
	Red-throated loon	Wintering			10S													-	-	-	-
	Northern gannet	Wintering			100S													-	-	-	-
	Bufflehead	Wintering			1,000S													-	-	-	-
	Canada goose	Wintering			10,000S													-	-	-	-
	Canvasback	Wintering			1,000S													-	-	-	-
	Common goldeneye	Wintering			100S													-	-	-	-
	Long-tailed duck	Wintering			100S													-	-	-	-
	Mergansers	Wintering			100S													-	-	-	-
	Redhead	Wintering			100S													-	-	-	-
	Ring-necked duck	Wintering			100S													-	-	-	-
	Ruddy duck	Wintering			1,000S													-	-	-	-
	Scaup	Wintering			1,000S													-	-	-	-
	Scoters	Wintering			1,000S													-	-	-	-
	Snow goose	Wintering			Present													-	-	-	-
	Tundra swan	Wintering			100S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife	Migration			Moderate Run													-	-	-	Aug-Nov	Mar-May
	American shad	Migration			Strong Run													-	-	-	Aug-Nov	Mar-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Blueback herring	Migration			Moderate Run													-	-	-	Aug-Nov	Jan-Jun
	Hickory shad	Migration			Moderate Run													-	-	-	Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Shortnose sturgeon	Migration	E/E	E	-													-	-	-	-	Mar-Jun
	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-

INVERTEBRATES



Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	-







BIRDS

Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Eggs	Larvae	Juveniles	Adults
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-

FISH

Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	-	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Nov-Apr	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jan-Dec	Jan-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Silversides													Apr-Sep	-	-	-	Jan-Dec
	Anchovies													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Blue catfish													Apr-Jun	-	-	-	Jan-Dec
	Bullhead catfish													-	-	-	-	Apr-Sep
	Northern searobin													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

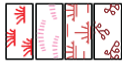
INVERTEBRATES

		Monthly Presence																
	Subelement	Species													Eggs	Larvae	Juveniles	Adults
			J	F	M	A	M	J	J	A	S	O	N	D				
	Bivalve	Eastern oyster													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
		Softshell clam													May-Dec*	May-Jan*	Jan-Dec	Jan-Dec
		Stout razor clam													Jun-Nov	-	Jan-Dec	Jan-Dec
	Crab	Blue crab													-	-	Jan-Dec	Jan-Dec
		Shrimp	Mantis shrimp													-	-	Jan-Dec

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES		
ESI Rank	Habitat Classification	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	0.55
10B	Freshwater Marshes	0.24
10C	Swamps	2.95
10D	Scrub and Shrub Wetlands	0.36



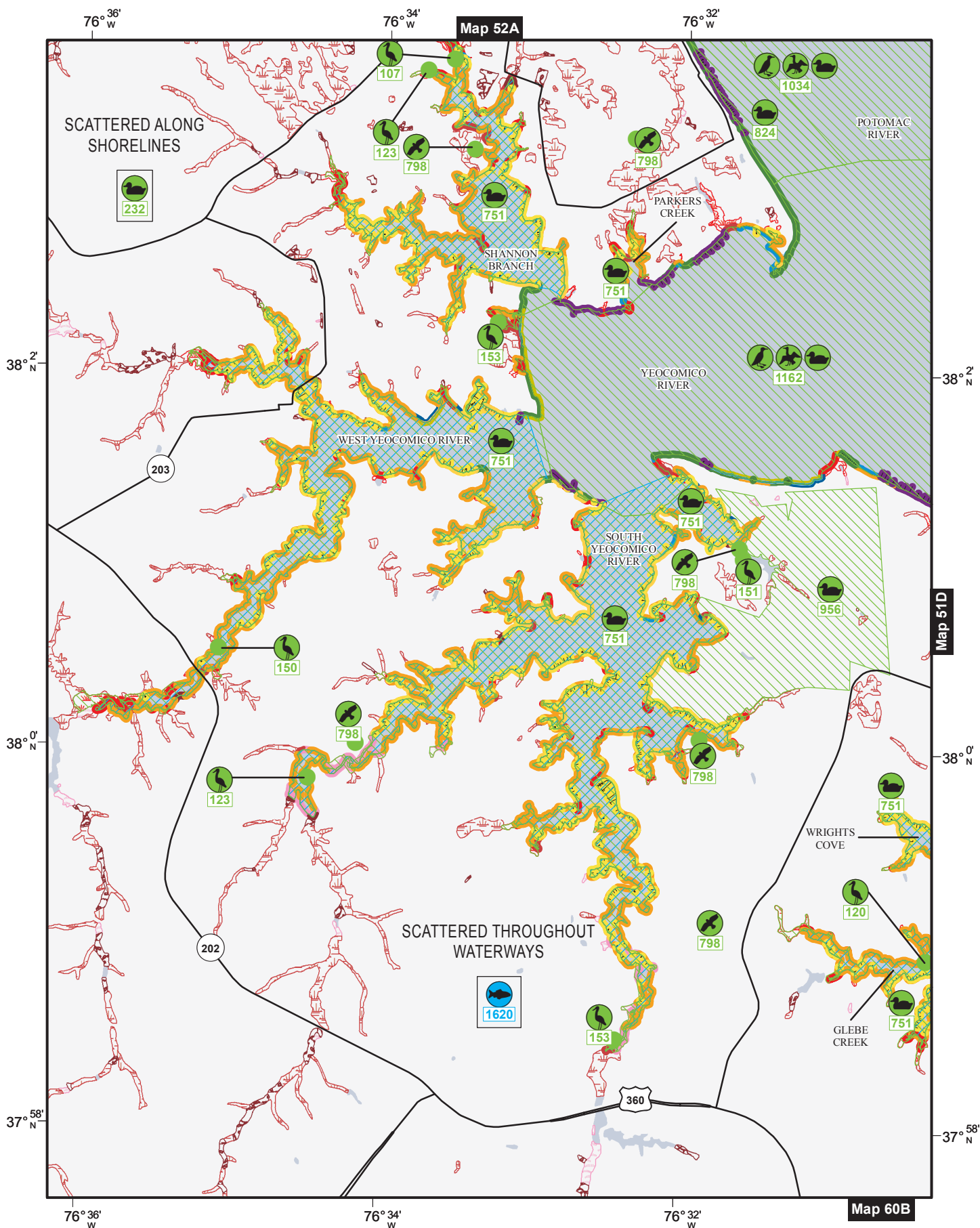
ESI SHORELINE HABITAT TYPES		
ESI Rank	Shoreline Habitat Classification	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	23%
10B	Freshwater Marshes	3%
10C	Swamps	1%
10D	Scrub and Shrub Wetlands	1%
9B	Vegetated Low Banks	29%
8B	Sheltered, Solid Man-Made Structures	13%
8C	Sheltered Riprap	6%
7	Exposed Tidal Flats	1%
6B	Riprap	7%
5	Mixed Sand and Gravel Beaches	1%
4	Coarse Grained Sand Beaches	6%
3B	Scarps and Steep Slopes (Sand)	< 1%
1B	Exposed, Solid Man-Made Structures	7%

Total ESI Shoreline:	128,716.17	Total ESI Shoreline:	79.98
Total Shoreline:	117,908.23	Total Shoreline:	73.26

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

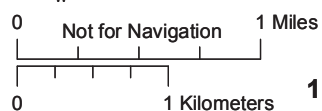




Map 52C
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



Map 60B

1:50,000



Map 52C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
107	Wading	Great blue heron	Nesting				22 Nests													Feb-Jun	-	-	-
120	Wading	Great blue heron	Nesting				5 Nests													Feb-Jun	-	-	-
123	Wading	Great blue heron	Nesting				14 Nests													Feb-Jun	-	-	-
150	Wading	Great blue heron	Nesting				10 Nests													Feb-Jun	-	-	-
151	Wading	Great blue heron	Nesting				28 Nests													Feb-Jun	-	-	-
153	Wading	Great blue heron	Nesting				4 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
751	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American coot	Wintering				10S													-	-	-	-
	Waterfowl	American wigeon	Wintering				Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				1,000S													-	-	-	-
	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
824	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				100S													-	-	-	-
956	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
1034	Diving	Common loon	Wintering				10S													-	-	-	-
	Diving	D. crested cormorant	Wintering				1,000S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering				10S													-	-	-	-
	Diving	Red-throated loon	Wintering				10S													-	-	-	-
	Pelagic	Northern gannet	Wintering				100S													-	-	-	-
	Waterfowl	Scoters	Wintering				1,000S													-	-	-	-
1162	Diving	Common loon	Wintering				Present													-	-	-	-
	Diving	Grebes	Wintering				100S													-	-	-	-
	Diving	Red-throated loon	Wintering				Present													-	-	-	-
	Pelagic	Northern gannet	Wintering				Present													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S												-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S												-	-	-	-	-
	Waterfowl	Mergansers	Wintering			100S												-	-	-	-	-
	Waterfowl	Redhead	Wintering			10S												-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S												-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10,000S												-	-	-	-	-
	Waterfowl	Scaup	Wintering			1,000S												-	-	-	-	-
	Waterfowl	Scoters	Wintering			100S												-	-	-	-	-
	Waterfowl	Snow goose	Wintering			Present												-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			1,000S												-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1620	Diadromous	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
	Canada goose	Wintering			10,000S												-	-	-	-
	Long-tailed duck	Wintering			100S												-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Alewife	Migration			Moderate Run												-	-	-	Aug-Nov	Mar-May
	American shad	Migration			Strong Run												-	-	-	Aug-Nov	Mar-Jun
	Atlantic sturgeon	General Distribution		-/E	-												-	-	-	-	Jan-Dec
	Blueback herring	Migration			Moderate Run												-	-	-	Aug-Nov	Feb-Jun
	Hickory shad	Migration			Moderate Run												-	-	-	Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution		E/E	-												-	-	-	Jan-Dec	Jan-Dec
	Shortnose sturgeon	Migration		E/E	-												-	-	-	-	Mar-Jun
	Striped bass	Nursery Area			-												-	-	Apr-Jun	Jan-Dec	-

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	K. ridley sea turtle	General Distribution		E/E	Uncommon												-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution		E/E	Common												-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution		T/T	Common												-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution		T/T	Abundant												-	-	-	Apr-Oct	Apr-Oct

Central Bay: Map 52C

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
Crab	Blue crab	Concentration Area			Highly Abundant-Summ																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt	
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D
Manatee	West Indian manatee	General Distribution	-/E	E	Rare																

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS


Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-
Gull/Tern	Gulls													-	-	-	-
	Terns													-	-	-	-

FISH



Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
Marine Benthic	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec

Central Bay: Map 52C

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
 Marine Pelagic	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
 Bivalve	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Softshell clam													May-Dec*	-	-	Jan-Dec	Jan-Dec
 Crab	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

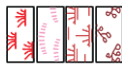
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
 Dolphin	Bottlenose dolphin													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	150.84	0.24
10B	Freshwater Marshes	58.06	0.09
10C	Swamps	743.84	1.16
10D	Scrub and Shrub Wetlands	111.59	0.17



ESI SHORELINE HABITAT TYPES

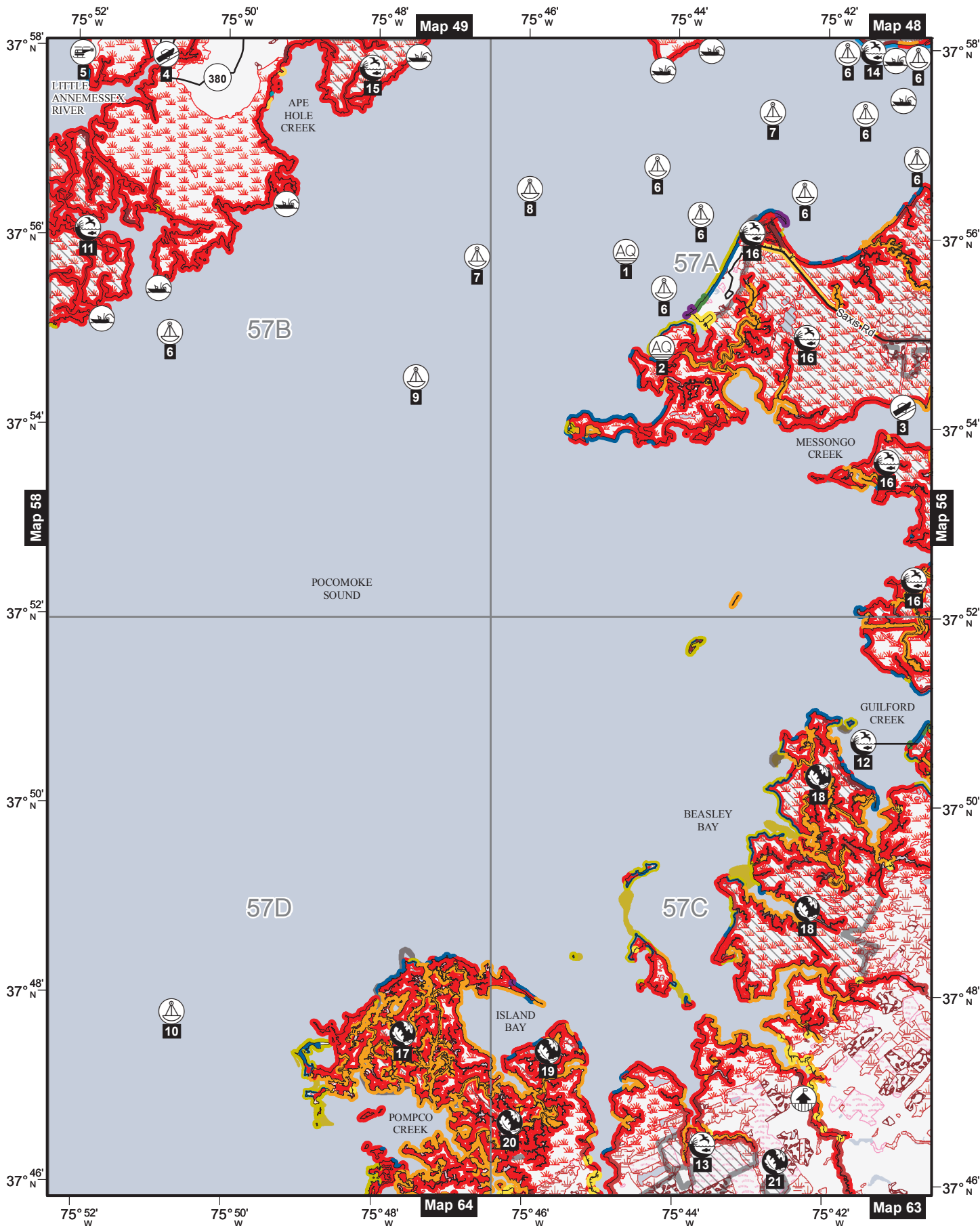
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	17,534.47	10.90	12%
10B	Freshwater Marshes	4,377.88	2.72	3%
10C	Swamps	3,162.80	1.97	2%
10D	Scrub and Shrub Wetlands	952.66	0.59	1%
9A	Sheltered Tidal Flats	410.67	0.26	< 1%
9B	Vegetated Low Banks	64,342.05	39.98	43%
8B	Sheltered, Solid Man-Made Structures	23,381.46	14.53	16%
8C	Sheltered Riprap	17,042.84	10.59	11%
7	Exposed Tidal Flats	3,113.37	1.93	2%
6B	Riprap	6,451.71	4.01	4%
4	Coarse Grained Sand Beaches	4,076.01	2.53	3%
3B	Scarps and Steep Slopes (Sand)	1,441.98	0.90	1%
1B	Exposed, Solid Man-Made Structures	4,246.79	2.64	3%

Total ESI Shoreline: 150,534.68 Total ESI Shoreline: 93.54
 Total Shoreline: 138,363.04 Total Shoreline: 85.97

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

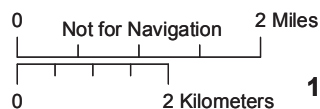




Map 57 Central Bay



SEE BACK OF MAP
for details about mapped resources and
other resources that occur in mapped area.
Data Published: September 2016



1:100,000



HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
Map ID	Type	Name	Contact Phone
1	AQUACULTURE	OYSTER COMMERCIAL DREW HARVEY RF#2002-0453	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
2	AQUACULTURE	OYSTER COMMERCIAL DREW HARVEY RF#2002-1813	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
3	BOAT RAMP	HAMMOCK	LENE PENNINGTON, VDGIF 804-367-0058
4	BOAT RAMP	JENKINS CREEK	SOMERSET COUNTY - ROADS DEPARTMENT
5	HELIPORT	MCCREADY MEMORIAL HOSPITAL	
6	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, POCOMOKE SOUND	MARYLAND DEPARTMENT OF THE ENVIRONMENT 410-537-3608
7	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, POCOMOKE SOUND	MARYLAND DEPARTMENT OF THE ENVIRONMENT 410-537-3608
8	REPEATED MEASUREMENT SITE	WQ - STATION EE3.3	CHESAPEAKE BAY PROGRAM 800-968-7229
9	REPEATED MEASUREMENT SITE	WQ - STATION EE3.4	CHESAPEAKE BAY PROGRAM 800-968-7229
10	REPEATED MEASUREMENT SITE	WQ - STATION EE3.5	CHESAPEAKE BAY PROGRAM 800-968-7229

DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Contact Phone
11	MANAGEMENT AREA	CEDAR ISLAND WMA	WILDLIFE AND HERITAGE SERVICE
12	MANAGEMENT AREA	GUARD SHORE WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES
13	MANAGEMENT AREA	LEVEL PONDS	VA DEPT OF GAME AND INLAND FISHERIES
14	MANAGEMENT AREA	MARYLAND MARINE PROPERTIES WMA	WILDLIFE AND HERITAGE SERVICE
15	MANAGEMENT AREA	POCOMOKE SOUND WMA	WILDLIFE AND HERITAGE SERVICE
16	MANAGEMENT AREA	SAXIS WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES
17	NATURE CONSERVANCY	BIG MARSH	THE NATURE CONSERVANCY 703-841-5300
18	NATURE CONSERVANCY	CLAM MARSHES	THE NATURE CONSERVANCY 703-841-5300
19	NATURE CONSERVANCY	DEEP CREEK FEE	THE NATURE CONSERVANCY 703-841-5300
20	NATURE CONSERVANCY	LONG RIDGE	THE NATURE CONSERVANCY 703-841-5300
21	NATURE CONSERVANCY	THE NATURE CONSERVANCY LAND HOLDING	THE NATURE CONSERVANCY 703-841-5300

ALSO PRESENT IN MAPPED AREA (POLYGONS)			
Type	Name	Contact	Phone
STATE PROTECTED AREA	KITTS CREEK SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	MARKS AND JACKS ISLANDS	VA DEPT OF CONSERVATION AND RECREATION	
STATE PROTECTED AREA	TIDAL LANDS	VA MARINE RESOURCES COMMISSION	

JURISDICTIONS

COUNTY: ACCOMACK COUNTY, SOMERSET COUNTY
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT, NORFOLK DISTRICT

FEMA: REGION I
EPA: REGION 3

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	14,066.27	21.98
10B	Freshwater Marshes	842.10	1.32
10C	Swamps	1,517.47	2.37
10D	Scrub and Shrub Wetlands	565.63	0.88
9A	Sheltered Tidal Flats	14.11	0.02
7	Exposed Tidal Flats	215.69	0.34



ESI SHORELINE HABITAT TYPES

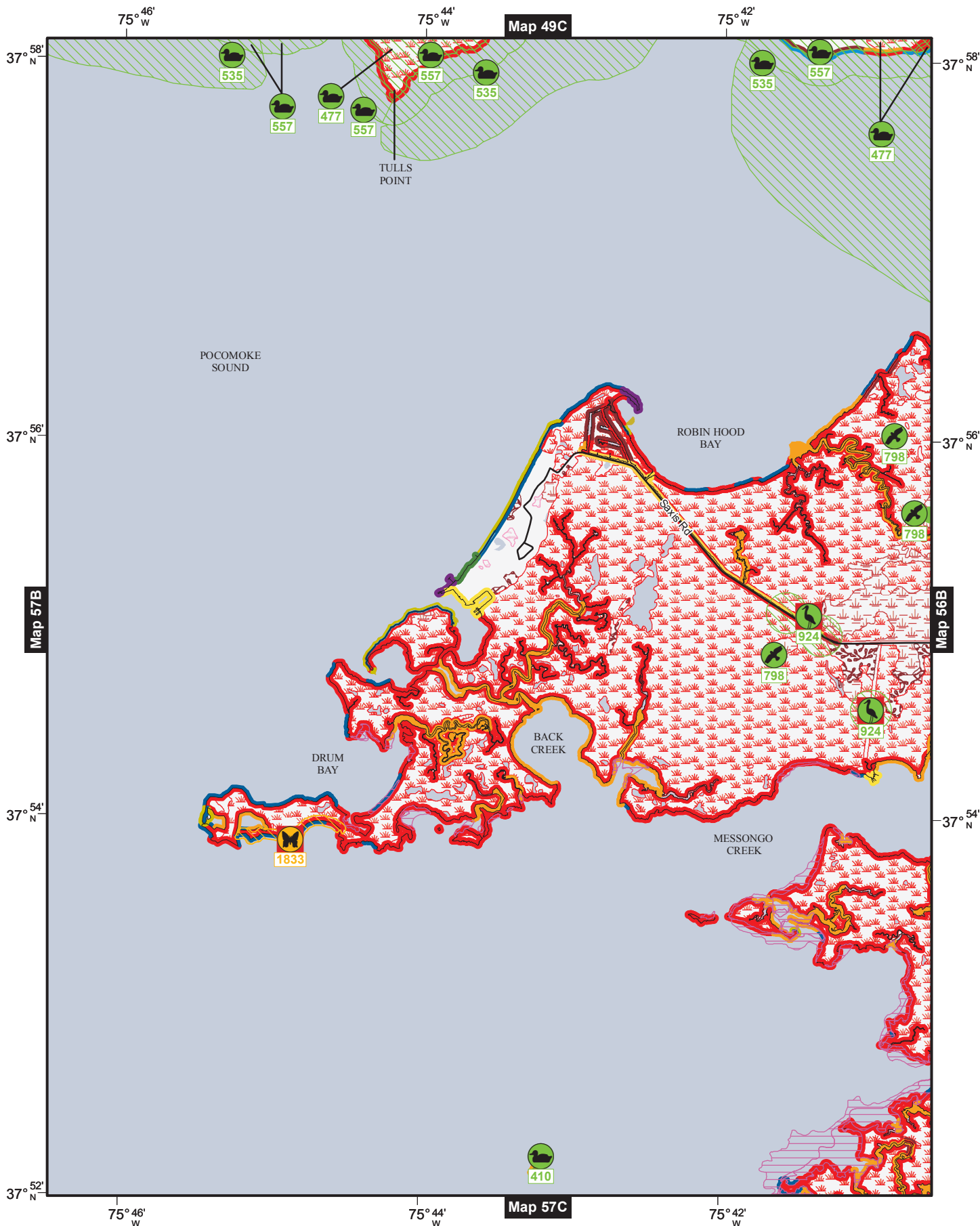
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	620,987.97	385.86	56%
10B	Freshwater Marshes	31.89	0.02	< 1%
10C	Swamps	11,516.44	7.16	1%
10D	Scrub and Shrub Wetlands	9,068.82	5.64	1%
9A	Sheltered Tidal Flats	397,008.06	246.69	36%
9B	Vegetated Low Banks	4,361.90	2.71	< 1%
8B	Sheltered, Solid Man-Made Structures	3,614.97	2.25	< 1%
8C	Sheltered Riprap	3,910.84	2.43	< 1%
7	Exposed Tidal Flats	25,385.06	15.77	2%
6B	Riprap	641.21	0.40	< 1%
5	Mixed Sand and Gravel Beaches	113.01	0.07	< 1%
4	Coarse Grained Sand Beaches	1,523.30	0.95	< 1%
3A	Fine to Medium Grained Sand Beaches	37,725.69	23.44	3%
3B	Scars and Steep Slopes (Sand)	297.45	0.18	< 1%
1B	Exposed, Solid Man-Made Structures	910.79	0.57	< 1%

Total ESI Shoreline: 1,117,097.40 Total ESI Shoreline: 694.13
 Total Shoreline: 634,937.22 Total Shoreline: 394.53

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 57A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		High												
SAV	Submerged aquatic veg	High Ecological Value		Low												




BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence										Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N			
410	Waterfowl	Brant	Wintering		100S												-	-	-
	Waterfowl	Northern pintail	Wintering		100S												-	-	-
	Waterfowl	Tundra swan	Wintering		1,000S												-	-	-
477	Waterfowl	American black duck	Nesting		High												Mar-Aug	-	-
	Waterfowl	Canada goose	Nesting		Moderate-High												Mar-Jun	-	-
535	Waterfowl	Bufflehead	Wintering		1,000S												-	-	-
	Waterfowl	Canada goose	Wintering		100S												-	-	-
	Waterfowl	Canvasback	Wintering		1,000S												-	-	-
	Waterfowl	Common goldeneye	Wintering		10S												-	-	-
	Waterfowl	Mergansers	Wintering		100S												-	-	-
	Waterfowl	Redhead	Wintering		1,000S												-	-	-
	Waterfowl	Ring-necked duck	Wintering		10S												-	-	-
	Waterfowl	Ruddy duck	Wintering		1,000S												-	-	-
	Waterfowl	Scaup	Wintering		100S												-	-	-
557	Waterfowl	Snow goose	Wintering		1,000S												-	-	-
	Waterfowl	American black duck	Wintering		1,000S												-	-	-
	Waterfowl	American coot	Wintering		10S												-	-	-
	Waterfowl	American wigeon	Wintering		100S												-	-	-
	Waterfowl	Gadwall	Wintering		1,000S												-	-	-
	Waterfowl	Green-winged teal	Wintering		1,000S												-	-	-
	Waterfowl	Mallard	Wintering		1,000S												-	-	-
	Waterfowl	Northern pintail	Wintering		10S												-	-	-
	Waterfowl	Northern shoveler	Wintering		Present												-	-	-
798	Raptor	Bald eagle	Nesting		1 Nest												Dec-Jun	-	-
924	Wading	Black rail	Vulnerable Occurrence	E/E	-												May-Jul	-	-


INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA			Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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BIRDS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Common loon	Wintering			Present													-	-	-	-
	Grebes	Wintering			10S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Northern gannet	Wintering			Present													-	-	-	-
	American black duck	Nesting			Present													Apr-Jul	-	-	-
	American black duck	Wintering			1,000S													-	-	-	-
	American black duck	Wintering			100S													-	-	-	-
	American wigeon	Wintering			1,000S													-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-
	Blue-winged teal	Migration			1,000S													-	Feb-Apr	Aug-Oct	-
	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Brant	Wintering			10S													-	-	-	-
	Bufflehead	Wintering			1,000S													-	-	-	-
	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Canada goose	Wintering			1,000S													-	-	-	-
	Canvasback	Wintering			1,000S													-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-
	Gadwall	Wintering			100S													-	-	-	-
	Green-winged teal	Wintering			100S													-	-	-	-
	Green-winged teal	Wintering			1,000S													-	-	-	-
	Long-tailed duck	Wintering			100S													-	-	-	-
	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Mallard	Wintering			100S													-	-	-	-
	Mallard	Wintering			1,000S													-	-	-	-
	Mergansers	Wintering			100S													-	-	-	-
	Northern pintail	Wintering			10S													-	-	-	-
	Northern shoveler	Wintering			Present													-	-	-	-
	Redhead	Wintering			1,000S													-	-	-	-
	Redhead	Wintering			10,000S													-	-	-	-
	Ring-necked duck	Wintering			Present													-	-	-	-
	Ruddy duck	Wintering			10,000S													-	-	-	-
	Scaup	Wintering			1,000S													-	-	-	-
	Scaup	Wintering			100S													-	-	-	-
	Scoters	Wintering			1,000S													-	-	-	-
	Snow goose	Wintering			100S													-	-	-	-
	Tundra swan	Wintering			100S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diadromous																				
	Alewife	Migration			-															Aug-Nov	Feb-Apr
	Alewife	Migration			-															Aug-Nov	Mar-May
	American shad	Migration			-															Aug-Nov	Feb-Jun
	American shad	Migration			-															Aug-Nov	Mar-Jun
	Atlantic sturgeon	General Distribution			-															-	Jan-Dec
	Blueback herring	Migration			-															Aug-Nov	Feb-Jun
	Blueback herring	Migration			-															Aug-Nov	Mar-Jun
	Hickory shad	Migration			-															Jun-Sep	Feb-May
	Hickory shad	Migration			-															Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution			-															Jan-Dec	Jan-Dec
	Striped bass	Migration			-															-	Feb-Jun
	Striped bass	Migration			-															-	Mar-Jun

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Turtle																				
	Diamondback terrapin	Concentration Area			High															Apr-Oct	Apr-Oct
	K. ridley sea turtle	General Distribution			Uncommon															Nov-Dec	-
	K. ridley sea turtle	General Distribution			Common															Apr-Oct	-
	Loggerhead sea turtle	General Distribution			Common															Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution			Abundant															Apr-Oct	Apr-Oct






INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Crab																				
	Blue crab	Concentration Area			Highly Abundant-Summ															Jun-Oct	Jun-Oct
	Blue crab	Concentration Area			Highly Abundant															Jun-Mar*	Jun-Mar*





MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D			
	Manatee																			
	West Indian manatee	General Distribution			Rare															-

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Saltmarsh sharp-tailed sparrow													May-Aug	-	-	-
	Seaside sparrow													May-Jul	-	-	-
	Willet													May-Jul	-	-	-
	Clapper rail													Apr-Sep	-	-	-
	Wood duck													Apr-Jul	-	-	Jul-Aug

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	-	Apr-Nov
	Spotted seatrout													May-Jul	-	-	Nov-Apr	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleamose skate													-	-	-	-	Jan-Dec


FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	Apr-Dec	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep


REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diamondback terrapin													May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	3,987.92	6.23
10B	Freshwater Marshes	5.66	0.01
10C	Swamps	193.03	0.30
10D	Scrub and Shrub Wetlands	75.90	0.12
9A	Sheltered Tidal Flats	7.05	0.01
7	Exposed Tidal Flats	2.54	0.00

ESI SHORELINE HABITAT TYPES

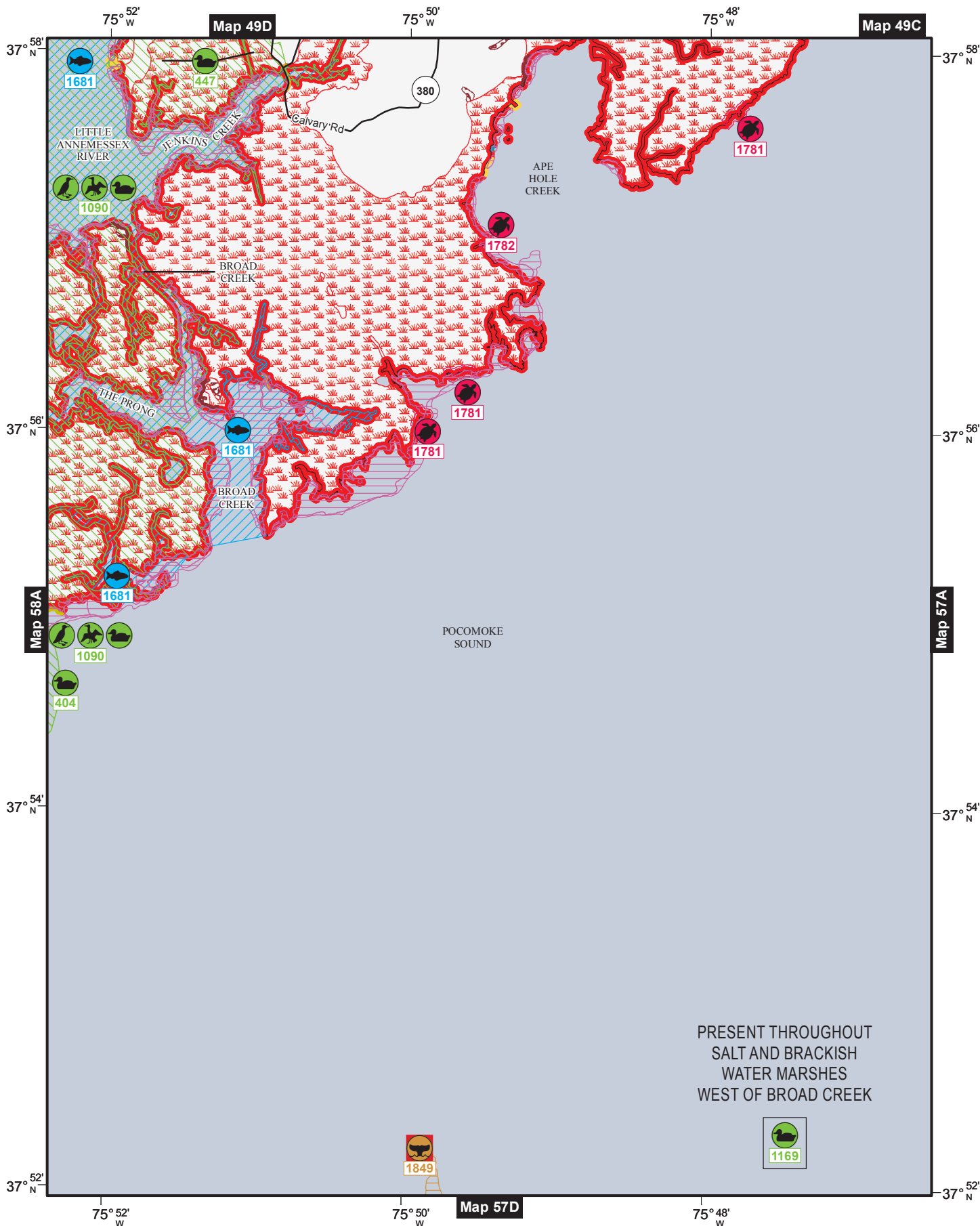
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	142,150.69	88.33	55%
10C	Swamps	381.50	0.24	< 1%
10D	Scrub and Shrub Wetlands	4,909.21	3.05	2%
9A	Sheltered Tidal Flats	86,039.98	53.46	34%
9B	Vegetated Low Banks	490.41	0.30	< 1%
8B	Sheltered, Solid Man-Made Structures	1,802.82	1.12	1%
8C	Sheltered Riprap	3,253.24	2.02	1%
7	Exposed Tidal Flats	3,697.81	2.30	1%
6B	Riprap	327.26	0.20	< 1%
4	Coarse Grained Sand Beaches	1,184.24	0.74	< 1%
3A	Fine to Medium Grained Sand Beaches	11,410.17	7.09	4%
3B	Scarps and Steep Slopes (Sand)	297.45	0.18	< 1%
1B	Exposed, Solid Man-Made Structures	853.08	0.53	< 1%

Total ESI Shoreline: 256,797.87 Total ESI Shoreline: 159.57
 Total Shoreline: 148,905.43 Total Shoreline: 92.53

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

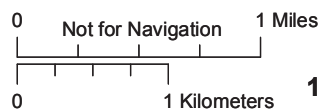




Map 57B Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



1:50,000



Map 57B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
							J	F	M	A	M	J	J	A	S	O	N	D				
SAV	Submerged aquatic veg	High Ecological Value				Ephemeral													-	-	-	-
SAV	Submerged aquatic veg	High Ecological Value				High													-	-	-	-
SAV	Submerged aquatic veg	High Ecological Value				Low													-	-	-	-

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
404	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American wigeon	Wintering				1,000S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				100S													-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				1,000S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Northern pintail	Wintering				100S													-	-	-	-
	Waterfowl	Redhead	Wintering				1,000S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S													-	-	-	-
	Waterfowl	Scaup	Wintering				100S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				1,000S													-	-	-	-
	Waterfowl	American black duck	Nesting				Moderate													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Nesting				Moderate-High													Mar-Aug	-	-	Jul-Aug
	1090	Diving	Common loon				100S													-	Mar-May	Aug-Nov	-
	Diving	D. crested cormorant	Migration				1,000S													-	-	-	-
	Diving	Grebes	Wintering				100S													-	-	-	-
	Pelagic	Northern gannet	Wintering				100S													-	-	-	-
	Waterfowl	Scoters	Wintering				10,000S													-	-	-	-
	1169	Waterfowl	American black duck				Moderate-High													Mar-Aug	-	-	Jul-Aug
			Nesting																	-	-	-	-
																				-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
1681	Diadromous	Alewife	Nursery Area				-													-	-	Apr-Jun	May-Jun	Mar-May
	Diadromous	Blueback herring	Nursery Area				-													-	-	May-Jul	May-Oct	Feb-Jun

REPTILES & AMPHIBIANS




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1781	Turtle	Diamondback terrapin	Nesting			Possible Nest												May-Aug	-	-	Apr-Oct	Apr-Oct
1782	Turtle	Diamondback terrapin	Nesting			Probable Nest												May-Aug	-	-	Apr-Oct	Apr-Oct

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
1849	Whale	Humpback whale	General Distribution	E/E	E	Very Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Common loon	Wintering			Present													-	-	-	-
		Wintering			10S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
		Wintering			Present													-	-	-	-
	American black duck	Wintering			1,000S													-	-	-	-
		Wintering			10S													-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-
		Wintering			1,000S													-	-	-	-
	Bufflehead	Wintering			1,000S													-	-	-	-
		Wintering			1,000S													-	-	-	-
	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug
		Wintering			100S													-	-	-	-
	Canvasback	Wintering			1,000S													-	-	-	-
		Wintering			1,000S													-	-	-	-
	Common goldeneye	Wintering			10S													-	-	-	-
		Wintering			1,000S													-	-	-	-
	Green-winged teal	Wintering			1,000S													-	-	-	-
		Wintering			100S													-	-	-	-
	Long-tailed duck	Wintering			1,000S													-	-	-	-
		Wintering			100S													-	-	-	-
	Mallard	Wintering			100S													-	-	-	-
		Wintering			100S													-	-	-	-
	Mergansers	Wintering			100S													-	-	-	-
		Wintering			10S													-	-	-	-
	Northern pintail	Wintering			Present													-	-	-	-
		Wintering			1,000S													-	-	-	-
	Redhead	Wintering			10,000S													-	-	-	-
		Wintering			Present													-	-	-	-
	Ring-necked duck	Wintering			10S													-	-	-	-
		Wintering			1,000S													-	-	-	-
	Ruddy duck	Wintering			10,000S													-	-	-	-
		Wintering			100S													-	-	-	-
	Scaup	Wintering			1,000S													-	-	-	-
		Wintering			1,000S													-	-	-	-
	Sooters	Wintering																-	-	-	-


BIRDS (continued)

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Snow goose	Wintering			1,000S												-	-	-	-	-
	Tundra swan	Wintering			100S												-	-	-	-	-
	Wood duck	Nesting			Moderate-High												Mar-Jun	-	-	-	Jul-Aug


FISH

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr
	Alewife	Migration			-												-	-	-	Aug-Nov	Mar-May
	American shad	Migration			-												-	-	-	Aug-Nov	Mar-Jun
	American shad	Migration			-												-	-	-	Aug-Nov	Feb-Jun
	Atlantic sturgeon	General Distribution			-												-	-	-	-	Jan-Dec
	Blueback herring	Migration			-												-	-	-	Aug-Nov	Feb-Jun
	Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-												-	-	-	Jun-Sep	Feb-May
	Hickory shad	Migration			-												-	-	-	Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution			-												-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-												-	-	-	-	Mar-Jun
	Striped bass	Migration			-												-	-	-	-	Feb-Jun

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	K. ridley sea turtle	General Distribution			Uncommon												-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution			Common												-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution			Abundant												-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution			Common												-	-	-	Nov-Dec	Nov-Dec





INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Blue crab	Concentration Area			Highly Abundant												-	-	-	Jun-Mar*	Jun-Mar*
	Blue crab	Concentration Area			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct






MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	West Indian manatee	General Distribution			Rare													-	-	-
	West Indian manatee	General Distribution			Rare													-	-	-

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Saltmarsh sharp-tailed sparrow													May-Aug	-	-	-
	Seaside sparrow													May-Jul	-	-	-
	Willet													May-Jul	-	-	-
	Clapper rail													Apr-Sep	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	-	Apr-Dec
	Spotted seatrout													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													May-Jul	-	-	Apr-Nov	Apr-Nov
	Weakfish													-	-	Feb-May	Apr-Dec	Jan-Dec
	White perch													-	-	May-Aug	Jun-Dec	Apr-Dec
	Winter flounder													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	-	Dec-Mar
	Silversides													-	-	-	Jan-Dec	Jan-Dec
	Anchovies													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Striped burrfish													Apr-Sep	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Clearnose skate													-	-	-	-	Jun-Sep

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	Apr-Dec	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	3,598.63	5.62
10D	Scrub and Shrub Wetlands	18.97	0.03
7	Exposed Tidal Flats	1.64	0.00



ESI SHORELINE HABITAT TYPES

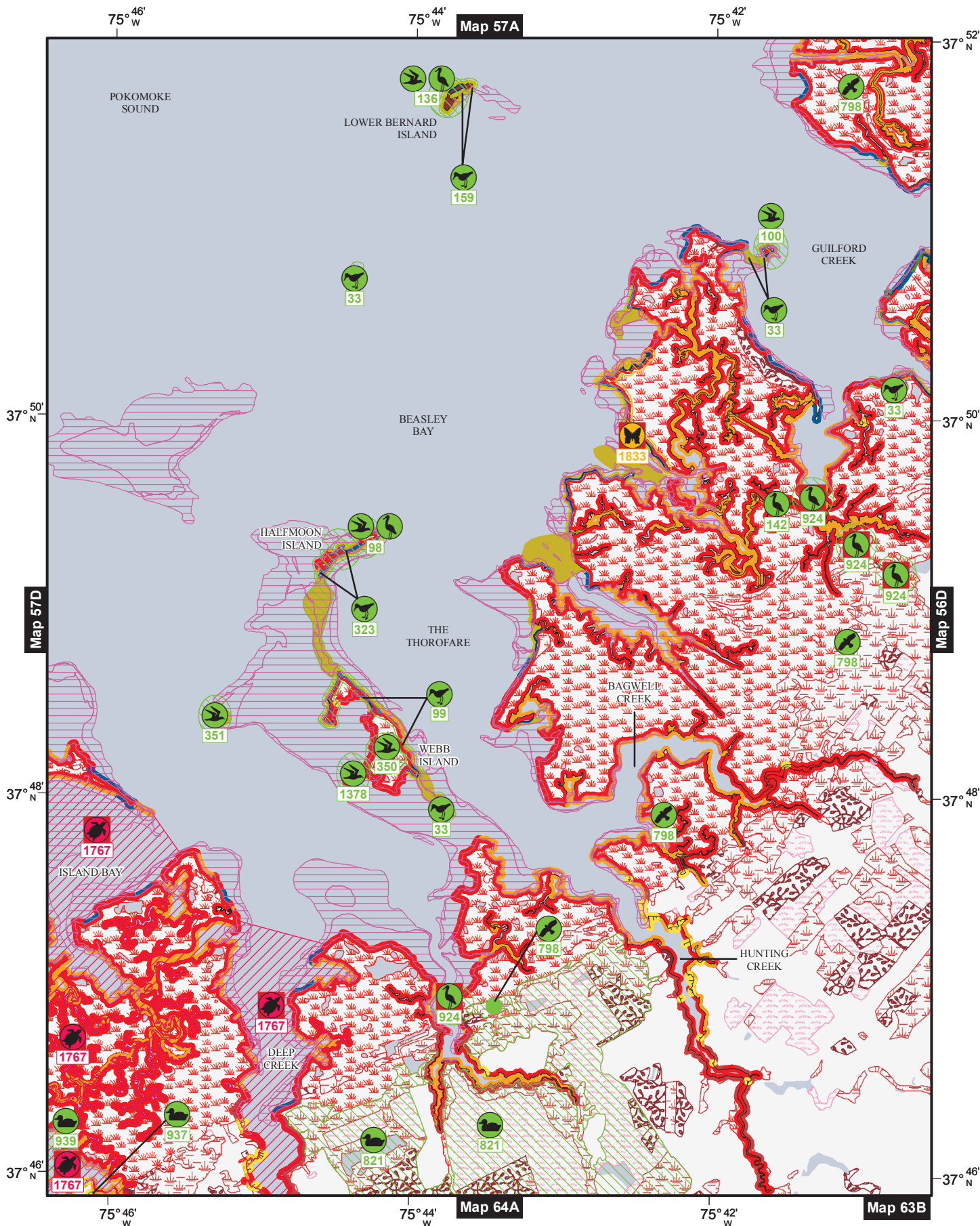
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	92,029.18	57.18	97%
10D	Scrub and Shrub Wetlands	1,358.20	0.84	1%
9B	Vegetated Low Banks	328.75	0.20	< 1%
8B	Sheltered, Solid Man-Made Structures	33.81	0.02	< 1%
8C	Sheltered Riprap	522.83	0.32	1%
7	Exposed Tidal Flats	298.17	0.19	< 1%
5	Mixed Sand and Gravel Beaches	74.42	0.05	< 1%
4	Coarse Grained Sand Beaches	339.96	0.21	< 1%

Total ESI Shoreline: 94,985.32 Total ESI Shoreline: 59.02
 Total Shoreline: 92,235.05 Total Shoreline: 57.31

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

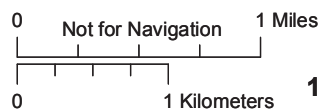




Map 57C
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



Map 57C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		High												
SAV	Submerged aquatic veg	High Ecological Value		Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
33	Shorebird	American oystercatcher	Nesting			1 Pair												Apr-Aug	-	-	-	
98	Gull/Tern	G. black-backed gull	Nesting			40 Pairs												Apr-Jun	-	-	-	
	Gull/Tern	Herring gull	Nesting			220 Pairs												May-Aug	-	-	-	
	Wading	Great egret	Nesting			29 Nests												Apr-Aug	-	-	-	
	Wading	Snowy egret	Nesting			30 Pairs												Apr-Aug	-	-	-	
	Wading	Tricolored heron	Nesting			1 Pair												May-Aug	-	-	-	
99	Shorebird	American oystercatcher	Nesting			14 Pairs												Apr-Aug	-	-	-	
100	Gull/Tern	Common tern	Nesting			2 Pairs												May-Aug	-	-	-	
	Gull/Tern	Forster's tern	Nesting			19 Pairs												May-Jul	-	-	-	
136	Gull/Tern	G. black-backed gull	Nesting			38 Pairs												Apr-Jun	-	-	-	
	Gull/Tern	Herring gull	Nesting			37 Pairs												May-Aug	-	-	-	
	Wading	Great egret	Nesting			3 Nests												Apr-Aug	-	-	-	
	Wading	Snowy egret	Nesting			1 Pair												Apr-Aug	-	-	-	
142	Wading	Great blue heron	Nesting			44 Nests												Feb-Jun	-	-	-	
	Wading	Great egret	Nesting			1 Nest												Apr-Aug	-	-	-	
159	Shorebird	American oystercatcher	Nesting			2 Pairs												Apr-Aug	-	-	-	
323	Shorebird	American oystercatcher	Nesting			7 Pairs												Apr-Aug	-	-	-	
350	Gull/Tern	G. black-backed gull	Nesting			16 Pairs												Apr-Jun	-	-	-	
	Gull/Tern	Herring gull	Nesting			6 Pairs												May-Aug	-	-	-	
351	Gull/Tern	Forster's tern	Nesting			3 Pairs												May-Jul	-	-	-	
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-	
821	Waterfowl	Bufflehead	Wintering			10S												-	-	-	-	
	Waterfowl	Canvasback	Wintering			100S												-	-	-	-	
	Waterfowl	Northern shoveler	Wintering			10S												-	-	-	-	
	Waterfowl	Ruddy duck	Wintering			100S												-	-	-	-	
924	Wading	Black rail	Vulnerable Occurrence	E/E	-													May-Jul	-	-	-	
937	Waterfowl	Canvasback	Wintering			100S												-	-	-	-	
	Waterfowl	Redhead	Wintering			100S												-	-	-	-	
	Waterfowl	Ring-necked duck	Wintering			10S												-	-	-	-	
	Waterfowl	Ruddy duck	Wintering			100S												-	-	-	-	

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Nest	Hatch	Interst	Juveniles	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
939	Waterfowl	Scaup	Wintering			10S												-				-
	Waterfowl	Blue-winged teal	Migration			10S												-				-
	Waterfowl	Canvasback	Wintering			100S												-				-
	Waterfowl	Green-winged teal	Wintering			10S												-				-
1378	Waterfowl	Ruddy duck	Wintering			100S												-				-
	Gull/Tern	Common tern	Nesting			2 Pairs												May-Aug				-
	Gull/Tern	Forster's tern	Nesting			24 Pairs												May-Jul				-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Nest	Hatch	Interst	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1767	Turtle	Green sea turtle	General Distribution	T/T	T	Rare												-			May-Dec*	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Common												-			Jul-Oct	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-												Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Nest	Hatch	Interst	Juveniles	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1833	Diving	Common loon	Wintering			Present												-				-
		Grebes	Wintering			10S												-				-
1833	Pelagic	Red-throated loon	Wintering			100S												-				-
		Northern gannet	Wintering			Present												-				-
1833	Waterfowl	American black duck	Nesting			Present												Apr-Jul				-
		American black duck	Wintering			1,000S												-				-
1833		American black duck	Wintering			100S												-				-
		American wigeon	Wintering			100S												-				-
1833		American wigeon	Wintering			1,000S												-				-
		Blue-winged teal	Migration			1,000S												-				-
1833		Blue-winged teal	Migration			100S												-				-
		Brant	Wintering			10S												-				-
1833		Bufflehead	Wintering			1,000S												-				-
		Canada goose	Nesting			Present												Mar-Aug				Jun-Jul
1833		Canada goose	Wintering			1,000S												-				-
		Canvasback	Wintering			1,000S												-				-
1833		Gadwall	Wintering			100S												-				-
		Gadwall	Wintering			1,000S												-				-
1833		Green-winged teal	Wintering			100S												-				-
		Green-winged teal	Wintering			1,000S												-				-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	
		Long-tailed duck	Wintering			100S												
		Mallard	Nesting			Present												
		Mallard	Wintering			1,000S												
		Mallard	Wintering			100S												
		Mergansers	Wintering			100S												
		Northern pintail	Wintering			10S												
		Northern shoveler	Wintering			Present												
		Redhead	Wintering			1,000S												
		Redhead	Wintering			10,000S												
		Ring-necked duck	Wintering			Present												
		Ruddy duck	Wintering			10,000S												
		Scaup	Wintering			1,000S												
		Scaup	Wintering			100S												
		Scoters	Wintering			1,000S												
		Snow goose	Wintering			100S												
		Tundra swan	Wintering			100S												

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Alewife	Migration			-															
	American shad	Migration			-															
	Atlantic sturgeon	General Distribution	-/E	E	-															
	Blueback herring	Migration			-															
	Hickory shad	Migration			-															
	Shortnose sturgeon	General Distribution	E/E	E	-															
	Striped bass	Migration			-															

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Diamondback terrapin	Concentration Area			High															
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon															
	K. ridley sea turtle	General Distribution	E/E	E	Common															
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant															
	Loggerhead sea turtle	General Distribution	T/T	T	Common															

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Blue crab	Concentration Area			Highly Abundant-Summ															
	Blue crab	Concentration Area			Highly Abundant															

MARINE MAMMALS

Subelement	Species	Mapping Qualifier General Distribution	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
			S	F	-/E	S	F	-/E	S	F	-/E	S	F	-/E	S	F				
Manatee	West Indian manatee																-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS



Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
Gull/Tern	Gulls													-	-	-	-
	Terns													-	-	-	-
Passerine	Saltmarsh sharp-tailed sparrow													May-Aug	-	-	-
	Seaside sparrow													May-Jul	-	-	-
Shorebird	Willet													May-Jul	-	-	-
Wading	Clapper rail													Apr-Sep	-	-	-
Waterfowl	Wood duck													Apr-Jul	-	-	Jul-Aug

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	Winter flounder													-	-	-	-	Dec-Mar
Estuarine Resident	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct

Central Bay: Map 57C



FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Marine Benthic													-	-	-	-	Jun-Sep
	Atlantic spadefish													-	-	-	-	Jan-Dec
	Clearnose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	Jan-Dec
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	-	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Marine Pelagic													-	-	-	-	May-Nov
	Harvestfish													May-Oct	-	-	-	Jan-Dec
	Lined seahorse													-	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle													May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Eastern oyster													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Softshell clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Cephalopod													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Crab													-	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Shrimp													-	-	-	May-Oct	May-Oct
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	Jan-Dec	Jan-Dec
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

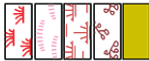
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	4,980.40	7.78
10B	Freshwater Marshes	836.44	1.31
10C	Swamps	1,324.44	2.07
10D	Scrub and Shrub Wetlands	463.42	0.72
7	Exposed Tidal Flats	161.26	0.25



ESI SHORELINE HABITAT TYPES

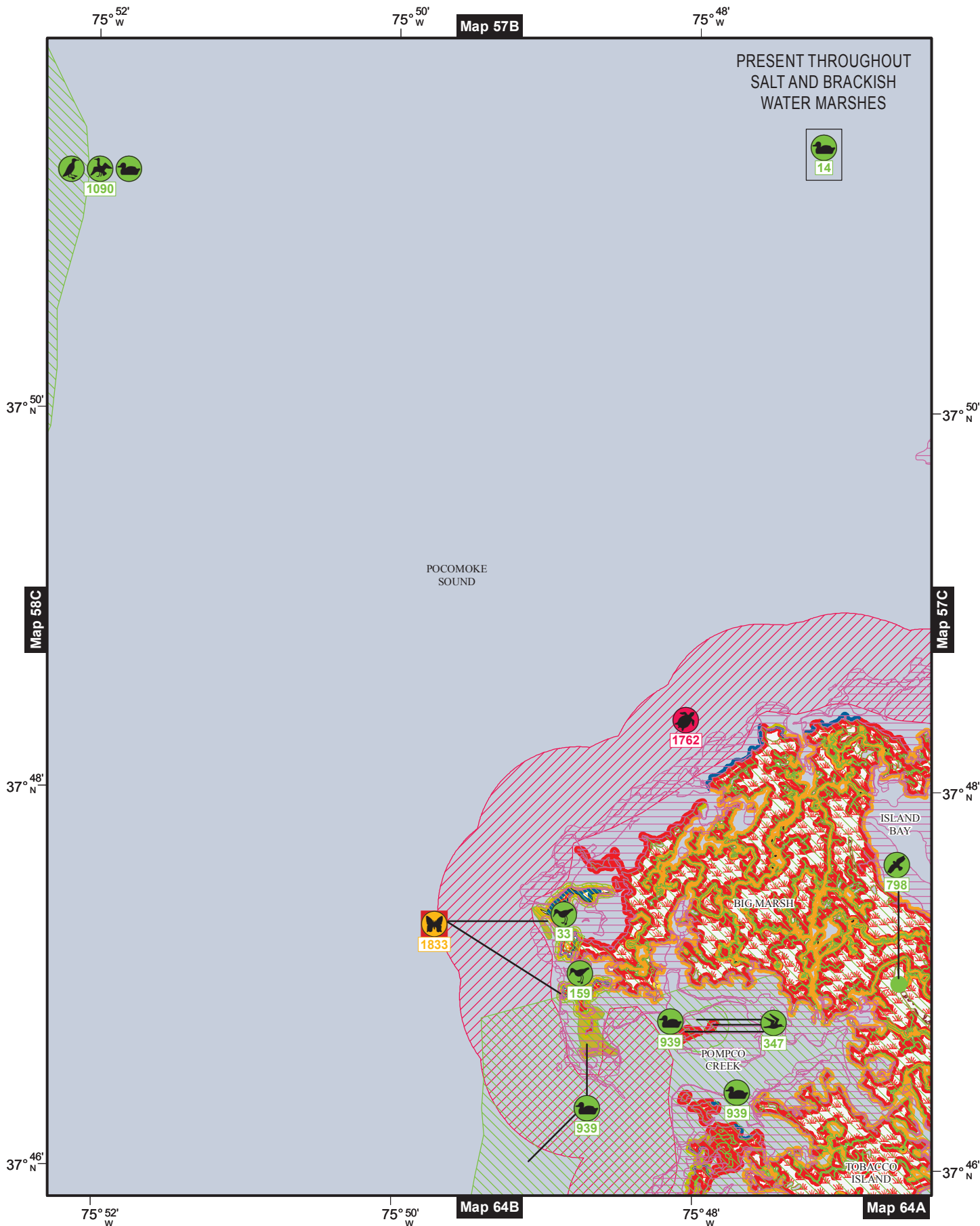
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	241,726.33	150.20	50%
10B	Freshwater Marshes	31.89	0.02	< 1%
10C	Swamps	11,134.94	6.92	2%
10D	Scrub and Shrub Wetlands	2,802.32	1.74	1%
9A	Sheltered Tidal Flats	185,960.90	115.55	39%
9B	Vegetated Low Banks	3,542.74	2.20	1%
8B	Sheltered, Solid Man-Made Structures	1,766.26	1.10	< 1%
8C	Sheltered Riprap	134.78	0.08	< 1%
7	Exposed Tidal Flats	13,799.66	8.57	3%
6B	Riprap	313.95	0.20	< 1%
5	Mixed Sand and Gravel Beaches	38.58	0.02	< 1%
3A	Fine to Medium Grained Sand Beaches	18,961.91	11.78	4%
1B	Exposed, Solid Man-Made Structures	57.71	0.04	< 1%

Total ESI Shoreline: 480,271.98 Total ESI Shoreline: 298.43
 Total Shoreline: 246,796.63 Total Shoreline: 153.35

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 57D
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 1 Miles
Not for Navigation
0 1 Kilometers

1:50,000



Map 57D
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral													-	-	-	-
SAV	Submerged aquatic veg	High Ecological Value			High													-	-	-	-
SAV	Submerged aquatic veg	High Ecological Value			Low													-	-	-	-

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
14	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
		American black duck	Wintering			100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
33	Shorebird	American oystercatcher	Nesting			1 Pair													Apr-Aug	-	-	-
159	Shorebird	American oystercatcher	Nesting			2 Pairs													Apr-Aug	-	-	-
347	Gull/Tern	Forster's tern	Nesting			228 Pairs													May-Jul	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest													Dec-Jun	-	-	-
939	Waterfowl	Blue-winged teal	Migration			10S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canvasback	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-
1090	Diving	Common loon	Wintering			100S													-	-	-	-
	Diving	D. crested cormorant	Migration			1,000S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering			100S													-	-	-	-
	Pelagic	Northern gannet	Wintering			100S													-	-	-	-
	Waterfowl	Scoters	Wintering			10,000S													-	-	-	-




REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1762	Turtle	Diamondback terrapin	Concentration Area			High													May-Aug	-	-	Apr-Oct	Apr-Oct


INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E	T	-													Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Common loon	Wintering			Present													-	-	-	-
	Grebes	Wintering			10S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Northern gannet	Wintering			Present													-	-	-	-
	American black duck	Wintering			1,000S													-	-	-	-
	American wigeon	Wintering			1,000S													-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-
	Blue-winged teal	Migration			1,000S													-	Feb-Apr	Aug-Oct	-
	Brant	Wintering			10S													-	-	-	-
	Bufflehead	Wintering			1,000S													-	-	-	-
	Canada goose	Wintering			1,000S													-	-	-	-
	Canvasback	Wintering			1,000S													-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-
	Gadwall	Wintering			100S													-	-	-	-
	Green-winged teal	Wintering			1,000S													-	-	-	-
	Long-tailed duck	Wintering			100S													-	-	-	-
	Mallard	Wintering			1,000S													-	-	-	-
	Mergansers	Wintering			100S													-	-	-	-
	Northern pintail	Wintering			10S													-	-	-	-
	Northern shoveler	Wintering			Present													-	-	-	-
	Redhead	Wintering			1,000S													-	-	-	-
	Redhead	Wintering			10,000S													-	-	-	-
	Ring-necked duck	Wintering			Present													-	-	-	-
	Ruddy duck	Wintering			10,000S													-	-	-	-
	Scaup	Wintering			100S													-	-	-	-
	Scaup	Wintering			1,000S													-	-	-	-
	Scoters	Wintering			1,000S													-	-	-	-
	Snow goose	Wintering			100S													-	-	-	-
	Tundra swan	Wintering			100S													-	-	-	-


FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-													-	-	-	-	Feb-Jun



REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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	Green sea turtle	General Distribution	T/T	T	Common													-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

INVERTEBRATES




<div></div>	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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	Crab	Blue crab	Concentration Area			Highly Abundant-Summ																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															</

MARINE MAMMALS



	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt	
				S	F	Concentration	J F M A M J J A S O N D															
							J	F	M	A	M	J	J	A	S	O	N					D
	Manatee	West Indian manatee	General Distribution	-/E	E	Rare														-	-	
	Whale	Humpback whale	General Distribution	E/E	E	Very Rare														-	-	

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS






Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican														-	-	-
	Brown pelican														-	-	-
	D. crested cormorant														-	-	-
	D. crested cormorant														-	-	-
	Gulls														-	-	-
	Terns														-	-	-
	Saltmarsh sharp-tailed sparrow													May-Aug	-	-	-
	Seaside sparrow													May-Jul	-	-	-
	Willet													May-Jul	-	-	-
	Clapper rail													Apr-Sep	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J F M A M J J A S O N D																
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	Alewife													-	-	-	Jan-May	Jan-Dec
	American eel																	
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	Mar-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov

Central Bay: Map 57D





FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep


REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diamondback terrapin													May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Eastern oyster													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,500.28	2.34
10D	Scrub and Shrub Wetlands	7.38	0.01
9A	Sheltered Tidal Flats	7.06	0.01
7	Exposed Tidal Flats	50.26	0.08

ESI SHORELINE HABITAT TYPES

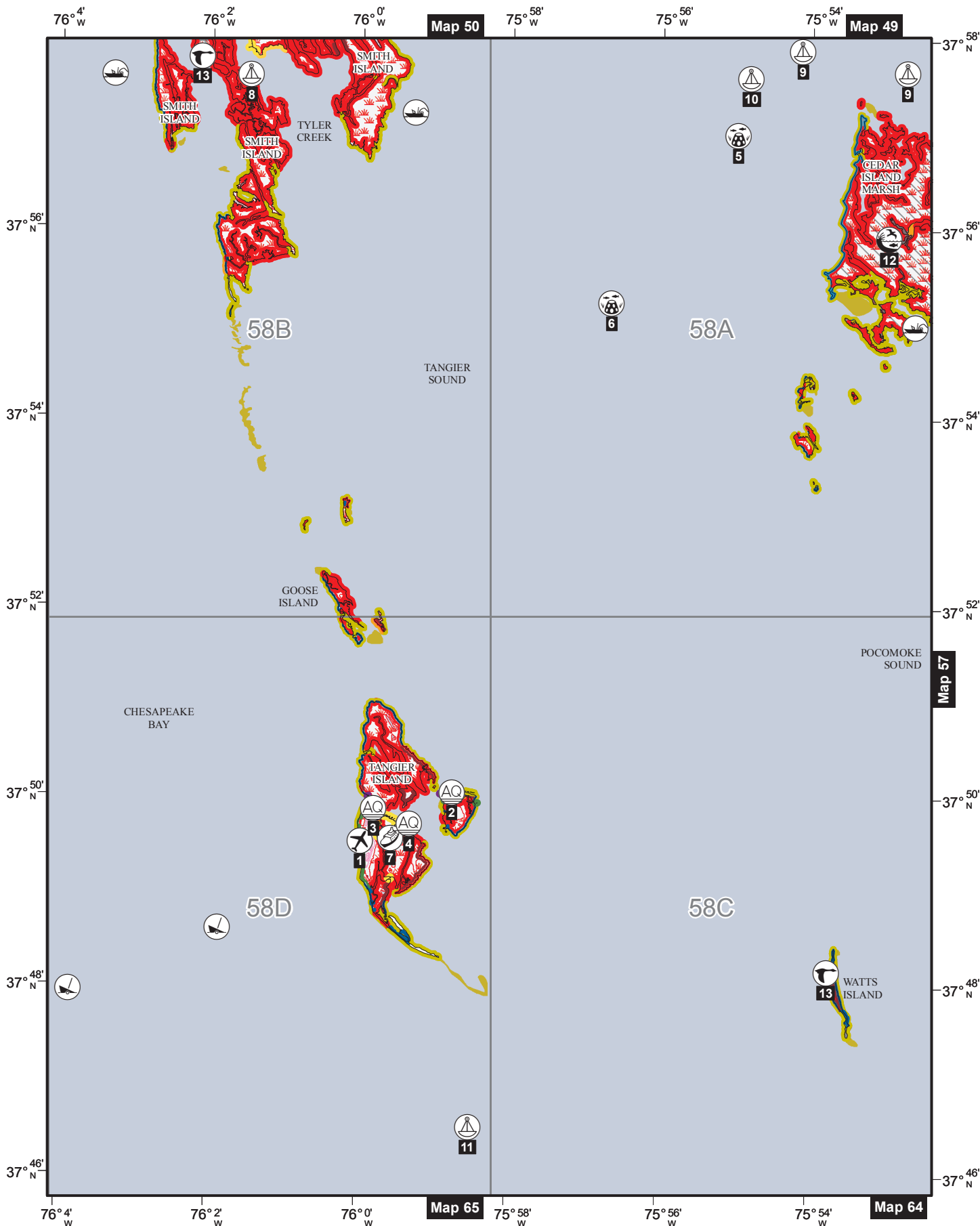
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	145,091.13	90.16	51%
9A	Sheltered Tidal Flats	125,007.18	77.68	44%
8B	Sheltered, Solid Man-Made Structures	12.08	0.01	< 1%
7	Exposed Tidal Flats	7,589.42	4.72	3%
3A	Fine to Medium Grained Sand Beaches	7,353.61	4.57	3%

Total ESI Shoreline: 285,053.41
Total Shoreline: 147,010.39
Total ESI Shoreline: 177.12
Total Shoreline: 91.35

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 58 Central Bay



SEE BACK OF MAP
for details about mapped resources and
other resources that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 2 Miles
0 2 Kilometers

1:100,000



Map 58
Central Bay

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	AIRPORT	TANGIER ISLAND		
2	AQUACULTURE	OYSTER NON-COMM CHES BAY FOUNDATION RF#98-1675	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
3	AQUACULTURE	OYSTER NON-COMM PARKS RF#98-1825	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
4	AQUACULTURE	OYSTER NON-COMM THOMAS RF#99-0915	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	ARTIFICIAL REEF	JANE'S ISLAND		
6	ARTIFICIAL REEF	TANGIER SOUND		
7	FERRY	TANGIER FERRY		
8	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, CHESAPEAKE BAY	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
9	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, LITTLE ANNEMESSEX	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
10	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, TANGIER SOUND	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
11	REPEATED MEASUREMENT SITE	WQ - STATION CB7.1N	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
12	MANAGEMENT AREA	CEDAR ISLAND WMA	WILDLIFE AND HERITAGE SERVICE	
13	WILDLIFE REFUGE	MARTIN NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE	410-228-2692

ALSO PRESENT IN MAPPED AREA (POLYGONS)				
Type	Name	Contact	Phone	
STATE PROTECTED AREA	BLUE CRAB SANCTUARY	VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200	
STATE PROTECTED AREA	TIDAL LANDS	VA MARINE RESOURCES COMMISSION		

JURISDICTIONS

COUNTY: ACCOMACK COUNTY, SOMERSET COUNTY
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT, NORFOLK DISTRICT

FEMA:
EPA:

REGION I
 REGION 3

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	3,187.33	4.98
10B	Freshwater Marshes	15.57	0.02
10D	Scrub and Shrub Wetlands	25.51	0.04
9A	Sheltered Tidal Flats	3.93	0.01
7	Exposed Tidal Flats	278.14	0.43



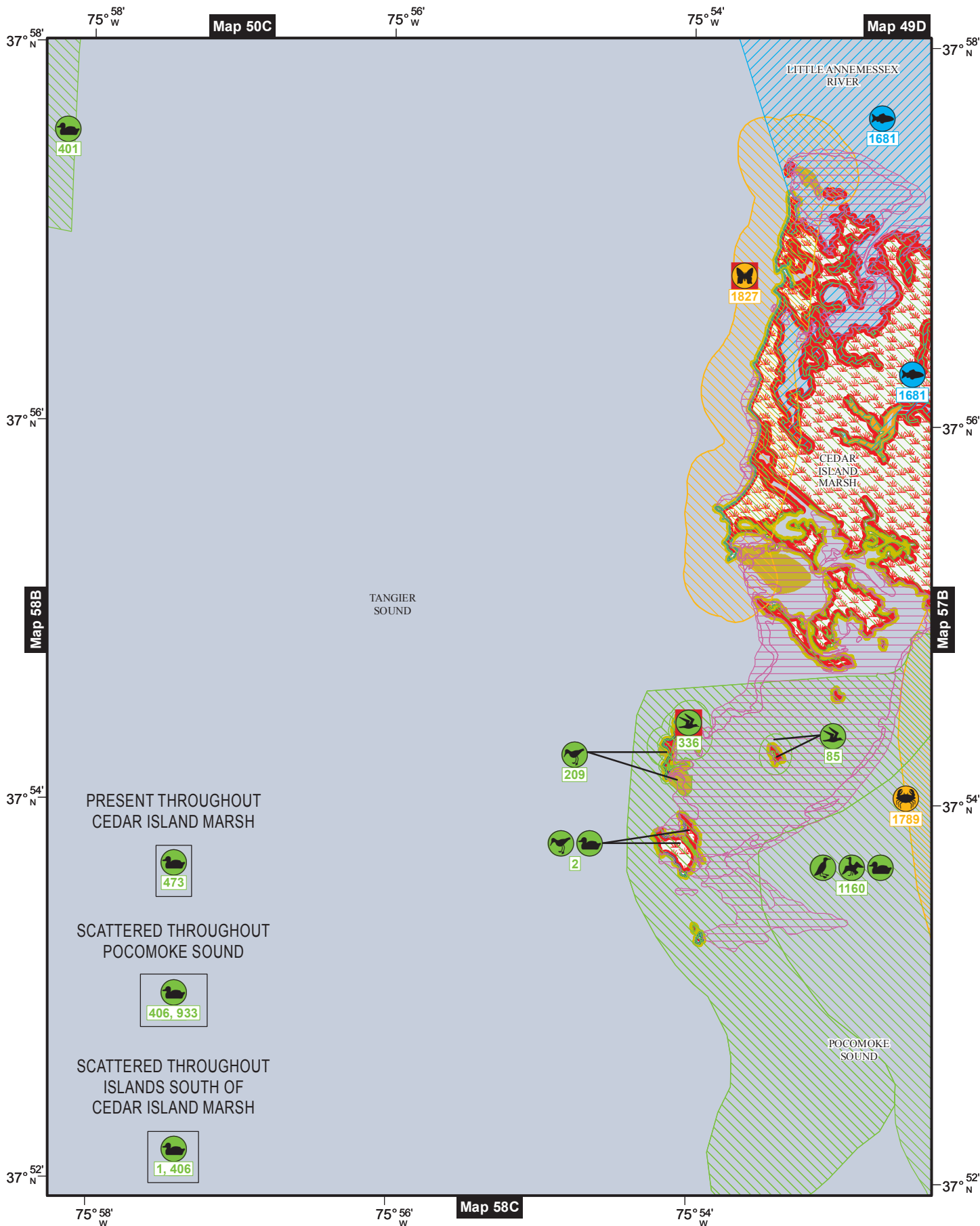
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	202,840.79	126.04	59%
10D	Scrub and Shrub Wetlands	7,281.05	4.52	2%
9A	Sheltered Tidal Flats	5,568.01	3.46	2%
9B	Vegetated Low Banks	39.31	0.02	< 1%
8B	Sheltered, Solid Man-Made Structures	2,734.48	1.70	1%
8C	Sheltered Riprap	922.97	0.57	< 1%
7	Exposed Tidal Flats	88,331.47	54.89	26%
6A	Gravel Beaches	191.27	0.12	< 1%
6B	Riprap	2,725.85	1.69	1%
4	Coarse Grained Sand Beaches	5,655.39	3.51	2%
3A	Fine to Medium Grained Sand Beaches	27,231.82	16.92	8%
1B	Exposed, Solid Man-Made Structures	278.93	0.17	< 1%
Total ESI Shoreline:		343,801.34	213.63	
Total Shoreline:		215,616.07	133.98	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 58A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		High												
SAV	Submerged aquatic veg	High Ecological Value		Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
1	Waterfowl	American black duck	Nesting		Present												
	Waterfowl	Canada goose	Nesting		Present												
	Waterfowl	Mallard	Nesting		Present												
2	Shorebird	American oystercatcher	Nesting		2 Pairs												
	Waterfowl	American black duck	Nesting		Present												
	Waterfowl	Canada goose	Nesting		Present												
	Waterfowl	Mallard	Nesting		Present												
85	Gull/Tern	Forster's tern	Nesting		302 Pairs												
	Gull/Tern	Laughing gull	Nesting		607 Pairs												
209	Shorebird	American oystercatcher	Nesting		-												
	Gull/Tern	Black skimmer	Nesting	E/-	70 Pairs												
336	Gull/Tern	Common tern	Nesting		40 Pairs												
	Gull/Tern	Forster's tern	Nesting		60 Pairs												
	Gull/Tern	G. black-backed gull	Nesting		13 Pairs												
	Gull/Tern	Laughing gull	Nesting		87 Pairs												
	Gull/Tern	Royal tern	Nesting	E/-	40 Pairs												
	Waterfowl	Brant	Wintering		100S												
	Waterfowl	Canada goose	Wintering		1,000S												
	Waterfowl	Canvasback	Wintering		100S												
	Waterfowl	Redhead	Wintering		10,000S												
	Waterfowl	Ruddy duck	Wintering		10S												
	Waterfowl	Scaup	Wintering		1,000S												
	Waterfowl	Tundra swan	Wintering		1,000S												
406	Waterfowl	American black duck	Wintering		100S												
	Waterfowl	American wigeon	Wintering		1,000S												
	Waterfowl	Blue-winged teal	Migration		100S												
	Waterfowl	Brant	Wintering		100S												
	Waterfowl	Canada goose	Wintering		1,000S												
	Waterfowl	Gadwall	Wintering		1,000S												
	Waterfowl	Green-winged teal	Wintering		100S												

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
473	Waterfowl	Mallard	Wintering			100S													-		-	-
	Waterfowl	Northern pintail	Wintering			100S													-		-	-
	Waterfowl	Tundra swan	Wintering			1,000S													-		-	-
	Waterfowl	American black duck	Nesting			Moderate-High												Mar-Aug				Jul-Aug
	Waterfowl	Canada goose	Nesting			Moderate-High												Mar-Jun				Jul-Aug
	Waterfowl	Wood duck	Nesting			Moderate-High												Mar-Jun				Jul-Aug
933	Waterfowl	Canvasback	Wintering			100S												-		-	-	-
	Waterfowl	Redhead	Wintering			1,000S												-		-	-	-
1160	Waterfowl	Ruddy duck	Wintering			100S												-		-	-	-
	Waterfowl	Scaup	Wintering			100S												-		-	-	-
	Diving	Common loon	Wintering			Present												-		-	-	-
	Diving	Grebes	Wintering			10S												-		-	-	-
	Pelagic	Northern gannet	Wintering			Present												-		-	-	-
	Waterfowl	Scoters	Wintering			1,000S												-		-	-	-

FISH




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
				S	F		J	F	M	A	M	J	J	A	S	O	N	D						
1681	Diadromous	Alewife	Nursery Area			-													-			Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-			May-Jul	May-Oct	Feb-Jun

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
				S	F		J	F	M	A	M	J	J	A	S	O	N	D						
1789	Crab	Blue crab	Concentration Area			Highly Abundant													-				Jun-Mar*	Jun-Mar*
1827	Insect	Federally threatened insect 1	Vulnerable Occurrence			-													Jun-Aug				Jun-Jul	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt	
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diving	Common loon	Wintering			100S													-			-	-
		D. crested cormorant	Migration			1,000S													-			-	-
		Grebes	Wintering			100S													-			-	-
	Pelagic	Red-throated loon	Wintering			100S													-			-	-
		Northern gannet	Wintering			100S													-			-	-
		American black duck	Wintering			1,000S													-			-	-
	Waterfowl	American coot	Wintering			10S													-			-	-
		American wigeon	Wintering			100S													-			-	-
		Bufflehead	Wintering			1,000S													-			-	-
		Bufflehead	Wintering			1,000S													-			-	-
		Canada goose	Wintering			100S													-			-	-
		Canvasback	Wintering			1,000S													-			-	-


BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
		Canvasback	Wintering			1,000S													-	-	-	-
		Common goldeneye	Wintering			10S													-	-	-	-
		Gadwall	Wintering			1,000S													-	-	-	-
		Green-winged teal	Wintering			1,000S													-	-	-	-
		Long-tailed duck	Wintering			100S													-	-	-	-
		Mallard	Wintering			1,000S													-	-	-	-
		Mergansers	Wintering			100S													-	-	-	-
		Mergansers	Wintering			100S													-	-	-	-
		Northern pintail	Wintering			10S													-	-	-	-
		Northern shoveler	Wintering			Present													-	-	-	-
		Redhead	Wintering			10,000S													-	-	-	-
		Redhead	Wintering			1,000S													-	-	-	-
		Ring-necked duck	Wintering			Present													-	-	-	-
		Ring-necked duck	Wintering			10S													-	-	-	-
		Ruddy duck	Wintering			1,000S													-	-	-	-
		Ruddy duck	Wintering			10,000S													-	-	-	-
		Scaup	Wintering			100S													-	-	-	-
		Scaup	Wintering			1,000S													-	-	-	-
		Sooters	Wintering			10,000S													-	-	-	-
		Snow goose	Wintering			1,000S													-	-	-	-
		Tundra swan	Wintering			100S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
 Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	Alewife	Migration			-													-	-	-	Aug-Nov	Mar-May
	American shad	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	American shad	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Atlantic sturgeon	General Distribution			-													-	-	-	Aug-Nov	Jan-Dec
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution			-													-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-													-	-	-	-	Mar-Jun
	Striped bass	Migration			-													-	-	-	-	Feb-Jun
	Striped bass	Migration			-													-	-	-	-	Feb-Jun
	Striped bass	Migration			-													-	-	-	-	Feb-Jun
	Striped bass	Migration			-													-	-	-	-	Feb-Jun



REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES





Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Blue crab	Concentration Area			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS




Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	
	Humpback whale	General Distribution	E/E	E	Very Rare													-	-	-	

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Saltmarsh sharp-tailed sparrow													May-Aug	-	-	-
	Seaside sparrow													May-Jul	-	-	-
	Willet													May-Jul	-	-	-
	Clapper rail													Apr-Sep	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov

Central Bay: Map 58A


FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	Mar-Oct	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	Mar-Oct	Apr-Nov
	Red drum													-	-	-	Mar-Oct	May-Nov
	Sheepshead													-	-	-	Mar-Oct	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Bivalve	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
Cephalopod	Squid													-	-	-	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
Shrimp	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,131.59	1.77
9A	Sheltered Tidal Flats	1.15	0.00
7	Exposed Tidal Flats	88.89	0.14

ESI SHORELINE HABITAT TYPES

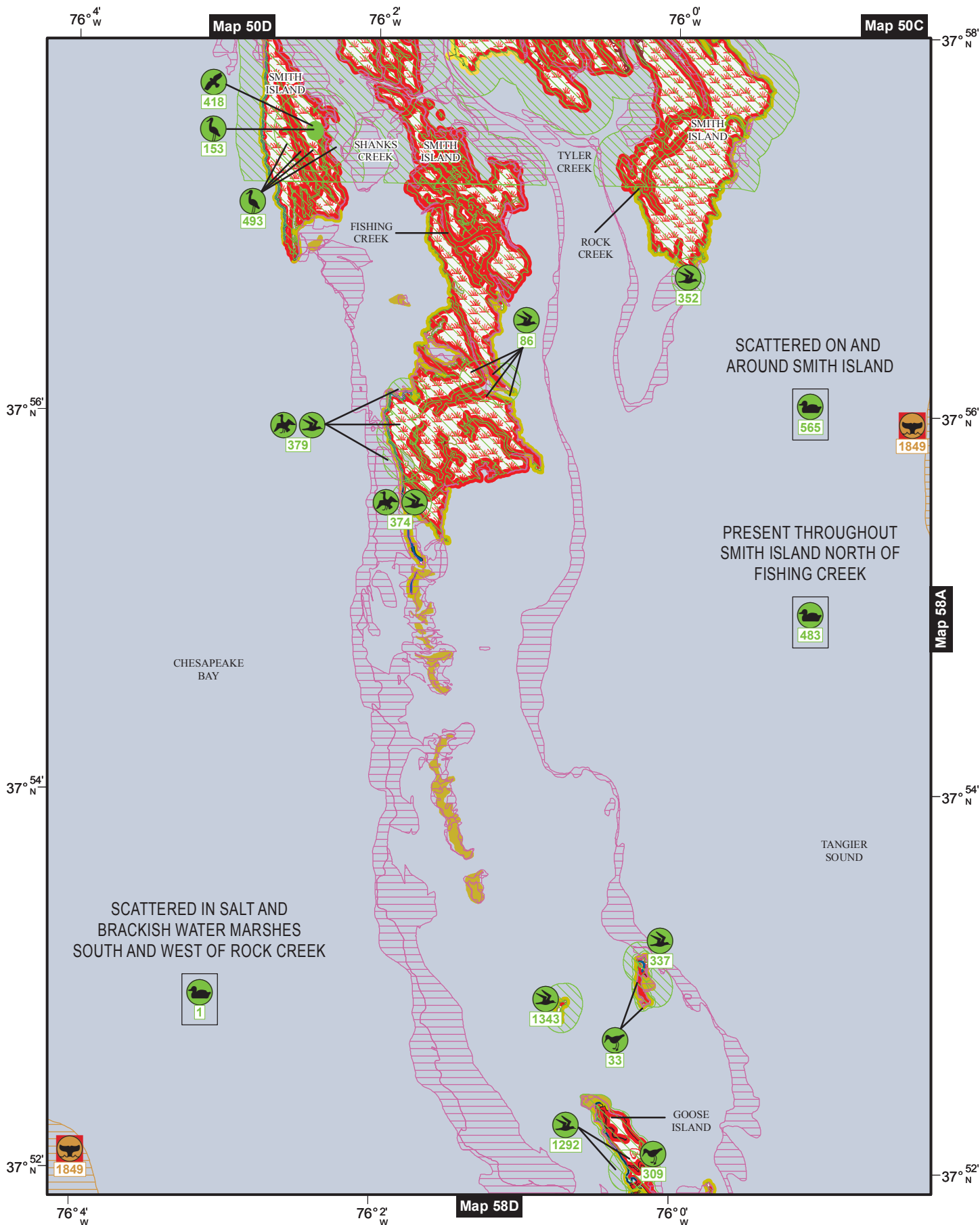
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	61,245.89	38.06	58%
9A	Sheltered Tidal Flats	3,897.07	2.42	4%
7	Exposed Tidal Flats	32,495.58	20.19	31%
4	Coarse Grained Sand Beaches	5,655.39	3.51	5%
3A	Fine to Medium Grained Sand Beaches	3,214.71	2.00	3%

Total ESI Shoreline: 106,508.65 Total ESI Shoreline: 66.18
Total Shoreline: 61,669.16 Total Shoreline: 38.32

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 58B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA	Monthly Presence																	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
SAV	Submerged aquatic veg	High Ecological Value				Ephemeral													-	-	-
SAV	Submerged aquatic veg	High Ecological Value				Low													-	-	-

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
1	Waterfowl	American black duck	Nesting				Present													Apr-Jul	-	-	-
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
33	Shorebird	American oystercatcher	Nesting				1 Pair													Apr-Aug	-	-	-
86	Gull/Tern	G. black-backed gull	Nesting				22 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting				26 Pairs													May-Aug	-	-	-
153	Wading	Great blue heron	Nesting				4 Nests													Feb-Jun	-	-	-
309	Shorebird	American oystercatcher	Nesting				12 Pairs													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Roosting				3 Pairs													Apr-Aug	-	-	-
337	Gull/Tern	Common tern	Nesting				1 Pair													May-Aug	-	-	-
	Gull/Tern	Forster's tern	Nesting				6 Pairs													May-Jul	-	-	-
	Gull/Tern	G. black-backed gull	Nesting				27 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting				4 Pairs													May-Aug	-	-	-
352	Gull/Tern	G. black-backed gull	Nesting				5 Pairs													Apr-Jun	-	-	-
374	Diving	Brown pelican	Nesting				1128 Pairs													Apr-Aug	-	-	-
	Diving	D. crested cormorant	Nesting				1026 Pairs													May-Aug	-	-	-
	Gull/Tern	G. black-backed gull	Nesting				3 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting				7 Pairs													May-Aug	-	-	-
379	Diving	Brown pelican	Nesting				729 Pairs													Apr-Aug	-	-	-
	Diving	D. crested cormorant	Nesting				1343 Pairs													May-Aug	-	-	-
	Gull/Tern	G. black-backed gull	Nesting				80 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting				15 Pairs													May-Aug	-	-	-
418	Raptor	Bald eagle	Nesting				Last Obs. 2004													Feb-Apr	-	-	-
483	Waterfowl	American black duck	Nesting				Very High													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Nesting				Moderate-High													Mar-Aug	-	-	Jul-Aug
493	Wading	Great blue heron	Nesting				4 Pairs													Feb-Jun	-	-	-
565	Waterfowl	American black duck	Wintering				1,000S													-	-	-	-
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Calving	Pupping	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Waterfowl	Northern pintail	Wintering			100S												-			-
1292	Gull/Tern	Herring gull	Nesting			2 Pairs												May-Aug			-
1343	Gull/Tern	Common tern	Nesting			71 Pairs												May-Aug			-
	Gull/Tern	Forster's tern	Nesting			642 Pairs												May-Jul			-
	Gull/Tern	G. black-backed gull	Nesting			19 Pairs												Apr-Jun			-

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
1849	Whale	Humpback whale	General Distribution	E/E	E	Very Rare												-			-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Calving	Pupping	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
SAV	Submerged aquatic veg	High Ecological Value			High												-			-


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Calving	Pupping	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
Diving	Common loon	Wintering			100S												-			-
	Common loon	Wintering			100S												-			-
	D. crested cormorant	Migration			1,000S												-	Mar-May	Aug-Nov	-
	D. crested cormorant	Wintering			1,000S												-	Mar-May	Aug-Nov	-
	Grebes	Wintering			100S												-			-
	Grebes	Wintering			100S												-			-
	Red-throated loon	Wintering			100S												-			-
Pelagic	Northern gannet	Wintering			100S												-			-
	American black duck	Wintering			100S												-			-
Waterfowl	American wigeon	Wintering			1,000S												-			-
	Blue-winged teal	Migration			100S												-	Feb-Apr	Aug-Oct	-
	Brant	Wintering			100S												-			-
	Brant	Wintering			1,000S												-			-
	Bufflehead	Wintering			1,000S												-			-
	Bufflehead	Wintering			1,000S												-			-
	Canada goose	Wintering			1,000S												-			-
	Canvasback	Wintering			100S												-			-
	Canvasback	Wintering			1,000S												-			-
	Canvasback	Wintering			100S												-			-
	Common goldeneye	Wintering			10S												-			-
	Gadwall	Wintering			1,000S												-			-
	Green-winged teal	Wintering			100S												-			-
	Long-tailed duck	Wintering			100S												-			-


BIRDS (continued)

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
	Mallard	Wintering			100S													-	-	-
	Mergansers	Wintering			100S													-	-	-
	Mergansers	Wintering			100S													-	-	-
	Northern pintail	Wintering			100S													-	-	-
	Redhead	Wintering			1,000S													-	-	-
	Redhead	Wintering			10,000S													-	-	-
	Redhead	Wintering			10,000S													-	-	-
	Ring-necked duck	Wintering			10S													-	-	-
	Ring-necked duck	Wintering			Present													-	-	-
	Ruddy duck	Wintering			100S													-	-	-
	Ruddy duck	Wintering			10S													-	-	-
	Ruddy duck	Wintering			10,000S													-	-	-
	Scaup	Wintering			1,000S													-	-	-
	Scaup	Wintering			100S													-	-	-
	Scaup	Wintering			1,000S													-	-	-
	Scoters	Wintering			10,000S													-	-	-
	Tundra swan	Wintering			1,000S													-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife	Migration			-													-	-	-	Aug-Nov	Mar-May
	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	American shad	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Atlantic sturgeon	General Distribution			-/E													-	-	-	-	Jan-Dec
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution			E/E													-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-													-	-	-	-	Feb-Jun
	Striped bass	Migration			-													-	-	-	-	Mar-Jun

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	K. ridley sea turtle	General Distribution			Uncommon													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution			Common													-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution			Abundant													-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution			Common													-	-	-	Nov-Dec	Nov-Dec

INVERTEBRATES

	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
				S	F	Concentration	Highly Abundant-Summ	J	F	M	A	M	J	J	A	S	O						N	D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	Crab	Blue crab	Concentration Area																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	</

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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 Manatee	West Indian manatee	General Distribution	-	E	Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS




Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		-	J	F	M	A	M	J	J	A	S	O	N	D			
Diving	Brown pelican																	-	-	-	-
	Brown pelican																	-	-	-	-
	D. crested cormorant																	-	-	-	-
Gull/Tern	D. crested cormorant																	-	-	-	-
	Gulls																	-	-	-	-
	Terns																	-	-	-	-
Pelagic	Storm-petrels																	-	-	-	-

FISH





Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		-	J	F	M	A	M	J	J	A	S	O	N	D				
Diadromous	American eel																	-	-	-	Jan-May	Jan-Dec
	Gizzard shad																	Mar-Jun	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Striped bass																	-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker																	-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden																	-	-	-	Jan-Dec	Jan-Dec
	Black drum																	Apr-Jun	-	-	Apr-Dec	Apr-Nov
	Black sea bass																	-	-	-	Apr-Nov	Apr-Nov
	Bluefish																	-	-	-	May-Oct	May-Oct
	Kingfishes																	-	-	-	-	Apr-Nov
	Northern puffer																	-	-	-	Mar-Oct	Mar-Nov
	Pigfish																	-	-	-	-	Apr-Nov
	Red drum																	-	-	-	-	May-Nov
	Sheepshead																	-	-	-	-	Apr-Nov
	Spot																	-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout																	May-Jul	-	-	Apr-Nov	Apr-Nov
	Spotted seatrout																	-	-	-	Aug-Dec	Apr-Dec
	Summer flounder																	-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish																	-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch																	-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Winter flounder																	-	-	-	-	Dec-Mar
	Pipefish																	-	-	-	Jan-Dec	Jan-Dec

Central Bay: Map 58B


FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	May-Oct	Jan-Dec
	Striped burrfish													-	-	-	-	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	Apr-Dec	Apr-Dec	Jan-Dec	Apr-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-
														-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	1,414.33	2.21
10D	Scrub and Shrub Wetlands	10.24	0.02
7	Exposed Tidal Flats	95.32	0.15



ESI SHORELINE HABITAT TYPES

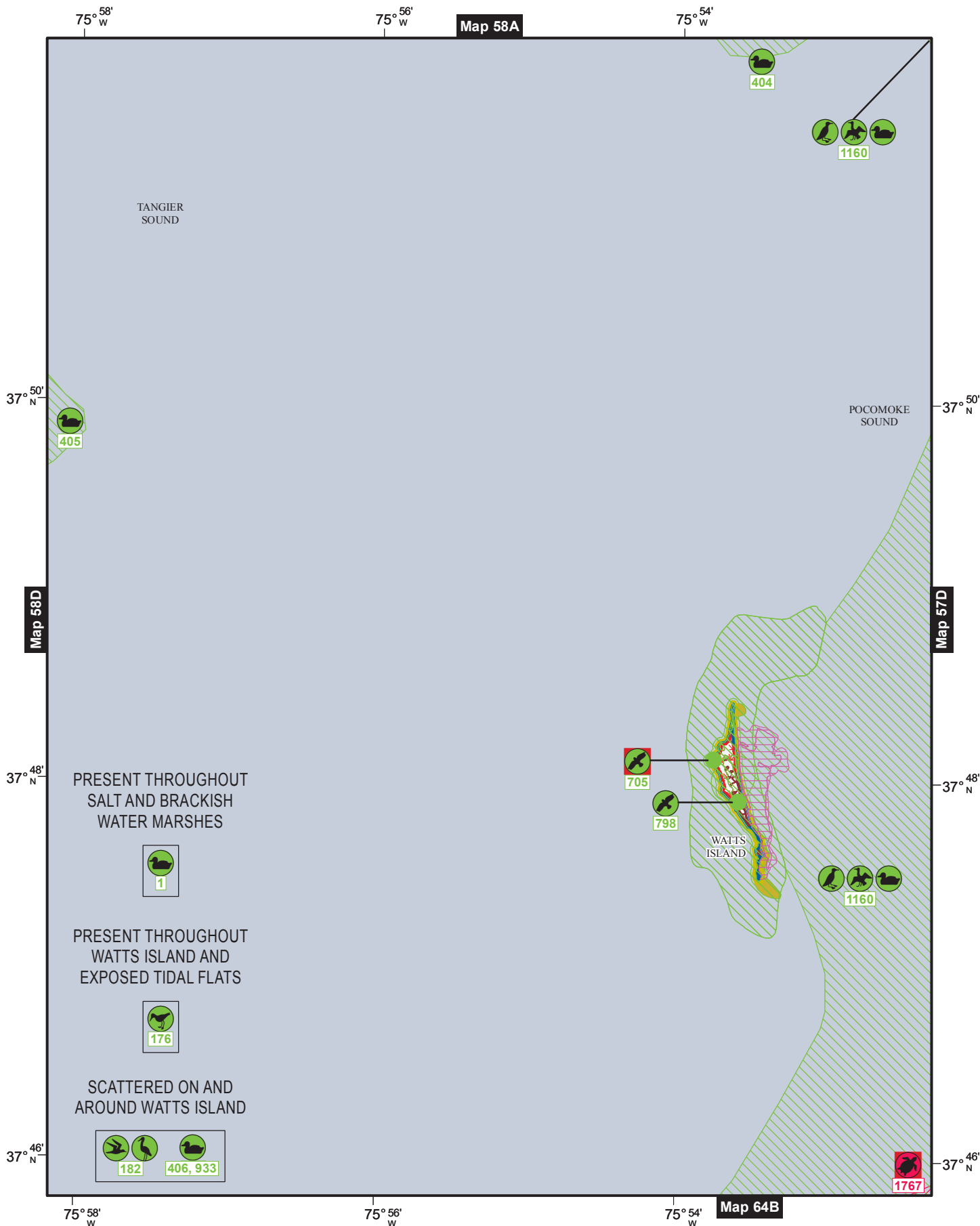
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	96,871.88	60.19	71%
10D	Scrub and Shrub Wetlands	558.72	0.35	< 1%
9A	Sheltered Tidal Flats	346.65	0.22	< 1%
8B	Sheltered, Solid Man-Made Structures	472.44	0.29	< 1%
8C	Sheltered Riprap	852.07	0.53	1%
7	Exposed Tidal Flats	30,170.27	18.75	22%
6A	Gravel Beaches	191.27	0.12	< 1%
3A	Fine to Medium Grained Sand Beaches	7,545.21	4.69	6%

Total ESI Shoreline: 137,008.51 Total ESI Shoreline: 85.13
 Total Shoreline: 98,703.35 Total Shoreline: 61.33

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

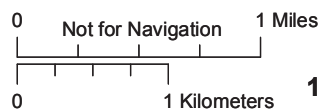




Map 58C
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



1:50,000

Map 58C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence											
							J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value				Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value				Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence										Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O				
1	Waterfowl	American black duck	Nesting				Present											Apr-Jul	-	-	-
	Waterfowl	Canada goose	Nesting				Present											Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present											Mar-Aug	-	-	Jul-Aug
	176 Shorebird	American oystercatcher	Nesting				8 Pairs											Apr-Aug	-	-	-
	182 Gull/Tern	G. black-backed gull	Nesting				13 Pairs											Apr-Jun	-	-	-
	Wading	BC night-heron	Nesting				57 Pairs											Apr-Aug	-	-	-
	Wading	Cattle egret	Nesting				8 Pairs											May-Aug	-	-	-
	Wading	Glossy ibis	Nesting				74 Pairs											May-Jul	-	-	-
	Wading	Great blue heron	Nesting				25 Nests											Feb-Jun	-	-	-
	Wading	Great egret	Nesting				69 Nests											Apr-Aug	-	-	-
	Wading	Snowy egret	Nesting				50 Pairs											Apr-Aug	-	-	-
	Wading	Tricolored heron	Nesting				21 Pairs											May-Aug	-	-	-
	Wading	YC night-heron	Nesting				2 Pairs											Apr-Jul	-	-	-
	404 Waterfowl	American black duck	Wintering				100S											-	-	-	-
	Waterfowl	American wigeon	Wintering				1,000S											-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S											-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				100S											-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S											-	-	-	-
	Waterfowl	Canvasback	Wintering				100S											-	-	-	-
	Waterfowl	Gadwall	Wintering				1,000S											-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S											-	-	-	-
	Waterfowl	Mallard	Wintering				100S											-	-	-	-
	Waterfowl	Northern pintail	Wintering				100S											-	-	-	-
	Waterfowl	Redhead	Wintering				1,000S											-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S											-	-	-	-
	Waterfowl	Scaup	Wintering				100S											-	-	-	-
	Waterfowl	Tundra swan	Wintering				1,000S											-	-	-	-
	405 Waterfowl	American black duck	Wintering				100S											-	-	-	-
	Waterfowl	American wigeon	Wintering				1,000S											-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S											-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				1,000S											-	-	-	-




BIRDS (continued)

[illegible]

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MDVA			Monthly Presence												Hatch	Internet	Juveniles	Adults
				S	F	T	J	F	M	A	M	J	J	A	S	O	N	D				
1767	Turtle	Green sea turtle	General Distribution	T/T			Rare												-	-	May-Dec*	-
	Turtle	Green sea turtle	General Distribution	T/T			Common												-	-	Jul-Oct	-


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			100S													-	-	-	-
		D. crested cormorant			1,000S													-	Mar-May	Aug-Nov	-
		Grebes			100S													-	-	-	-
		Red-throated loon			100S													-	-	-	-
	Pelagic	Northern gannet			100S													-	-	-	-
		Bufflehead			1,000S													-	-	-	-
	Waterfowl	Canvasback			1,000S													-	-	-	-
		Long-tailed duck			100S													-	-	-	-
		Mergansers			100S													-	-	-	-
		Redhead			10,000S													-	-	-	-
		Ring-necked duck			Present													-	-	-	-
		Ruddy duck			10,000S													-	-	-	-
		Scaup			1,000S													-	-	-	-
		Scoters			10,000S													-	-	-	-
																		-	-	-	-
																		-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Alewife			-													-	-	-	Aug-Nov	Feb-Apr
		American shad			-													-	-	-	Aug-Nov	Feb-Jun
		Atlantic sturgeon			-/E													-	-	-	-	Jan-Dec
		Blueback herring			-													-	-	-	Aug-Nov	Mar-Jun
		Hickory shad			-													-	-	-	Jun-Sep	Feb-May
		Shortnose sturgeon			E/E													-	-	-	Jan-Dec	Jan-Dec
		Striped bass			-													-	-	-	-	Feb-Jun

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle	K. ridley sea turtle			Uncommon													-	-	-	Nov-Dec	-
		K. ridley sea turtle			Common													-	-	-	Apr-Oct	-
		Loggerhead sea turtle			Common													-	-	-	Nov-Dec	Nov-Dec
		Loggerhead sea turtle			Abundant													-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Crab	Blue crab			Highly Abundant													-	-	-	Jun-Oct	Jun-Oct
		Concentration Area																-	-	-	-	-

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
Manatee	West Indian manatee	General Distribution	-/E	E	Rare												-	-	-	-
Whale	Humpback whale	General Distribution	E/E	E	Very Rare												-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	-	-	-
Gull/Tern	Gulls													-	-	-	-
	Terns													-	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
Estuarine Nursery	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
Marine Benthic	Atlantic spadefish													-	-	-	-	Jun-Sep
	Clearnose skate													-	-	-	-	Jan-Dec

Central Bay: Map 58C

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	Apr-Dec	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	19.50	0.03
10D	Scrub and Shrub Wetlands	13.02	0.02
7	Exposed Tidal Flats	23.79	0.04



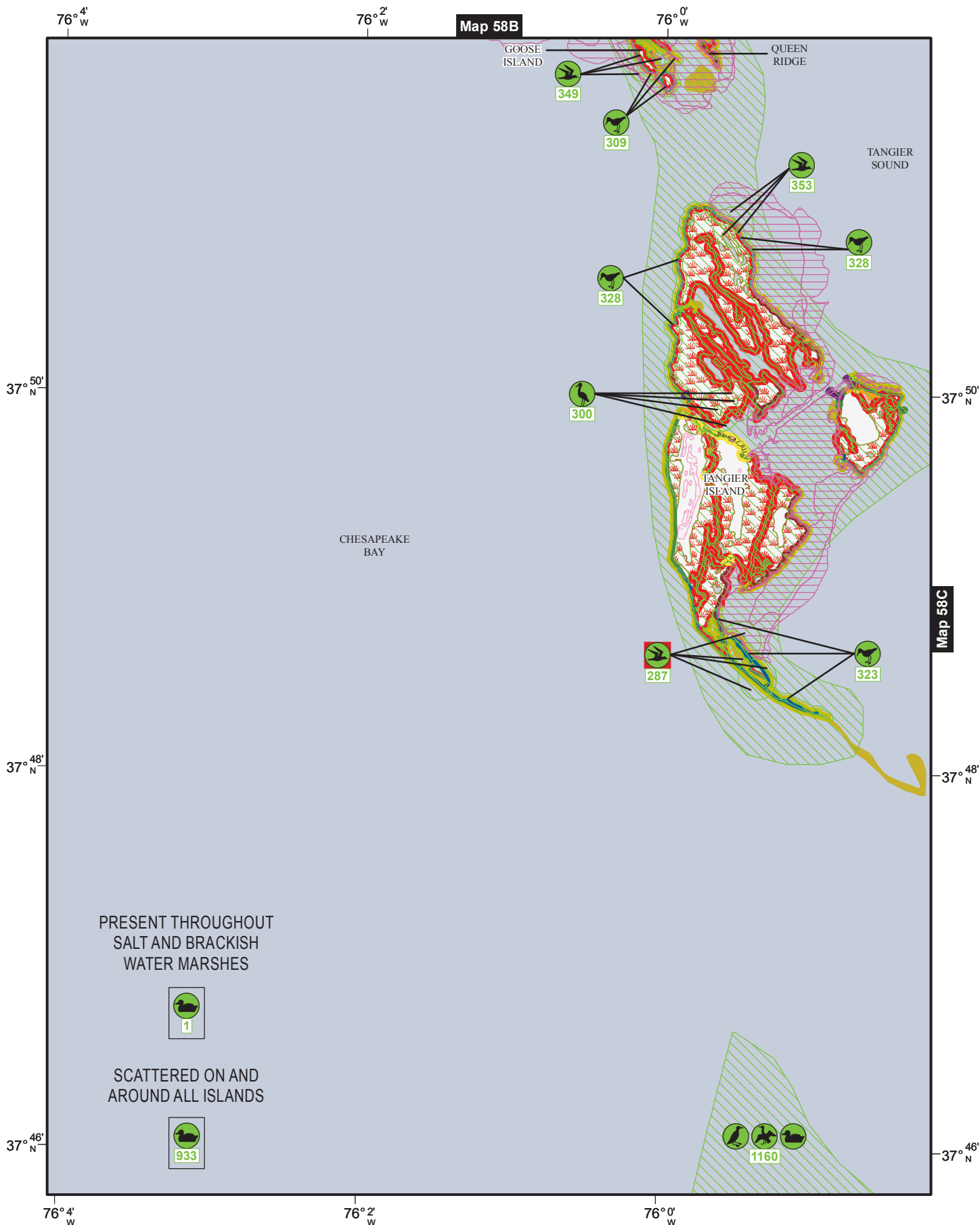
ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	1,831.53	1.14	17%
10D	Scrub and Shrub Wetlands	1,034.19	0.64	10%
7	Exposed Tidal Flats	3,946.67	2.45	37%
3A	Fine to Medium Grained Sand Beaches	3,946.67	2.45	37%
Total ESI Shoreline:		10,759.06	Total ESI Shoreline: 6.69	
		Total Shoreline:	Total Shoreline: 2.45	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 58D
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 1 Miles
Not for Navigation
0 1 Kilometers

1:50,000



Map 58D
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP




BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence											
							J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value				Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value				High												
SAV	Submerged aquatic veg	High Ecological Value				Low												


BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence											
								J	F	M	A	M	J	J	A	S	O	N	D
1	Waterfowl	American black duck	Nesting				Present												
	Waterfowl	Canada goose	Nesting				Present												
	Waterfowl	Mallard	Nesting				Present												
287	Gull/Tern	Black skimmer	Nesting	E/-			56 Pairs												
	Gull/Tern	Common tern	Nesting				17 Pairs												
	Gull/Tern	Herring gull	Nesting				9 Pairs												
	Gull/Tern	Royal tern	Nesting	E/-			16 Pairs												
300	Wading	BC night-heron	Nesting				24 Pairs												
	Wading	Glossy ibis	Nesting				26 Pairs												
	Wading	Great egret	Nesting				9 Nests												
	Wading	Little blue heron	Nesting				28 Pairs												
	Wading	Snowy egret	Nesting				34 Pairs												
	Wading	Tricolored heron	Nesting				8 Pairs												
	Wading	YC night-heron	Nesting				7 Pairs												
309	Shorebird	American oystercatcher	Nesting				12 Pairs												
	Shorebird	American oystercatcher	Roosting				3 Pairs												
323	Shorebird	American oystercatcher	Nesting				7 Pairs												
328	Shorebird	American oystercatcher	Nesting				13 Pairs												
	Shorebird	American oystercatcher	Roosting				2 Pairs												
349	Gull/Tern	G. black-backed gull	Nesting				16 Pairs												
353	Gull/Tern	G. black-backed gull	Nesting				5 Pairs												
	Gull/Tern	Herring gull	Nesting				12 Pairs												
933	Waterfowl	Canvasback	Wintering				100S												
	Waterfowl	Redhead	Wintering				1,000S												
	Waterfowl	Ruddy duck	Wintering				100S												
	Waterfowl	Scaup	Wintering				100S												
1160	Diving	Common loon	Wintering				Present												
	Diving	Grebes	Wintering				10S												
	Pelagic	Northern gannet	Wintering				Present												
	Waterfowl	Scoters	Wintering				1,000S												


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Common loon	Wintering			100S													-	-	-	-
	Common loon	Wintering			100S													-	-	-	-
	D. crested cormorant	Migration			1,000S													-	Mar-May	Aug-Nov	-
	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			100S													-	-	-	-
	Grebes	Wintering			100S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Northern gannet	Wintering			100S													-	-	-	-
	American black duck	Wintering			100S													-	-	-	-
	American wigeon	Wintering			1,000S													-	-	-	-
	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Brant	Wintering			1,000S													-	-	-	-
	Bufflehead	Wintering			1,000S													-	-	-	-
	Canada goose	Wintering			1,000S													-	-	-	-
	Canvasback	Wintering			1,000S													-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-
	Green-winged teal	Wintering			100S													-	-	-	-
	Long-tailed duck	Wintering			100S													-	-	-	-
	Mallard	Wintering			100S													-	-	-	-
	Mergansers	Wintering			100S													-	-	-	-
	Northern pintail	Wintering			100S													-	-	-	-
	Redhead	Wintering			10,000S													-	-	-	-
	Ring-necked duck	Wintering			Present													-	-	-	-
	Ruddy duck	Wintering			10,000S													-	-	-	-
	Scaup	Wintering			1,000S													-	-	-	-
	Scoters	Wintering			10,000S													-	-	-	-
	Tundra swan	Wintering			1,000S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-													-	-	-	-	Feb-Jun

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES




Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Blue crab	Concentration Area			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS





Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt	
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D
	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	-
	Humpback whale	General Distribution	E/E	E	Very Rare													-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)





BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Storm-petrels													-	-	-	-





FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	American eel													-	-	-	Jan-May	Jan-Dec
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov


FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	622.42	0.97
10B	Freshwater Marshes	15.57	0.02
10D	Scrub and Shrub Wetlands	2.28	0.00
9A	Sheltered Tidal Flats	2.79	0.00
7	Exposed Tidal Flats	70.14	0.11



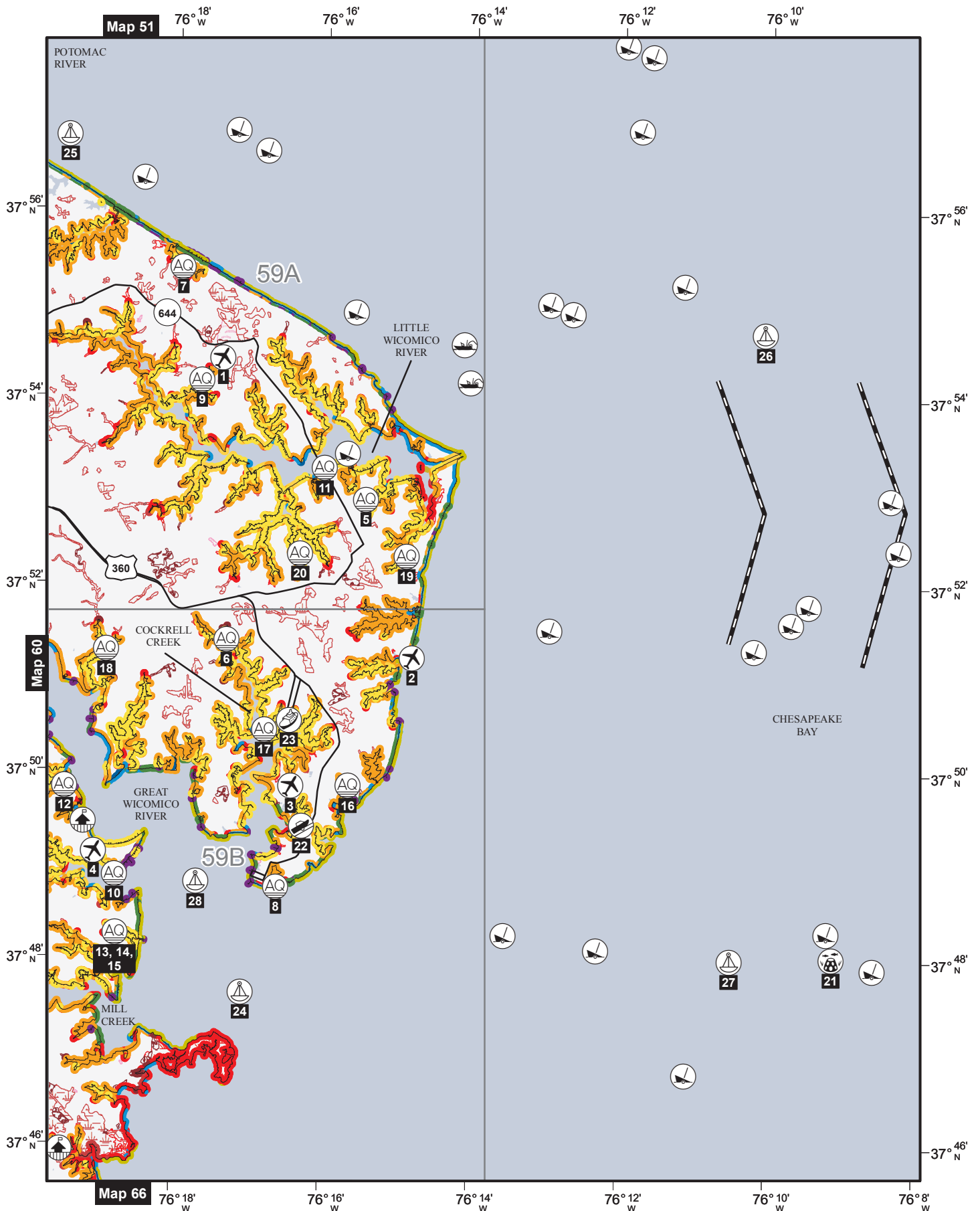
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	42,917.97	26.67	48%
10D	Scrub and Shrub Wetlands	5,689.07	3.54	6%
9A	Sheltered Tidal Flats	1,324.28	0.82	1%
9B	Vegetated Low Banks	39.31	0.02	< 1%
8B	Sheltered, Solid Man-Made Structures	2,262.92	1.41	3%
8C	Sheltered Riprap	70.90	0.04	< 1%
7	Exposed Tidal Flats	21,727.24	13.50	24%
6B	Riprap	2,725.85	1.69	3%
3A	Fine to Medium Grained Sand Beaches	12,525.75	7.78	14%
1B	Exposed, Solid Man-Made Structures	278.93	0.17	< 1%
Total ESI Shoreline:		89,562.23	55.65	
Total Shoreline:		51,323.37	31.89	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 59
Central Bay



SEE BACK OF MAP
for details about mapped resources and
other resources that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 2 Miles
0 2 Kilometers

1:100,000



Map 59
Central Bay

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
Map ID	Type	Name	Contact Phone
1	AIRPORT	FEDERHART-OPHELIA	
2	AIRPORT	LAND'S END	
3	AIRPORT	REEDVILLE	
4	AIRPORT	REMO PRIVATE	
5	AQUACULTURE	OYSTER NON-COMM ALLEN RF#98-2025	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
6	AQUACULTURE	OYSTER NON-COMM BRANCH, JAMES RF#98-1619	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
7	AQUACULTURE	OYSTER NON-COMM HILLEN RF#99-2049	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
8	AQUACULTURE	OYSTER NON-COMM KOEHLER, BILL RF#98-1481	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
9	AQUACULTURE	OYSTER NON-COMM LAND RF#99-1985	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
10	AQUACULTURE	OYSTER NON-COMM LAUBER, RAY RF#98-1764	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
11	AQUACULTURE	OYSTER NON-COMM LIVEZEY, JANET RF#2001-1083	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
12	AQUACULTURE	OYSTER NON-COMM OVERCASH, K.E. RF#98-0759	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
13	AQUACULTURE	OYSTER NON-COMM PAYNE, JAMES RF#2000-0721	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
14	AQUACULTURE	OYSTER NON-COMM PERRY, RON RF#00-1826	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
15	AQUACULTURE	OYSTER NON-COMM PISCIOTTA RF#00-0637	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
16	AQUACULTURE	OYSTER NON-COMM PULLY RF#00-0185	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
17	AQUACULTURE	OYSTER NON-COMM SLIEKO, MARK RF#98-1696	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
18	AQUACULTURE	OYSTER NON-COMM WILLIAMS RF#99-0345	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
19	AQUACULTURE	OYSTER NON-COMM WISE RF#98-1772	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
20	AQUACULTURE	OYSTER NON-COMM WISE, LLOYD, E. RF#98-0778	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
21	ARTIFICIAL REEF	NORTHERN NECK	
22	BOAT RAMP	SHELL	LENE PENNINGTON, VDGIF 804-367-0058
23	FERRY	REEDVILLE FERRY	
24	REPEATED MEASUREMENT SITE	MWS - SITE CBIB	GREG PINIAK, PROJECT MANAGER 301-713-3028
25	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, POTOMAC RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT 410-537-3608
26	REPEATED MEASUREMENT SITE	WQ - STATION CB5.3	CHESAPEAKE BAY PROGRAM 800-968-7229
27	REPEATED MEASUREMENT SITE	WQ - STATION CB5.4	CHESAPEAKE BAY PROGRAM 800-968-7229
28	REPEATED MEASUREMENT SITE	WQ - STATION CB5.4W	CHESAPEAKE BAY PROGRAM 800-968-7229
ALSO PRESENT IN MAPPED AREA (POLYGONS)			
Type	Name	Contact	Phone
STATE PROTECTED AREA	BLUE CRAB SANCTUARY	VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200
STATE PROTECTED AREA	DAMERON MARSH	VA DEPT OF CONSERVATION AND RECREATION	

JURISDICTIONS

COUNTY: ACCOMACK CO., NORTHUMBERLAND CO., SOMERSET CO., ST. MARY'S CO. **FEMA:** REGION I
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE, SECTOR HAMPTON ROADS **EPA:** REGION 3
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT, NORFOLK DISTRICT

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	418.11	0.65
10B	Freshwater Marshes	37.73	0.06
10C	Swamps	897.70	1.40
10D	Scrub and Shrub Wetlands	149.31	0.23
7	Exposed Tidal Flats	4.00	0.01



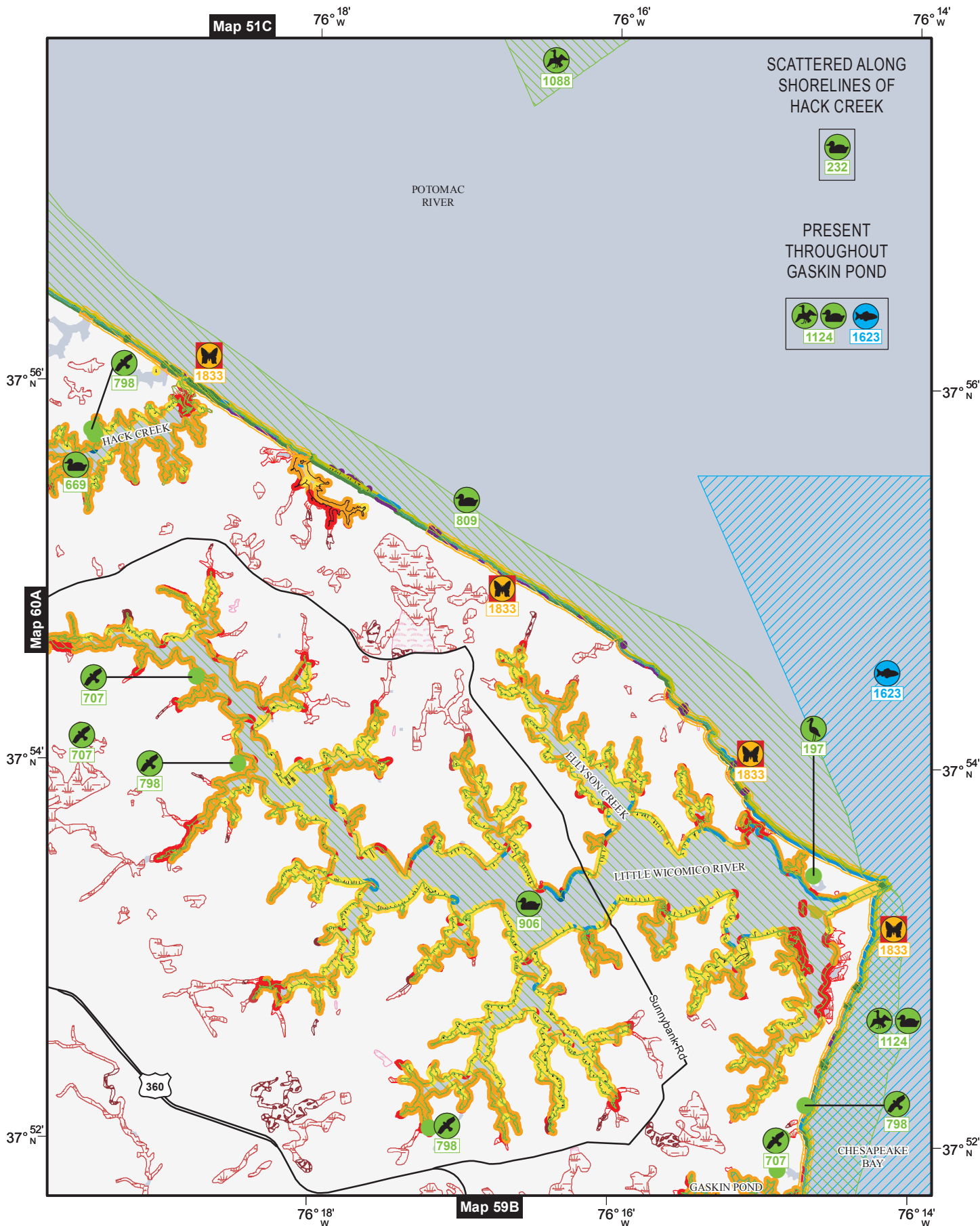
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	72,311.20	44.93	16%
10C	Swamps	2,702.57	1.68	1%
10D	Scrub and Shrub Wetlands	2,229.06	1.39	< 1%
9B	Vegetated Low Banks	187,930.63	116.77	41%
8B	Sheltered, Solid Man-Made Structures	57,196.55	35.54	13%
8C	Sheltered Riprap	33,363.88	20.73	7%
7	Exposed Tidal Flats	36,001.77	22.37	8%
6B	Riprap	21,427.90	13.31	5%
4	Coarse Grained Sand Beaches	33,719.69	20.95	7%
3B	Scarps and Steep Slopes (Sand)	1,860.94	1.16	< 1%
1B	Exposed, Solid Man-Made Structures	5,759.58	3.58	1%
Total ESI Shoreline:		454,503.76	282.42	
Total Shoreline:		371,520.66	230.85	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 59A
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 1 Miles
0 1 Kilometers

1:50,000



Map 59A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
197	Wading	Great blue heron	Nesting				90 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
669	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American coot	Wintering				10S													-	-	-	-
	Waterfowl	American wigeon	Wintering				Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering				10,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				1,000S													-	-	-	-
	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
707	Raptor	Bald eagle	Roosting				-													Dec-Jun	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													-	-	-	-
809	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				Present													-	-	-	-
906	Waterfowl	American black duck	Wintering				Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S													-	-	-	-
1088	Diving	D. crested cormorant	Migration				1,000S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering				100S													-	-	-	-
1124	Diving	Grebes	Wintering				Present													-	-	-	-
	Diving	Red-throated loon	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-

FISH




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1623	Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	Diadromous	Striped bass	Migration			-													-	-	-	-	Feb-Jun

INVERTEBRATES


Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-													Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Common loon	Wintering			Present													-	-	-	
	Common loon	Wintering			100S													-	-	-	
	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	
	Grebes	Wintering			100S													-	-	-	
	Red-throated loon	Wintering			Present													-	-	-	
	Red-throated loon	Wintering			100S													-	-	-	
	Northern gannet	Wintering			100S													-	-	-	
	Northern gannet	Wintering			Present													-	-	-	
	Long-tailed duck	Wintering			100S													-	-	-	
	Scoters	Wintering			100S													-	-	-	
	Scoters	Wintering			10,000S													-	-	-	
	Tundra swan	Wintering			10S													-	-	-	

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diadromous																				
	Alewife	Migration			-															Aug-Nov	Mar-May
	Alewife	Migration			Moderate Run															Aug-Nov	Mar-May
	American shad	Migration			Strong Run															Aug-Nov	Mar-May
	American shad	Migration																		Aug-Nov	Mar-May
	Atlantic sturgeon	General Distribution			-															Aug-Nov	Mar-Jun
	Atlantic sturgeon	General Distribution	-/E	E																Aug-Nov	Mar-Jun
	Blueback herring	Migration			Moderate Run															Aug-Nov	Jan-Dec
	Blueback herring	Migration																		Aug-Nov	Feb-Jun
	Blueback herring	Migration																		Aug-Nov	Feb-Jun
	Hickory shad	Migration			-															Jun-Oct	Feb-Jun
	Hickory shad	Migration			Moderate Run															Jun-Oct	Feb-Jun
	Hickory shad	Migration																		Jun-Oct	Feb-Jun
	Shortnose sturgeon	General Distribution	E/E	E																Jan-Dec	Jan-Dec
	Shortnose sturgeon	Migration	E/E	E																-	Mar-Jun
	Striped bass	Migration			-															-	Mar-Jun
	Striped bass	Nursery Area																	Apr-Jun	Jan-Dec	-
	Striped bass																				
	Striped bass																				
	Striped bass																				

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Turtle																				
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon															Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common															Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common															Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant															Apr-Oct	Apr-Oct
	Loggerhead sea turtle																				




INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Crab																				
	Blue crab	Concentration Area			Highly Abundant-Summ															Jun-Oct	Jun-Oct






MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D			
	Manatee	General Distribution	-/E	E	Rare															-
	Manatee	General Distribution	E/E	E	Very Rare															-
	Whale	General Distribution	E/E	E	Very Rare															-
	Humpback whale	General Distribution	E/E	E	Very Rare															-

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Molt
		J	F	M	A	M	J	J	A	S	O	N	D					
	Brown pelican													-	-	-	-	-
	Brown pelican													-	-	-	-	-
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-
	Storm-petrels													-	-	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	-	Apr-Nov
	Spotted seatrout													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Aug-Dec	Apr-Dec
	Weakfish													-	-	Feb-May	Apr-Dec	Jan-Dec
	White perch													-	-	May-Aug	Jun-Dec	Apr-Dec
	Winter flounder													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	-	Dec-Mar
	Silversides													Mar-Jul	Mar-Jul	-	Jan-Dec	Jan-Dec
	Anchovies													-	-	-	Mar-Nov	Mar-Nov
	Striped burrfish													Apr-Sep	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleamose skate													-	-	-	-	Jun-Sep
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Marine Pelagic	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Bivalve	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
Cephalopod	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
Crab	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
Shrimp	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

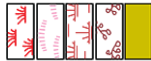
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Dolphin	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	139.20	0.22
10B	Freshwater Marshes	34.20	0.05
10C	Swamps	498.37	0.78
10D	Scrub and Shrub Wetlands	64.94	0.10
7	Exposed Tidal Flats	4.00	0.01



ESI SHORELINE HABITAT TYPES

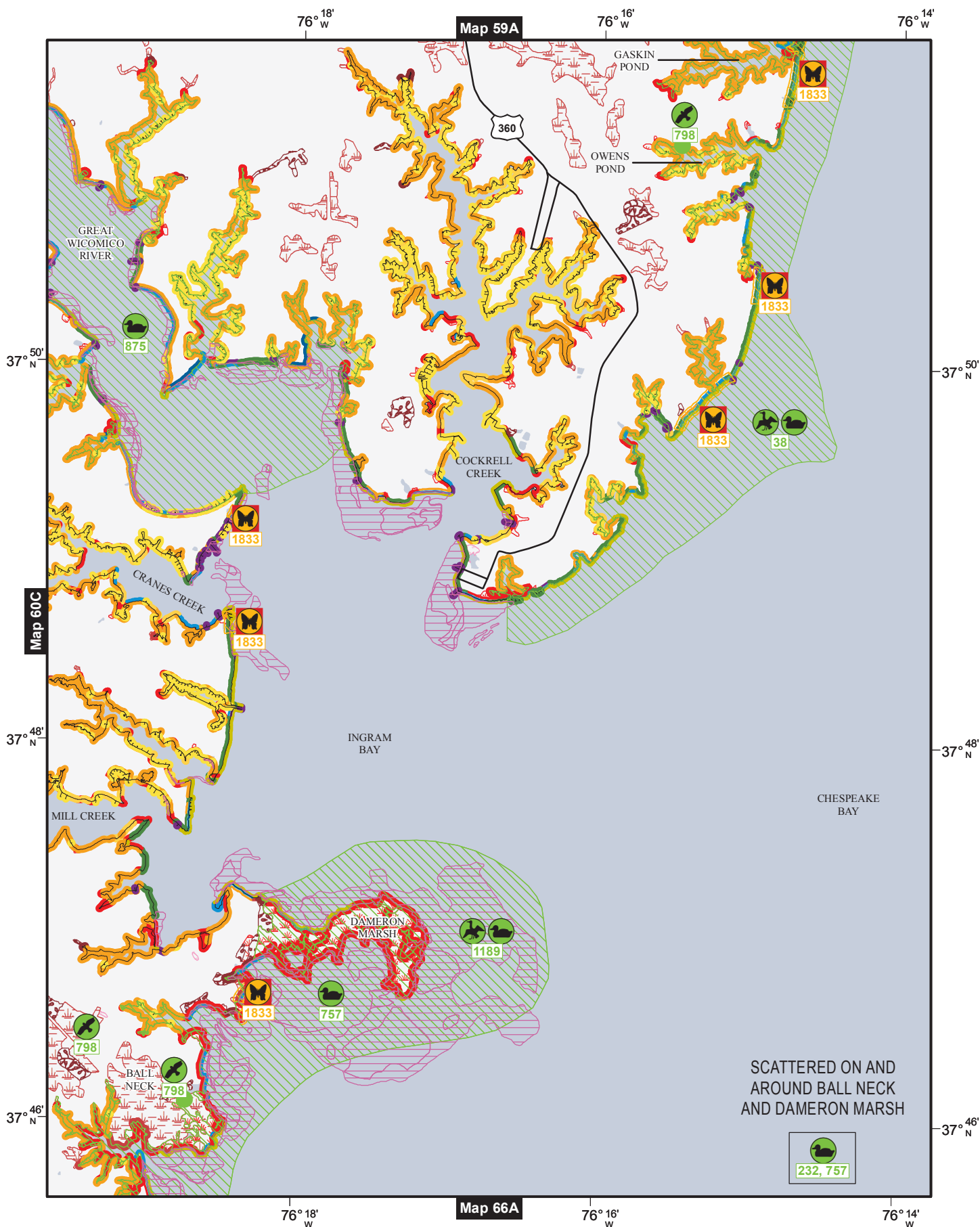
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	29,322.94	18.22	14%
10C	Swamps	805.44	0.50	< 1%
10D	Scrub and Shrub Wetlands	816.16	0.51	< 1%
9B	Vegetated Low Banks	93,073.90	57.83	45%
8B	Sheltered, Solid Man-Made Structures	28,694.36	17.83	14%
8C	Sheltered Riprap	14,638.32	9.10	7%
7	Exposed Tidal Flats	13,646.84	8.48	7%
6B	Riprap	5,973.84	3.71	3%
4	Coarse Grained Sand Beaches	17,178.47	10.67	8%
3B	Scarps and Steep Slopes (Sand)	511.60	0.32	< 1%
1B	Exposed, Solid Man-Made Structures	2,709.57	1.68	1%

Total ESI Shoreline: 207,371.44 Total ESI Shoreline: 128.85
 Total Shoreline: 173,950.97 Total Shoreline: 108.09

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 59B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value			High												
SAV	Submerged aquatic veg	High Ecological Value			Low												

BIRDS




Map ID	Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence										Nest	Mig.(S)	Mig.(F)	Molt
							J	F	M	A	M	J	J	A	S	O	N			
38	Diving	Grebes	Wintering			Present												-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-
	Waterfowl	Canada goose	Wintering			100S												-	-	-
	Waterfowl	Scoters	Wintering			100S												-	-	-
232	Waterfowl	Canada goose	Nesting			Present											Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present											Mar-Aug	-	-	Jul-Aug
757	Waterfowl	American black duck	Wintering			100S												-	-	-
	Waterfowl	American wigeon	Wintering			10S												-	-	-
	Waterfowl	Canvasback	Wintering			100S												-	-	-
	Waterfowl	Gadwall	Wintering			100S												-	-	-
	Waterfowl	Mallard	Wintering			100S												-	-	-
	Waterfowl	Redhead	Wintering			Present												-	-	-
	Waterfowl	Scaup	Wintering			100S												-	-	-
	Waterfowl	Tundra swan	Wintering			100S												-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest											Dec-Jun	-	-	-
875	Waterfowl	American black duck	Wintering			Present												-	-	-
	Waterfowl	Blue-winged teal	Migration			10S												Feb-Apr	Aug-Oct	-
	Waterfowl	Canvasback	Wintering			10S												-	-	-
	Waterfowl	Common goldeneye	Wintering			Present												-	-	-
	Waterfowl	Green-winged teal	Wintering			10S												-	-	-
	Waterfowl	Mallard	Wintering			10S												-	-	-
	Waterfowl	Redhead	Wintering			100S												-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S												-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S												-	-	-
	Waterfowl	Tundra swan	Wintering			Present												-	-	-
1189	Diving	D. crested cormorant	Wintering			100S												Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering			10S												-	-	-
	Waterfowl	Scoters	Wintering			10S												-	-	-

INVERTEBRATES


Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-													Jun-Aug	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			100S													-	-	-	
		Common loon			Present													-	-	-	
		D. crested cormorant			1,000S													-	Mar-May	Aug-Nov	
		Grebes			100S													-	-	-	
		Red-throated loon			10S													-	-	-	
	Pelagic	Red-throated loon			100S													-	-	-	
		Northern gannet			100S													-	-	-	
		Waterfowl	American black duck			10S												-	-	-	
			Bufflehead			100S													-	-	-
			Canada goose			1,000S													-	-	-
		Long-tailed duck			100S													-	-	-	
		Long-tailed duck			10S													-	-	-	
		Mallard			Present													-	-	-	
		Mergansers			100S													-	-	-	
		Ruddy duck			100S													-	-	-	
		Scoters			10,000S													-	-	-	
		Tundra swan			10S													-	-	-	

FISH

Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Diadromous	Alewife			-													-	-	Aug-Nov	Feb-Apr
		American shad			-													-	-	Aug-Nov	Feb-Jun
		Atlantic sturgeon			-/E	E												-	-	-	Jan-Dec
		Blueback herring			-													-	-	Aug-Nov	Mar-Jun
		Hickory shad			-													-	-	Jun-Sep	Feb-May
		Shortnose sturgeon			E/E	E												-	-	Jan-Dec	Jan-Dec
		Striped bass			-													-	-	-	Feb-Jun

REPTILES & AMPHIBIANS

<div><div></div></div> Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults	
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
<div><div></div></div>	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults	
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D
Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
Manatee	West Indian manatee	General Distribution	-/E	E	Rare												-	-	-	-
Whale	Humpback whale	General Distribution	E/E	E	Very Rare												-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS





Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-
Gull/Tern	Gulls													-	-	-	-
	Terns													-	-	-	-
Pelagic	Storm-petrels													-	-	-	-
Waterfowl	Wood duck													-	-	-	-

FISH





Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec

Central Bay: Map 59B


FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Estuarine Resident													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	-	Jan-Dec
	Fish													Mar-Jul	Mar-Jul	-	Mar-Nov	Jan-Dec
	Silversides													Apr-Sep	-	-	-	Jan-Dec
	Anchovies													-	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Eastern oyster													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Cephalopod													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Stout razor clam													-	-	-	Apr-Dec	Apr-Dec
	Crab													-	-	-	Jan-Dec	Jan-Dec
	Squid													-	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

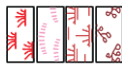
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	278.91	0.44
10B	Freshwater Marshes	3.54	0.01
10C	Swamps	399.33	0.62
10D	Scrub and Shrub Wetlands	84.37	0.13



ESI SHORELINE HABITAT TYPES

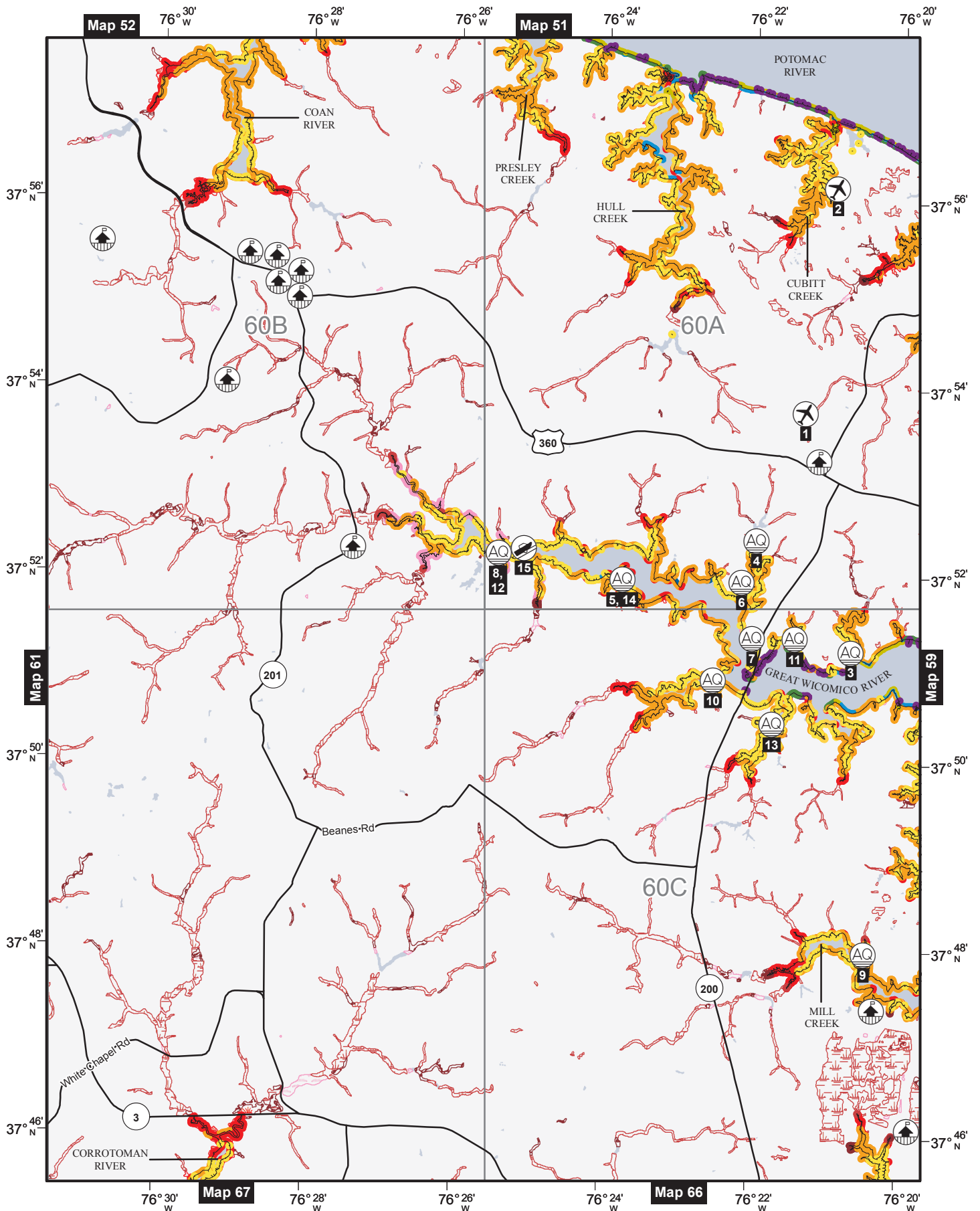
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	42,988.25	26.71	17%
10C	Swamps	1,897.13	1.18	1%
10D	Scrub and Shrub Wetlands	1,412.90	0.88	1%
9B	Vegetated Low Banks	94,856.73	58.94	38%
8B	Sheltered, Solid Man-Made Structures	28,502.19	17.71	12%
8C	Sheltered Riprap	18,725.56	11.64	8%
7	Exposed Tidal Flats	22,354.93	13.89	9%
6B	Riprap	15,454.06	9.60	6%
4	Coarse Grained Sand Beaches	16,541.22	10.28	7%
3B	Scarps and Steep Slopes (Sand)	1,349.34	0.84	1%
1B	Exposed, Solid Man-Made Structures	3,050.01	1.90	1%

Total ESI Shoreline: 247,132.32 Total ESI Shoreline: 153.56
Total Shoreline: 197,569.69 Total Shoreline: 122.76

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 60 Central Bay



SEE BACK OF MAP
for details about mapped resources and
other resources that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 2 Miles
0 2 Kilometers

1:100,000



Map 60
Central Bay

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	AIRPORT	JETT AIRPARK		
2	AIRPORT	SERENITY FARM		
3	AQUACULTURE	OYSTER COMMERCIAL MIX, DAVID A. RF#02-0026	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
4	AQUACULTURE	OYSTER NON-COMM CALLENDEN, ROBERT, E. RF#99-1182	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	AQUACULTURE	OYSTER NON-COMM FOLTS, JAMES RF#98-2026	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
6	AQUACULTURE	OYSTER NON-COMM GROMELSKI, STAN RF#99-1248	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
7	AQUACULTURE	OYSTER NON-COMM KAUDERS, ANDREW E. RF#98-1722	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
8	AQUACULTURE	OYSTER NON-COMM LOCKHART, KENT RF#00-0385	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
9	AQUACULTURE	OYSTER NON-COMM MCKINLEY, ROGER RF#01-0357	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
10	AQUACULTURE	OYSTER NON-COMM MIZUNO RF#00-1814	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
11	AQUACULTURE	OYSTER NON-COMM SMITH, HERBERT RF#99-1001	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
12	AQUACULTURE	OYSTER NON-COMM STEG RF#00-2118	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
13	AQUACULTURE	OYSTER NON-COMM TEXTER RF#99-0830	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
14	AQUACULTURE	OYSTER NON-COMM WINKEL, RAYMOND N. RF#99-1177	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
15	BOAT RAMP	COOPERS	LENE PENNINGTON, VDGIF	804-367-0058

ALSO PRESENT IN MAPPED AREA (POLYGONS)			
Type	Name	Contact	Phone
STATE PROTECTED AREA	BUSH MILL STREAM	VA DEPT OF CONSERVATION AND RECREATION	
STATE PROTECTED AREA	CHILTON WOODS	VA DEPT OF FORESTRY	
STATE PROTECTED AREA	HICKORY HOLLOW	NORTHERN NECK AUDUBON SOCIETY	

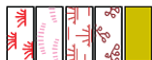
JURISDICTIONS

COUNTY: LANCASTER CO., NORTHUMBERLAND CO., RICHMOND CO., ST. MARY'S CO. **FEMA:** REGION I
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE, SECTOR HAMPTON ROADS **EPA:** REGION 3
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT, NORFOLK DISTRICT

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	369.42	0.58
10B	Freshwater Marshes	170.52	0.27
10C	Swamps	3,337.00	5.21
10D	Scrub and Shrub Wetlands	480.37	0.75
7	Exposed Tidal Flats	13.66	0.02



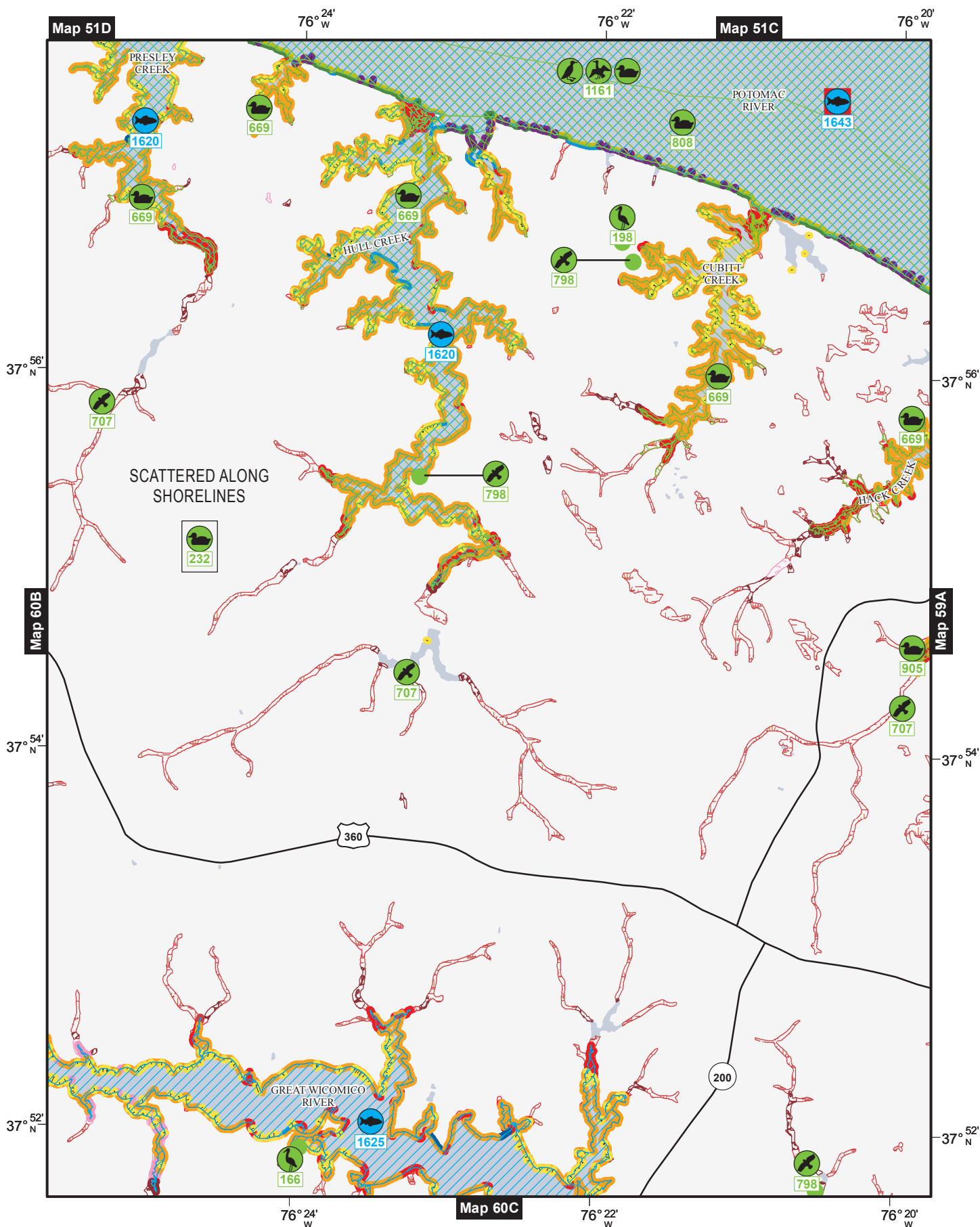
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	61,992.42	38.52	20%
10B	Freshwater Marshes	12,310.97	7.65	4%
10C	Swamps	1,834.25	1.14	1%
10D	Scrub and Shrub Wetlands	2,166.45	1.35	1%
9B	Vegetated Low Banks	161,918.60	100.61	53%
8B	Sheltered, Solid Man-Made Structures	24,614.37	15.29	8%
8C	Sheltered Riprap	8,105.59	5.04	3%
7	Exposed Tidal Flats	11,184.50	6.95	4%
6B	Riprap	7,288.87	4.53	2%
4	Coarse Grained Sand Beaches	9,238.71	5.74	3%
3B	Scarps and Steep Slopes (Sand)	1,330.38	0.83	< 1%
1B	Exposed, Solid Man-Made Structures	4,435.19	2.76	1%
Total ESI Shoreline:		306,420.31	190.40	
Total Shoreline:		280,727.37	174.44	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 60A

Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 1 Miles
0 1 Kilometers

1:50,000



Map 60A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
166	Wading	Great blue heron	Nesting				11 Nests													Feb-Jun	-	-	-
198	Wading	Great blue heron	Nesting				46 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
669	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American coot	Wintering				10S													-	-	-	-
	Waterfowl	American wigeon	Wintering				Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering				10,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				1,000S													-	-	-	-
	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
707	Raptor	Bald eagle	Roosting				-													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
808	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				Present													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
905	Waterfowl	American black duck	Wintering				Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
1161	Diving	Common loon	Wintering				Present													-	-	-	-
	Diving	Grebes	Wintering				100S													-	-	-	-
	Diving	Red-throated loon	Wintering				Present													-	-	-	-

BIRDS (continued)


Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Eggs	Larvae	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						
	Pelagic	Northern gannet	Wintering			Present												-	-	-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			100S												-	-	-	-	-	-
	Waterfowl	Scoters	Wintering			100S												-	-	-	-	-	-

FISH


Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1620	Diadromous	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr
1625	Diadromous	Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun
1643	Diadromous	Striped bass	Migration			-												-	-	-	-	Feb-Jun
	Diadromous	Alewife	Migration			Moderate Run												-	-	-	Aug-Nov	Mar-May
	Diadromous	American shad	Migration			Strong Run												-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Blueback herring	Migration			Moderate Run												-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Hickory shad	Migration			Moderate Run												-	-	-	Jun-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	Migration	E/E	E	-												-	-	-	-	Mar-Jun
	Diadromous	Striped bass	Nursery Area			-												-	-	Apr-Jun	Jan-Dec	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Diadromous	Atlantic sturgeon	-/E	E	-												-	-	-	-	Jan-Dec
		Shortnose sturgeon	E/E	E	-												-	-	-	Jan-Dec	Jan-Dec

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Turtle	K. ridley sea turtle	E/E	E	Common												-	-	-	Apr-Oct	-
		K. ridley sea turtle	E/E	E	Uncommon												-	-	-	Nov-Dec	-
		Loggerhead sea turtle	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec
		Loggerhead sea turtle	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES



Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Crab	Blue crab			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS







Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Manatee	West Indian manatee	-/E	E	Rare												-	-	-	-

Central Bay: Map 60A

BIRDS

Subelement	Species	Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	-	Apr-Nov
	Spotted seatrout													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													May-Jul	-	-	Apr-Nov	Apr-Nov
	Weakfish													-	-	Feb-May	Apr-Dec	Jan-Dec
	White perch													-	-	May-Aug	Jun-Dec	Apr-Dec
	Winter flounder													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	-	Dec-Mar
	Silversides													-	-	-	Jan-Dec	Jan-Dec
	Anchovies													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Striped burrfish													Apr-Sep	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleannose skate													-	-	-	-	Jun-Sep
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													Jun-Jul	-	-	May-Oct	May-Oct
	Red hake													May-Jul	-	-	-	Apr-Dec
	Silver hake													-	-	-	-	Sep-May*
	Spotted hake													-	-	-	-	Oct-May
	Butterfish													-	-	-	Jan-Dec	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Butterfish													-	-	Jul-Sep	Mar-Nov
	Cobia													-	-	-	Jun-Sep
	Harvestfish													-	-	-	May-Nov
	Lined seahorse													-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	May-Sep
														-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Eastern oyster													-	-	Jan-Dec	Jan-Dec
	Softshell clam													-	-	Jan-Dec	Jan-Dec
	Squid													-	-	Apr-Dec	Apr-Dec
	Blue crab													-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-
														-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	124.04	0.19
10B	Freshwater Marshes	17.71	0.03
10C	Swamps	482.30	0.75
10D	Scrub and Shrub Wetlands	89.83	0.14
7	Exposed Tidal Flats	13.66	0.02



ESI SHORELINE HABITAT TYPES

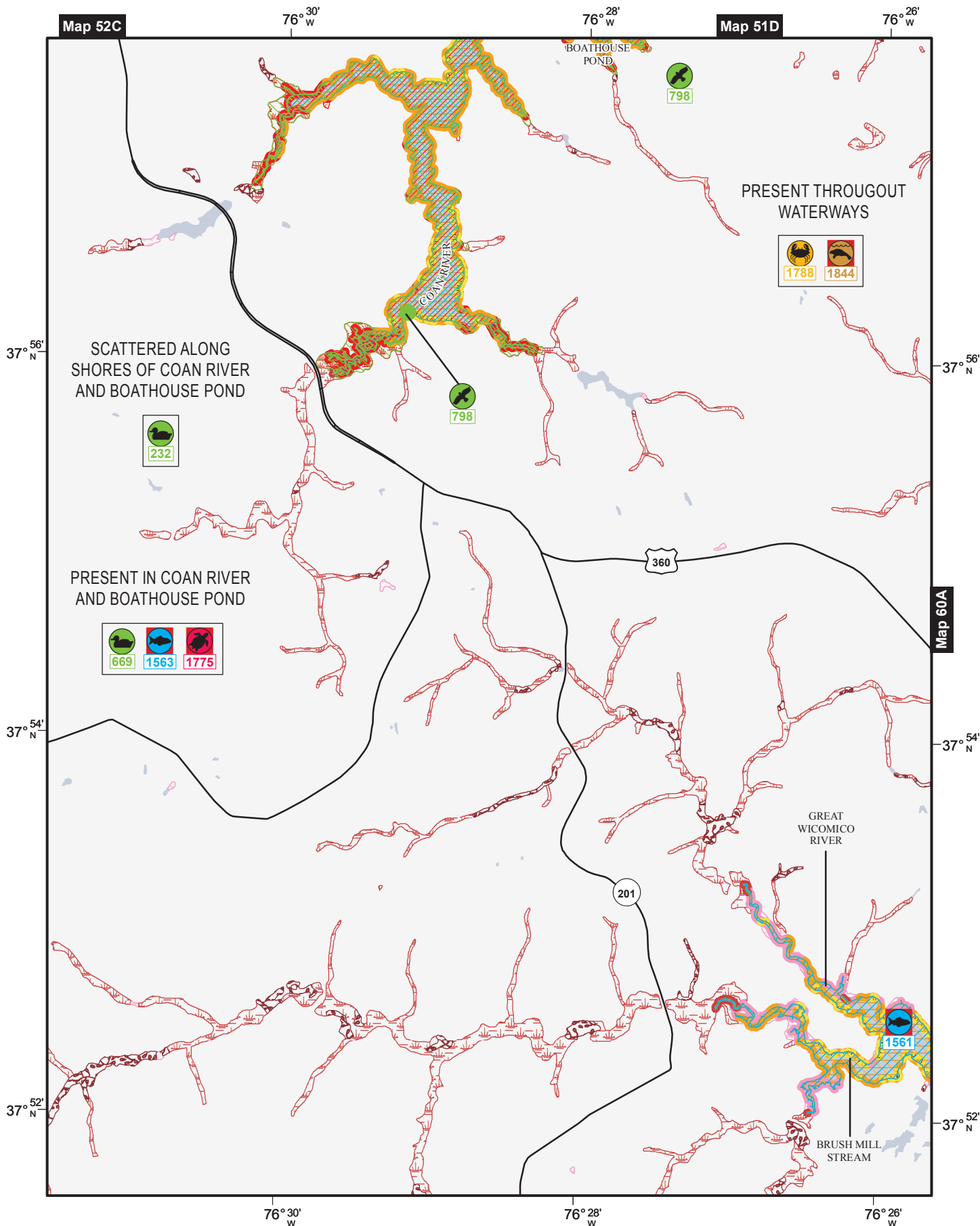
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	25,993.10	16.15	17%
10B	Freshwater Marshes	2,953.27	1.84	2%
10C	Swamps	144.85	0.09	< 1%
10D	Scrub and Shrub Wetlands	1,115.75	0.69	1%
9B	Vegetated Low Banks	86,819.81	53.95	56%
8B	Sheltered, Solid Man-Made Structures	10,148.76	6.31	7%
8C	Sheltered Riprap	2,458.19	1.53	2%
7	Exposed Tidal Flats	8,929.42	5.55	6%
6B	Riprap	5,266.07	3.27	3%
4	Coarse Grained Sand Beaches	6,890.27	4.28	4%
3B	Scarps and Steep Slopes (Sand)	1,032.88	0.64	1%
1B	Exposed, Solid Man-Made Structures	2,372.07	1.47	2%

Total ESI Shoreline: 154,124.45 Total ESI Shoreline: 95.77
 Total Shoreline: 135,389.38 Total Shoreline: 84.13

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 60B
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 1 Miles
0 1 Kilometers

1:50,000



Map 60B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
232	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
669	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American coot	Wintering				10S													-	-	-	-
	Waterfowl	American wigeon	Wintering				Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering				10,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				1,000S													-	-	-	-
	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
1561	Diadromous	Alewife	Migration				-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution				-/E E													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Migration				-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Shortnose sturgeon	General Distribution				E/E E													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Migration				-													-	-	-	-	Feb-Jun
1563	Diadromous	Alewife	Migration				-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution				-/E E													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Migration				-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Shortnose sturgeon	General Distribution				E/E E													-	-	-	Aug-Nov	Jan-Dec

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1775	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec

INVERTEBRATES




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	Alewife													-	-	-	Jan-May	Jan-Dec
	American eel													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Blueback herring													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Gizzard shad													-	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	-	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Spotted seatrout													-	-	-	Aug-Dec	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Resident													Mar-Jul	Mar-Jul	-	Jan-Dec	Jan-Dec
	Silversides													-	-	-	Mar-Nov	Mar-Nov

Central Bay: Map 60B

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
 Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
 Marine Benthic	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
 Marine Pelagic	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
 Bivalve	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
 Crab	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
 Shrimp	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

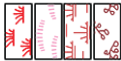
MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
 Dolphin	Bottlenose dolphin													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	94.56	0.15
10B	Freshwater Marshes	66.58	0.10
10C	Swamps	822.92	1.29
10D	Scrub and Shrub Wetlands	153.42	0.24



ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	10,444.06	6.49	24%
10B	Freshwater Marshes	9,061.94	5.63	21%
10C	Swamps	973.54	0.60	2%
9B	Vegetated Low Banks	19,720.70	12.25	46%
8B	Sheltered, Solid Man-Made Structures	2,730.47	1.70	6%
8C	Sheltered Riprap	203.00	0.13	< 1%

Total ESI Shoreline: 43,133.71 Total ESI Shoreline: 26.80
 Total Shoreline: 43,114.35 Total Shoreline: 26.79

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 60C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence											
							J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value				Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value				High												
SAV	Submerged aquatic veg	High Ecological Value				Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence										Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O				
798	Raptor	Bald eagle	Nesting				1 Nest											Dec-Jun	-	-	-
1133	Diving	Red-throated loon	Wintering				10S											-	-	-	-
	Pelagic	Northern gannet	Wintering				100S											-	-	-	-
	Waterfowl	American black duck	Wintering				10S											-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S											-	-	-	-
	Waterfowl	Canada goose	Wintering				100S											-	-	-	-
	Waterfowl	Mallard	Wintering				10S											-	-	-	-
	Waterfowl	Mergansers	Wintering				10S											-	-	-	-
	Waterfowl	Ruddy duck	Wintering				10S											-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S											-	-	-	-
1134	Diving	Red-throated loon	Wintering				10S											-	-	-	-
	Pelagic	Northern gannet	Wintering				100S											-	-	-	-
	Waterfowl	American black duck	Wintering				Present											-	-	-	-
	Waterfowl	Blue-winged teal	Migration				10S											-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering				100S											-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S											-	-	-	-
	Waterfowl	Canvasback	Wintering				10S											-	-	-	-
	Waterfowl	Common goldeneye	Wintering				Present											-	-	-	-
	Waterfowl	Green-winged teal	Wintering				10S											-	-	-	-
	Waterfowl	Mallard	Wintering				10S											-	-	-	-
	Waterfowl	Mergansers	Wintering				100S											-	-	-	-
	Waterfowl	Redhead	Wintering				100S											-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				10S											-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S											-	-	-	-
	Waterfowl	Tundra swan	Wintering				Present											-	-	-	-
1135	Diving	Red-throated loon	Wintering				10S											-	-	-	-
	Pelagic	Northern gannet	Wintering				100S											-	-	-	-
	Waterfowl	American black duck	Wintering				10S											-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S											-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S											-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	Mallard	Wintering			Present													-	-	-	
	Waterfowl	Mergansers	Wintering			100S													-	-	-	
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	
	Waterfowl	Tundra swan	Wintering			10S													-	-	-	

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1552	Diadromous	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr
	Diadromous	American shad	Migration			-												-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Hickory shad	Migration			-												-	-	-	Jun-Sep	Feb-May
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-												-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Migration			-												-	-	-	-	Feb-Jun
	Estuarine Nursery	Atl. sharpnose shark	Nursery Area			-												-	-	-	Jun-Sep	Jun-Sep
	Marine Pelagic	Sandbar shark	Nursery Area			-												-	-	-	May-Sep	May-Sep
1561	Diadromous	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-												-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Migration			-												-	-	-	-	Feb-Jun

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1775	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES



Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct
1814	Bivalve	Eastern elliptio	Vulnerable Occurrence			-												-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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1844	Manatee	West Indian manatee	General Distribution	-/E	E	Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</







BIRDS

Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Eggs	Larvae	Juveniles	Adults
	Brown pelican													-	-	-	Apr-Oct	Feb-Apr
	D. crested cormorant													-	Mar-May	Aug-Nov	-	-
	Gulls													-	-	-	-	-





FISH

Monthly Presence


Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	May-Oct	Jan-Dec
	Striped burrfish													-	-	-	-	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Clearnose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

Central Bay: Map 60C

INVERTEBRATES

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bivalve																
	Eastern oyster													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	Jan-Dec	Jan-Dec
	Cephalopod													-	Apr-Dec	Apr-Dec	Apr-Dec
	Squid													-	-	Jan-Dec	Jan-Dec
	Crab													-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	May-Oct	May-Oct
	Brown shrimp													-	-	Jan-Dec	Jan-Dec
	Shrimp													-	-	Jan-Dec	Jan-Dec
	Mantis shrimp													-	-	May-Oct	May-Oct
	White shrimp													-	-	May-Oct	May-Oct

MARINE MAMMALS

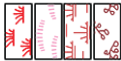
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin																
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	75.97	0.12
10B	Freshwater Marshes	39.26	0.06
10C	Swamps	1,151.93	1.80
10D	Scrub and Shrub Wetlands	87.18	0.14



ESI SHORELINE HABITAT TYPES

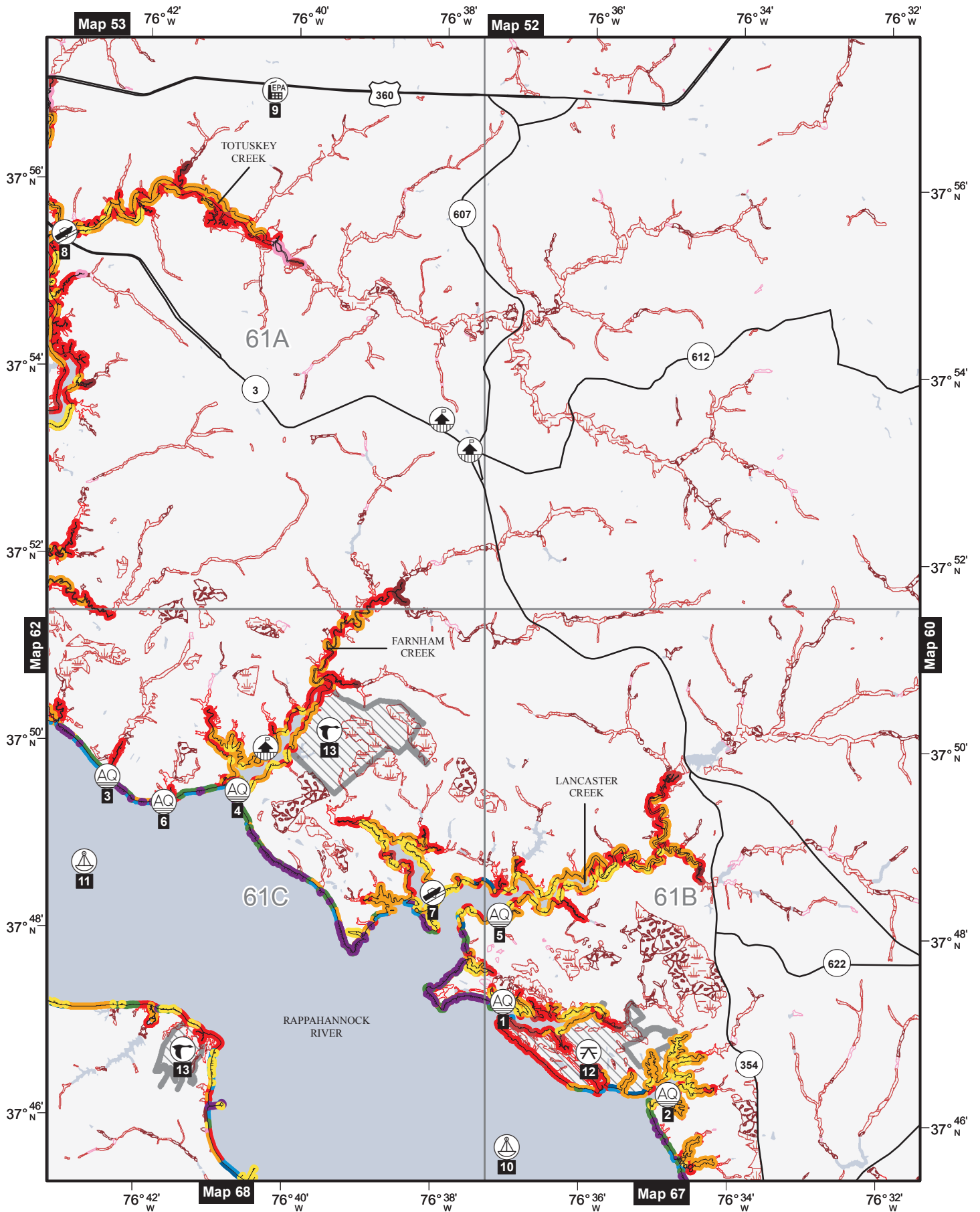
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	19,643.33	12.21	19%
10B	Freshwater Marshes	295.76	0.18	< 1%
10C	Swamps	715.86	0.44	1%
10D	Scrub and Shrub Wetlands	1,050.70	0.65	1%
9B	Vegetated Low Banks	53,821.08	33.44	53%
8B	Sheltered, Solid Man-Made Structures	11,353.52	7.05	11%
8C	Sheltered Riprap	5,444.40	3.38	5%
7	Exposed Tidal Flats	2,255.08	1.40	2%
6B	Riprap	2,022.80	1.26	2%
4	Coarse Grained Sand Beaches	2,348.44	1.46	2%
3B	Scarps and Steep Slopes (Sand)	297.50	0.18	< 1%
1B	Exposed, Solid Man-Made Structures	2,063.12	1.28	2%

Total ESI Shoreline: 101,311.59 Total ESI Shoreline: 62.95
 Total Shoreline: 94,744.33 Total Shoreline: 58.87

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 61 Central Bay



SEE BACK OF MAP
for details about mapped resources and
other resources that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 2 Miles
0 2 Kilometers

1:100,000



Map 61
Central Bay

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	AQUACULTURE	OYSTER COMMERCIAL ELDERT RF#01-1093	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
2	AQUACULTURE	OYSTER NON-COMM CHES BAY GOVERNOR'S RF#2000-1731	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
3	AQUACULTURE	OYSTER NON-COMM GRIM RF#98-1625	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
4	AQUACULTURE	OYSTER NON-COMM PARK, GEORGE M. RF#98-1937	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	AQUACULTURE	OYSTER NON-COMM RIGTERINK, RAY RF#98-0758	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
6	AQUACULTURE	OYSTER NON-COMM STEELE RF#98-2021	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
7	BOAT RAMP	SIMONSON LANDING	LENE PENNINGTON, VDGIF	804-367-0058
8	BOAT RAMP	TOTUSKEY	LENE PENNINGTON, VDGIF	804-367-0058
9	EPA FACILITY	HAYNESVILLE, VA 326	MANAGER	804-333-4234
10	REPEATED MEASUREMENT SITE	WQ - STATION LE3.1	CHESAPEAKE BAY PROGRAM	800-968-7229
11	REPEATED MEASUREMENT SITE	WQ - STATION RET3.2	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
12	PARK	BELLE ISLE STATE PARK	VA DEPT OF CONSERVATION AND RECREATION	
13	WILDLIFE REFUGE	RAPPAHANNOCK RIVER VALLEY NWR	UNITED STATES FISH AND WILDLIFE SERVICE	804-333-1470

ALSO PRESENT IN MAPPED AREA (POLYGONS)			
Type	Name	Contact	Phone
STATE PROTECTED AREA	CHILTON WOODS	VA DEPT OF FORESTRY	

JURISDICTIONS

COUNTY: ESSEX CO., LANCASTER CO., MIDDLESEX CO., NORTHUMBERL. CO., RICHMOND CO. **FEMA:** REGION I
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS **EPA:** REGION 3
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT, NORFOLK DISTRICT

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,385.81	2.17
10B	Freshwater Marshes	180.56	0.28
10C	Swamps	3,530.24	5.52
10D	Scrub and Shrub Wetlands	1,365.47	2.13
9A	Sheltered Tidal Flats	1.94	0.00
7	Exposed Tidal Flats	6.76	0.01

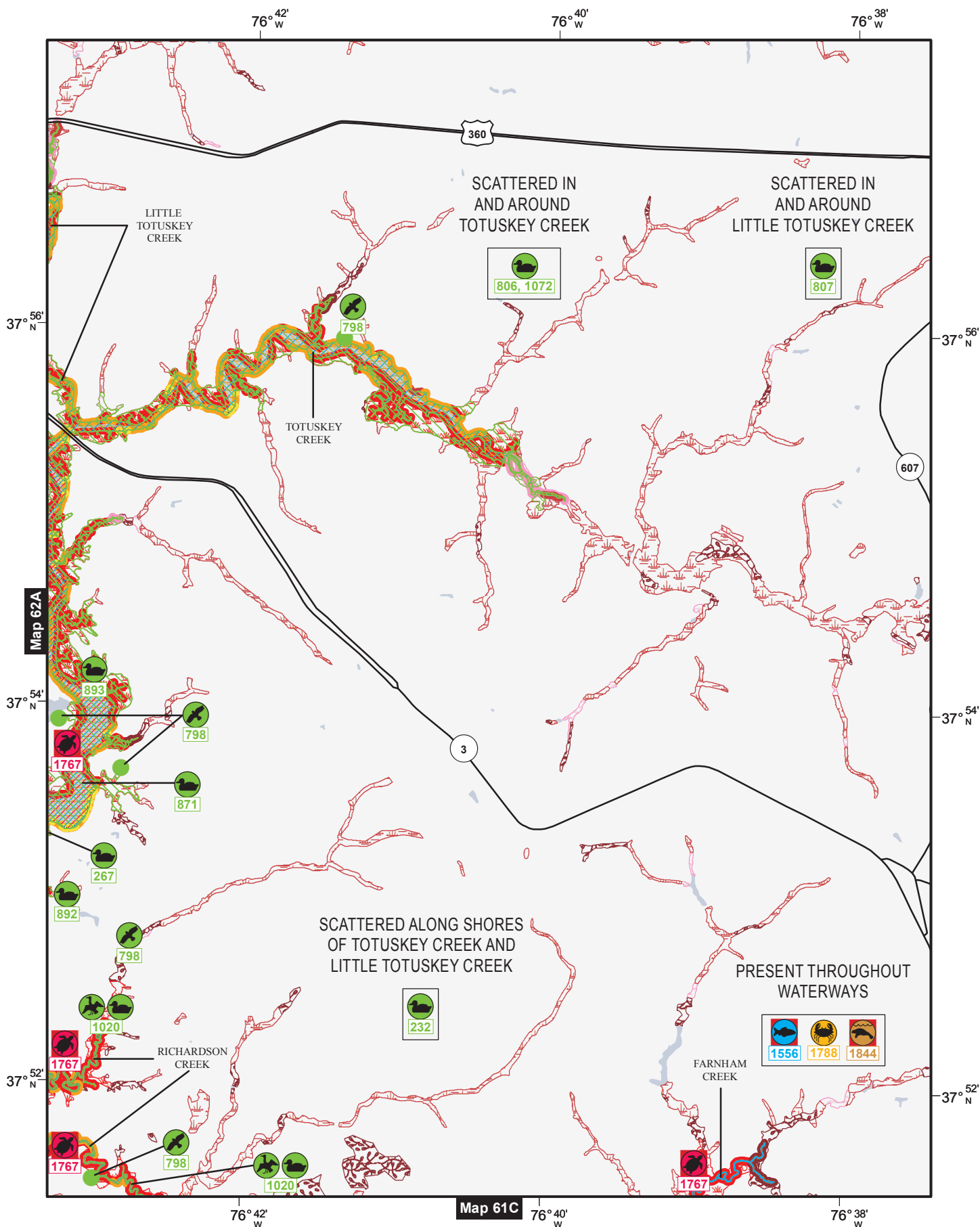
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	127,499.09	79.22	53%
10B	Freshwater Marshes	3,459.20	2.15	1%
10C	Swamps	2,761.88	1.72	1%
10D	Scrub and Shrub Wetlands	2,484.87	1.54	1%
9A	Sheltered Tidal Flats	2,269.29	1.41	1%
9B	Vegetated Low Banks	60,637.28	37.68	25%
8B	Sheltered, Solid Man-Made Structures	8,856.74	5.50	4%
8C	Sheltered Riprap	3,180.88	1.98	1%
7	Exposed Tidal Flats	121.16	0.08	< 1%
6B	Riprap	9,801.88	6.09	4%
4	Coarse Grained Sand Beaches	7,505.31	4.66	3%
3B	Scarps and Steep Slopes (Sand)	2,401.37	1.49	1%
1B	Exposed, Solid Man-Made Structures	7,743.57	4.81	3%
Total ESI Shoreline:		238,722.51	148.34	
Total Shoreline:		218,596.89	135.83	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 61A
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 1 Miles
0 1 Kilometers

1:50,000



Map 61A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
232	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
267	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
798	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
806	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
	Waterfowl	American black duck	Wintering				10S													-	-	-	-
807	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
871	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
	Waterfowl	Canvasback	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S													-	-	-	-
892	Waterfowl	Scaup	Wintering				100S													-	-	-	-
	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
893	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
1020	Diving	Common loon	Wintering				10S													-	-	-	-
	Diving	Grebes	Wintering				Present													-	-	-	-
	Diving	Red-throated loon	Wintering				10S													-	-	-	-
	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Brant	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering				10,000S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering			1,000S													-	-	-	-
	Waterfowl	Scoters	Wintering			100S													-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-
1072	Waterfowl	American black duck	Wintering			10S													-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1556	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Shorthose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Mar-May	Jan-Dec	Jan-Dec

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1767	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	May-Dec*	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	Jul-Oct	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS














Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
1844	Manatee	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)




BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Brown pelican																	-	-	-	-
		D. crested cormorant																	-	Mar-May	Aug-Nov	-
	Gull/Tern	Gulls																	-	-	-	-
		Terns																	-	-	-	-
	Waterfowl	Wood duck																	Apr-Jul	-	-	Jul-Aug

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	Alewife																	
	Estuarine Nursery													Mar-Jun	Mar-Jun	Apr-Jun	Jan-May	Jan-Dec
	American eel																	
	Blueback herring																	
	Striped bass																	
	Atlantic croaker																	
	Atlantic herring																	
	Atlantic menhaden																	
	Bluefish																	
	Kingfishes																	
	Red drum																	
	Spot																	
	Spotted seatrout													May-Jul				
	Summer flounder																	
	Weakfish																	
	White perch																	
	Pipefish																	
	Estuarine Resident																	
	Silversides													Mar-Jul	Mar-Jul			
	Fish													Apr-Sep				
	Anchovies													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Freshwater													Apr-Jun				
	Blue catfish																	
	Bullhead catfish																	
	Channel catfish													May-Jun				
	Longnose gar																	
	Spottail shiner																	
	Sunfish													May-Aug				
	Tessellated darter													Mar-Jul				
	Yellow perch													Apr-Jun				
	Northern searobin																	
	Marine Benthic																	
	Spotted hake																	
	Marine Pelagic																	
	Butterfish																	
	Harvestfish																	

INVERTEBRATES

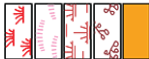
Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Eastern oyster													May-Dec*	May-Dec*	May-Jan*		
	Crab													Jun-Nov			Jan-Dec	Jan-Dec
	Blue crab																Jan-Dec	Jan-Dec
	Shrimp																May-Oct	May-Oct
	Brown shrimp																	
	White shrimp																May-Oct	May-Oct

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	482.80	0.75
10B	Freshwater Marshes	49.78	0.08
10C	Swamps	808.36	1.26
10D	Scrub and Shrub Wetlands	212.00	0.33
9A	Sheltered Tidal Flats	1.94	0.00



ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	46,398.18	28.83	73%
10B	Freshwater Marshes	3,317.17	2.06	5%
10C	Swamps	670.80	0.42	1%
10D	Scrub and Shrub Wetlands	1,884.50	1.17	3%
9A	Sheltered Tidal Flats	452.04	0.28	1%
9B	Vegetated Low Banks	9,568.60	5.95	15%
8B	Sheltered, Solid Man-Made Structures	577.23	0.36	1%
8C	Sheltered Riprap	272.78	0.17	< 1%

Total ESI Shoreline: 63,141.29 Total ESI Shoreline: 39.23
Total Shoreline: 62,141.64 Total Shoreline: 38.61

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 61B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
34	Waterfowl	Scoters	Wintering				100S													-	-	-	-
106	Wading	Great blue heron	Nesting				34 Nests													Feb-Jun	-	-	-
196	Wading	Great blue heron	Nesting				16 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
678	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				10S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
	Waterfowl	Canada goose	Wintering				10,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				100S													-	-	-	-
	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
680	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				10,000S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
910	Waterfowl	Blue-winged teal	Migration				10S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
	Waterfowl	Canvasback	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Scaup	Wintering				100S													-	-	-	-
	Waterfowl	Snow goose	Wintering				Present													-	-	-	-
955	Waterfowl	Brant	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Mergansers	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				1,000S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
1020	Diving	Common loon	Wintering			10S													-	-	-
	Diving	Grebes	Wintering			Present													-	-	-
	Diving	Red-throated loon	Wintering			10S													-	-	-
	Waterfowl	American black duck	Wintering			10S													-	-	-
	Waterfowl	Brant	Wintering			10S													-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-
1022	Waterfowl	Mergansers	Wintering			1,000S													-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-
	Waterfowl	Scaup	Wintering			1,000S													-	-	-
	Waterfowl	Scooters	Wintering			100S													-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-
1194	Diving	Common loon	Wintering			10S													-	-	-
	Diving	Grebes	Wintering			Present													-	-	-
	Diving	Red-throated loon	Wintering			10S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Diving	D. crested cormorant	Wintering			100S													-	-	-
	Waterfowl	Scooters	Wintering			10S													-	-	-


FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1599	Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Atlantic sturgeon	Migration			-													-	-	-	Aug-Nov	Jun-Nov
	Diadromous	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
1620	Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct
1789	Crab	Blue crab	Concentration Area			Highly Abundant													-	-	-	Jun-Mar*	Jun-Mar*
1813	Bivalve	Eastern elliptio	Vulnerable Occurrence			-													-	-	-	Jan-Dec	Jan-Dec
	Bivalve	Eastern floater	Vulnerable Occurrence			-													-	-	-	Jan-Dec	Jan-Dec
1834	Crab	Blue crab	Concentration Area			Highly Abundant-Wint													-	-	-	Dec-Mar	Dec-Mar

FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Nursery Area			-													-	-	Mar-May	Jan-Dec	-

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	Jul-Oct	-
	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	May-Dec*	-

MARINE MAMMALS





Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Brown pelican																	-	-	-	-	-
	D. crested cormorant																	-	-	-	-	-
	D. crested cormorant																	-	Mar-May	Aug-Nov	-	-
	Gulls																	-	-	-	-	-
	Terns																	-	-	-	-	-
	Wood duck																	Apr-Jul	-	-	-	Jul-Aug

FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife																	Feb-Apr	Feb-Apr	Feb-Apr	Feb-Apr	Feb-Apr
	American eel																	-	-	-	Jan-May	Jan-Dec
	Blueback herring																	Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Striped bass																	-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker																	-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring																	-	-	-	-	Jan-Jun
	Atlantic menhaden																	-	-	-	Jan-Dec	Jan-Dec
	Black drum																	Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Bluefish																	-	-	-	May-Oct	May-Oct
	Kingfishes																	-	-	-	-	Apr-Nov
	Northern puffer																	-	-	-	Mar-Oct	Mar-Oct
	Pigfish																	-	-	-	-	Apr-Nov

Central Bay: Map 61B

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Summer flounder													-	-	-	Apr-Oct	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Spotted hake													-	-	-	Dec-Jun	Dec-Jun
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

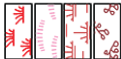
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	437.47	0.68
10B	Freshwater Marshes	74.02	0.12
10C	Swamps	1,097.12	1.71
10D	Scrub and Shrub Wetlands	612.40	0.96



ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	40,964.04	25.45	52%
10C	Swamps	1,322.21	0.82	2%
10D	Scrub and Shrub Wetlands	114.01	0.07	< 1%
9B	Vegetated Low Banks	27,218.10	16.91	35%
8B	Sheltered, Solid Man-Made Structures	2,734.39	1.70	4%
8C	Sheltered Riprap	1,387.01	0.86	2%
6B	Riprap	1,928.81	1.20	2%
4	Coarse Grained Sand Beaches	1,039.74	0.65	1%
3B	Scarps and Steep Slopes (Sand)	938.50	0.58	1%
1B	Exposed, Solid Man-Made Structures	391.46	0.24	1%

Total ESI Shoreline: 78,038.27 Total ESI Shoreline: 48.49
Total Shoreline: 73,314.13 Total Shoreline: 45.56

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 61C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
126	Wading	Great blue heron	Nesting		3 Nests													Feb-Jun	-	-	-
188	Wading	Great blue heron	Nesting		24 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting		Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting		Present													Mar-Aug	-	-	Jul-Aug
798	Raptor	Bald eagle	Nesting		1 Nest													Dec-Jun	-	-	-
910	Waterfowl	Blue-winged teal	Migration		10S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering		100S													-	-	-	-
	Waterfowl	Canvasback	Wintering		100S													-	-	-	-
	Waterfowl	Gadwall	Wintering		10S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering		10S													-	-	-	-
	Waterfowl	Mergansers	Wintering		10S													-	-	-	-
	Waterfowl	Scaup	Wintering		100S													-	-	-	-
	Waterfowl	Snow goose	Wintering		Present													-	-	-	-
923	Waterfowl	Canvasback	Wintering		100S													-	-	-	-
	Waterfowl	Redhead	Wintering		10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering		100S													-	-	-	-
	Waterfowl	Scaup	Wintering		10S													-	-	-	-
965	Waterfowl	Canada goose	Wintering		1,000S													-	-	-	-
	Waterfowl	Tundra swan	Wintering		Present													-	-	-	-



FISH

Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
1614	Diadromous	Alewife	Nursery Area		-													-	-	Feb-Apr	Apr-Oct	Feb-Apr
	Diadromous	American shad	Nursery Area		-													-	-	Mar-Jul	Mar-Oct	Feb-Jun
	Diadromous	Blueback herring	Nursery Area		-													-	-	Apr-Jun	May-Oct	Mar-Jun

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
1834	Crab	Blue crab	Concentration Area		Highly Abundant-Wint													-	-	-	Dec-Mar	Dec-Mar


BIRDS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			10S													-	-	-	-
		Grebes			Present													-	-	-	-
		Red-throated loon			10S													-	-	-	-
	Waterfowl	American black duck			10S													-	-	-	-
		Brant			10S													-	-	-	-
		Bufflehead			1,000S													-	-	-	-
		Canada goose			10,000S													-	-	-	-
		Canvasback			1,000S													-	-	-	-
		Long-tailed duck			10S													-	-	-	-
		Mallard			100S													-	-	-	-
		Mergansers			1,000S													-	-	-	-
		Ruddy duck			1,000S													-	-	-	-
		Scaup			1,000S													-	-	-	-
		Scoters			100S													-	-	-	-
		Tundra swan			100S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Alewife			-													-	-	-	Aug-Nov	Feb-Apr
		American shad			-													-	-	-	Aug-Nov	Feb-Jun
		Atlantic sturgeon	-/E	E	-													-	-	-	-	Jan-Dec
		Atlantic sturgeon	-/E	E	-													-	-	-	-	Jan-Dec
		Blueback herring			-													-	-	-	-	Jun-Nov
		Hickory shad			-													-	-	-	Aug-Nov	Mar-Jun
		Shortnose sturgeon	E/E	E	-													-	-	-	Jun-Sep	Feb-May
		Striped bass			-													-	-	Mar-May	Jan-Dec	Jan-Dec

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle	Green sea turtle	T/T	T	Common													-	-	-	Jul-Oct	-
		Green sea turtle	T/T	T	Rare													-	-	-	May-Dec*	-

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Crab	Blue crab			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct
		Blue crab			Highly Abundant													-	-	-	Jun-Mar*	Jun-Mar*

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
			S	F	J	F	M	A	M	J	J	A	S	O	N	D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
Manatee	West Indian manatee	General Distribution	-/E	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican													-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-
Gull/Tern	Gulls													-	-	-	-
	Terns													-	-	-	-
Waterfowl	Wood duck													Apr-Jul	-	-	Jul-Aug




FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Spot													-	-	-	-	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Nov-Apr	Apr-Dec
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
Marine Benthic	Northern searobin													-	-	-	-	Apr-Sep
	Spotted hake													-	-	-	Dec-Jun	Dec-Jun
Marine Pelagic	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diamondback terrapin													May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	White shrimp													-	-	-	May-Oct	May-Oct

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	465.54	0.73
10B	Freshwater Marshes	24.88	0.04
10C	Swamps	853.68	1.33
10D	Scrub and Shrub Wetlands	356.46	0.56
7	Exposed Tidal Flats	6.76	0.01

ESI SHORELINE HABITAT TYPES

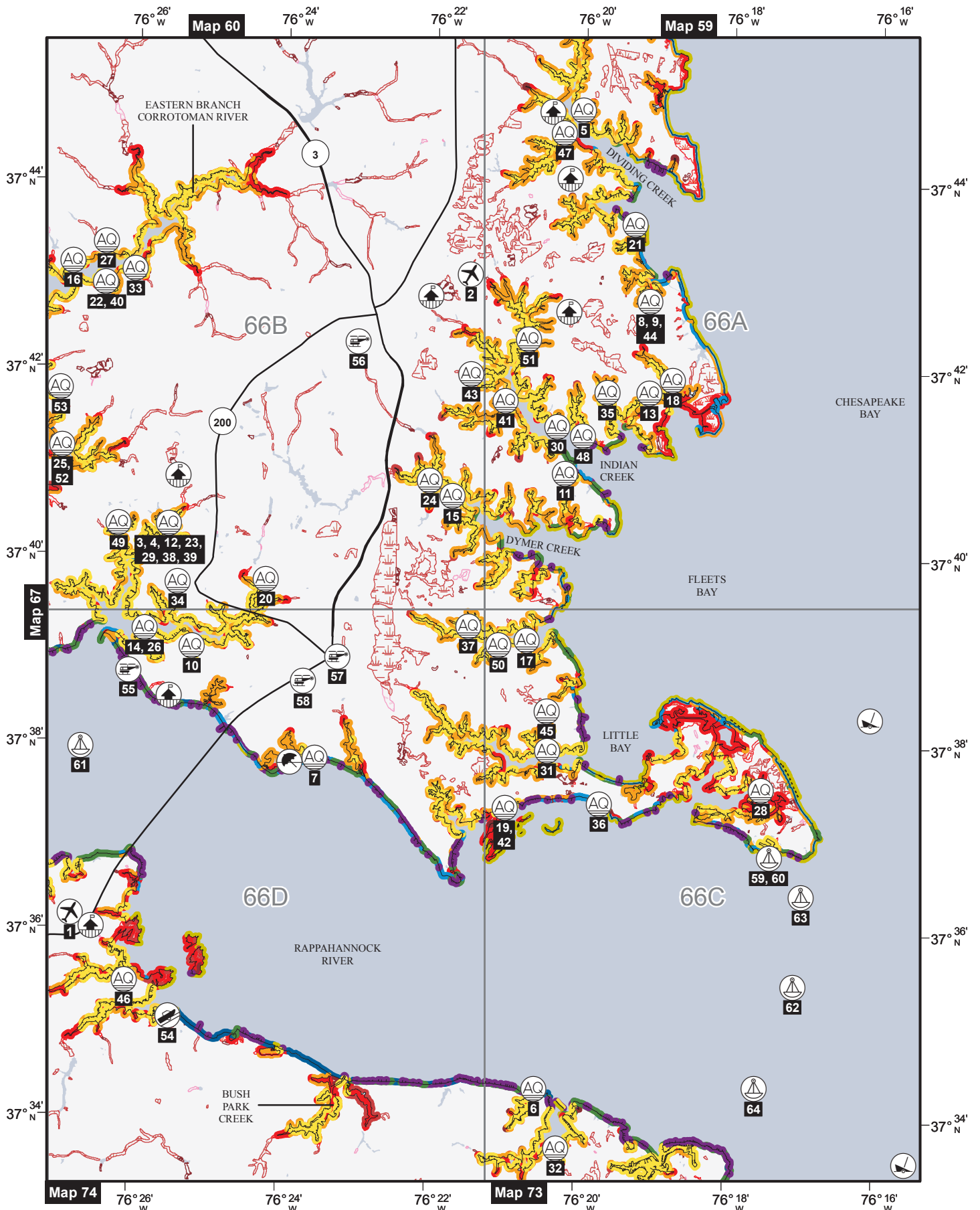
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	40,136.87	24.94	41%
10B	Freshwater Marshes	142.03	0.09	< 1%
10C	Swamps	768.87	0.48	1%
10D	Scrub and Shrub Wetlands	486.36	0.30	< 1%
9A	Sheltered Tidal Flats	1,817.24	1.13	2%
9B	Vegetated Low Banks	23,850.57	14.82	24%
8B	Sheltered, Solid Man-Made Structures	5,545.13	3.45	6%
8C	Sheltered Riprap	1,521.09	0.95	2%
7	Exposed Tidal Flats	121.16	0.08	< 1%
6B	Riprap	7,873.07	4.89	8%
4	Coarse Grained Sand Beaches	6,465.56	4.02	7%
3B	Scarps and Steep Slopes (Sand)	1,462.87	0.91	1%
1B	Exposed, Solid Man-Made Structures	7,352.11	4.57	8%

Total ESI Shoreline: 97,542.94 Total ESI Shoreline: 60.61
 Total Shoreline: 83,141.12 Total Shoreline: 51.66

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 66
Central Bay



SEE BACK OF MAP
for details about mapped resources and
other resources that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 2 Miles
0 2 Kilometers

1:100,000



Map 66
Central Bay

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				Contact	Phone
Map ID	Type	Name			
1	AIRPORT	HUMMEL FIELD			
2	AIRPORT	LONGBRANCH			
3	AQUACULTURE	OYSTER COMMERCIAL SPECK RF#001950		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
4	AQUACULTURE	OYSTER NON-COMM BAILEY RF#001852		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	AQUACULTURE	OYSTER NON-COMM BATTISTA RF#00-1849		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
6	AQUACULTURE	OYSTER NON-COMM BERRY, FREDERIC A. RF#99-0692		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
7	AQUACULTURE	OYSTER NON-COMM BOOKER RF#99-1528		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
8	AQUACULTURE	OYSTER NON-COMM BRAUER, JOHN L. RF#98-0802		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
9	AQUACULTURE	OYSTER NON-COMM BUTLER, ROBERT W. RF#98-0777		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
10	AQUACULTURE	OYSTER NON-COMM CALKINS RF#001978		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
11	AQUACULTURE	OYSTER NON-COMM CARDWELL, JOHN RF#99-1922		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
12	AQUACULTURE	OYSTER NON-COMM CHAMPLAIN, O.S. RF#98-1706		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
13	AQUACULTURE	OYSTER NON-COMM CHES BAY GOVERNOR'S RF#99-2002		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
14	AQUACULTURE	OYSTER NON-COMM CONSTANTINE RF#98-2186		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
15	AQUACULTURE	OYSTER NON-COMM CORNWELL, JERRY A, JR. RF#98-1191		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
16	AQUACULTURE	OYSTER NON-COMM CRICHTON, GEORGE F. RF#98-1705		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
17	AQUACULTURE	OYSTER NON-COMM DEEVER RF#02-0215		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
18	AQUACULTURE	OYSTER NON-COMM DOUMAR RF#01-1152		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
19	AQUACULTURE	OYSTER NON-COMM DUFFER RF#990426		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
20	AQUACULTURE	OYSTER NON-COMM FUNKHOUSER, RAYMOND RF#98-1499		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
21	AQUACULTURE	OYSTER NON-COMM GARY, ROBERT L. RF#98-1081		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
22	AQUACULTURE	OYSTER NON-COMM HAMILTON, RUTH P. RF#98-2041		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
23	AQUACULTURE	OYSTER NON-COMM HAYES RF#002117		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
24	AQUACULTURE	OYSTER NON-COMM HERNDON, DAVID RF#99-1819		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
25	AQUACULTURE	OYSTER NON-COMM HUNTER RF#99-1414		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
26	AQUACULTURE	OYSTER NON-COMM HUNTER, LINDA M. RF#99-1383		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
27	AQUACULTURE	OYSTER NON-COMM KUEHLHORN, BERT O. RF#99-0983		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
28	AQUACULTURE	OYSTER NON-COMM LOCKERMAN RF#00-0722		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
29	AQUACULTURE	OYSTER NON-COMM LYNCH RF#002121		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
30	AQUACULTURE	OYSTER NON-COMM MAPES RF#01-0676		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
31	AQUACULTURE	OYSTER NON-COMM MCLEAN, DONALD RF#99-2098		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
32	AQUACULTURE	OYSTER NON-COMM MORRIS RF#99-1743		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
33	AQUACULTURE	OYSTER NON-COMM NOTHWANGER RF#001666		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
34	AQUACULTURE	OYSTER NON-COMM ORR, MARSHALL RF#98-1792		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
35	AQUACULTURE	OYSTER NON-COMM PORTER RF#00-2093		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
36	AQUACULTURE	OYSTER NON-COMM RHODE RF#991440		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
37	AQUACULTURE	OYSTER NON-COMM SCOTT, NORMAN RF#01-0152		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
38	AQUACULTURE	OYSTER NON-COMM SHUMADINE, WILL RF#00-0340		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
39	AQUACULTURE	OYSTER NON-COMM SMILEY RF#001896		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
40	AQUACULTURE	OYSTER NON-COMM SMITH, DOUGLAS A. RF#98-1624		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254

DISPLAYED ON MAP (POINTS) (continued)

Map ID	Type	Name	Contact	Phone
41	AQUACULTURE	OYSTER NON-COMM STEBBINS RF#00-1732	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
42	AQUACULTURE	OYSTER NON-COMM STEIN RF#001644	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
43	AQUACULTURE	OYSTER NON-COMM SUTPHEN RF#001880	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
44	AQUACULTURE	OYSTER NON-COMM TEEPLES, THOMAS C. RF#98-0828	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
45	AQUACULTURE	OYSTER NON-COMM TOWNES, JOHN M., III RF#99-0974	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
46	AQUACULTURE	OYSTER NON-COMM VIMS RF#99-1654	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
47	AQUACULTURE	OYSTER NON-COMM WALKER, DOUGLAS RF#99-1763	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
48	AQUACULTURE	OYSTER NON-COMM WALKER, HOWARD P. RF#01-1764	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
49	AQUACULTURE	OYSTER NON-COMM WICK, JOHN H., III RF#98-1809	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
50	AQUACULTURE	OYSTER NON-COMM WILLETT RF#99-2097	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
51	AQUACULTURE	OYSTER NON-COMM WILSON, DAVID RF#98-0895	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
52	AQUACULTURE	OYSTER NON-COMM WINELAND RF#99-1731	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
53	AQUACULTURE	OYSTER NON-COMM WINTER RF#99-0693	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
54	BOAT RAMP	MILL CREEK	LENE PENNINGTON, VDGIF	804-367-0058
55	HELIPORT	NICHOLS		
56	HELIPORT	RAPPAHANNOCK GENERAL HOSPITAL		
57	HELIPORT	WHITE STONE		
58	HELIPORT	WHITE STONE FAMILY PRACTICE		
59	REPEATED MEASUREMENT SITE	DB - NOS, 8636580 - WINDMILL POINT, VA	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
60	REPEATED MEASUREMENT SITE	PORTS - WINDMILL POINT, RAPPAHANNOCK RIVER	PORTS PROGRAM	301-713-4392
61	REPEATED MEASUREMENT SITE	WQ - STATION LE3.4	CHESAPEAKE BAY PROGRAM	800-968-7229
62	REPEATED MEASUREMENT SITE	WQ - STATION LE3.6	CHESAPEAKE BAY PROGRAM	800-968-7229
63	REPEATED MEASUREMENT SITE	WQ - STATION LE3.6N	CHESAPEAKE BAY PROGRAM	800-968-7229
64	REPEATED MEASUREMENT SITE	WQ - STATION LE3.6S	CHESAPEAKE BAY PROGRAM	800-968-7229

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
STATE PROTECTED AREA	BLUE CRAB SANCTUARY	VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200
STATE PROTECTED AREA	HUGHLETT POINT	VA DEPT OF CONSERVATION AND RECREATION	

JURISDICTIONS

COUNTY: LANCASTER COUNTY, MIDDLESEX COUNTY, NORTHUMBERLAND COUNTY
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, NORFOLK DISTRICT

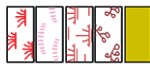
FEMA:
EPA:

REGION I
 REGION 3

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	811.73	1.27
10B	Freshwater Marshes	74.06	0.12
10C	Swamps	1,731.73	2.71
10D	Scrub and Shrub Wetlands	255.72	0.40
7	Exposed Tidal Flats	8.75	0.01



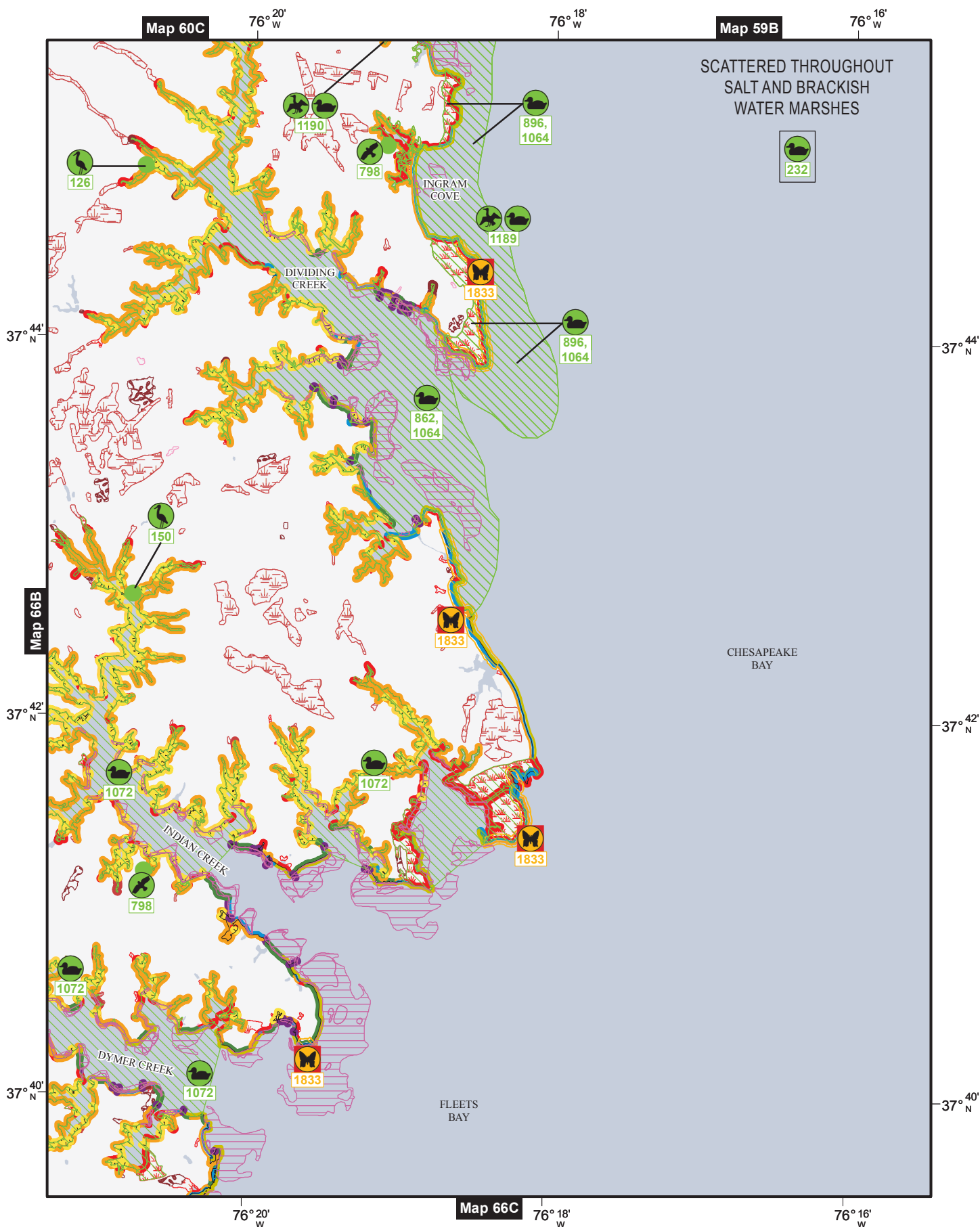
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	148,433.48	92.23	22%
10C	Swamps	7,374.06	4.58	1%
10D	Scrub and Shrub Wetlands	2,815.21	1.75	< 1%
9A	Sheltered Tidal Flats	3,178.02	1.97	< 1%
9B	Vegetated Low Banks	226,201.07	140.56	33%
8B	Sheltered, Solid Man-Made Structures	83,476.46	51.87	12%
8C	Sheltered Riprap	61,287.72	38.08	9%
7	Exposed Tidal Flats	47,591.95	29.57	7%
6B	Riprap	34,383.00	21.36	5%
4	Coarse Grained Sand Beaches	35,907.56	22.31	5%
3A	Fine to Medium Grained Sand Beaches	7,006.48	4.35	1%
3B	Scarps and Steep Slopes (Sand)	2,758.45	1.71	< 1%
1B	Exposed, Solid Man-Made Structures	15,692.62	9.75	2%
Total ESI Shoreline:		676,106.10	420.11	
Total Shoreline:		529,114.80	328.78	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

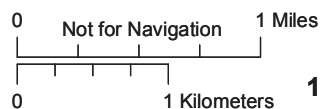




Map 66A
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



Map 66A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value			High												
SAV	Submerged aquatic veg	High Ecological Value			Low												

BIRDS




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
126	Wading	Great blue heron	Nesting			3 Nests													Feb-Jun	-	-	-
150	Wading	Great blue heron	Nesting			10 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
798	Raptor	Bald eagle	Nesting			1 Nest													Dec-Jun	-	-	-
862	Waterfowl	American black duck	Wintering			10S													-	-	-	-
	Waterfowl	Canada goose	Wintering			100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering			10S													-	-	-	-
896	Waterfowl	American wigeon	Wintering			10S													-	-	-	-
	Waterfowl	Canvasback	Wintering			100S													-	-	-	-
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-	-
	Waterfowl	Redhead	Wintering			Present													-	-	-	-
1064	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-
1072	Waterfowl	American black duck	Wintering			10S													-	-	-	-
1189	Diving	D. crested cormorant	Wintering			100S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering			10S													-	-	-	-
	Waterfowl	Scoters	Wintering			10S													-	-	-	-
1190	Diving	D. crested cormorant	Wintering			100S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering			10S													-	-	-	-
	Waterfowl	American wigeon	Wintering			10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-
	Waterfowl	Canvasback	Wintering			100S													-	-	-	-
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-	-
	Waterfowl	Redhead	Wintering			Present													-	-	-	-
	Waterfowl	Scoters	Wintering			10S													-	-	-	-

INVERTEBRATES




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-													Jun-Aug	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			Present													-	-	-	-
		Common loon			100S													-	-	-	-
		D. crested cormorant			1,000S													-	Mar-May	Aug-Nov	-
		Grebes			100S													-	-	-	-
		Grebes			Present													-	-	-	-
		Red-throated loon			10S													-	-	-	-
	Pelagic	Red-throated loon			100S													-	-	-	-
		Northern gannet			100S													-	-	-	-
		American black duck			100S													-	-	-	-
		Bufflehead			1,000S													-	-	-	-
		Canada goose			1,000S													-	-	-	-
		Canvasback			10S													-	-	-	-
		Long-tailed duck			100S													-	-	-	-
		Long-tailed duck			10S													-	-	-	-
		Mallard			10S													-	-	-	-
		Mergansers			10S													-	-	-	-
		Ring-necked duck			10S													-	-	-	-
		Ruddy duck			100S													-	-	-	-
		Scaup			100S													-	-	-	-
		Scoters			10,000S													-	-	-	-
		Scoters			1,000S													-	-	-	-
		Tundra swan			100S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Alewife			-													-	-	-	Aug-Nov	Feb-Apr
		American shad			-													-	-	-	Aug-Nov	Feb-Jun
		Atlantic sturgeon			-													-	-	-	-	Jan-Dec
		Blueback herring			-													-	-	-	Aug-Nov	Mar-Jun
		Hickory shad			-													-	-	-	Jun-Sep	Feb-May
		Shortnose sturgeon			-													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	Striped bass			-													-	-	-	-	Feb-Jun
		Atl. sharpnose shark			-													-	-	-	Jun-Sep	Jun-Sep
		Sandbar shark			-													-	-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Interest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
	Blue crab	Concentration Area			Highly Abundant-Summ												-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS




Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	West Indian manatee	General Distribution	-/E	E	Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)





BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Storm-petrels													-	-	-	-
	Wood duck													Apr-Jul	-	-	Jul-Aug





FISH

Subelement	Species	Mapping Qualifier	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife														Feb-Apr	Feb-Apr	Feb-Apr	Feb-Apr	Feb-Apr
	American eel														-	-	-	Jan-May	Jan-Dec
	Blueback herring														Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad														Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass														-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker														-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden														-	-	-	Jan-Dec	Jan-Dec
	Black drum														Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass														-	-	-	Apr-Nov	Apr-Nov
	Bluefish														-	-	-	May-Oct	May-Oct
	Kingfishes														-	-	-	-	Apr-Nov


FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	Mar-Oct	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	-	Apr-Nov
	Spotted seatrout													May-Jul	-	-	Nov-Apr	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleamose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

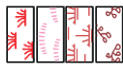
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	273.39	0.43
10B	Freshwater Marshes	2.90	0.00
10C	Swamps	431.10	0.67
10D	Scrub and Shrub Wetlands	50.99	0.08



ESI SHORELINE HABITAT TYPES

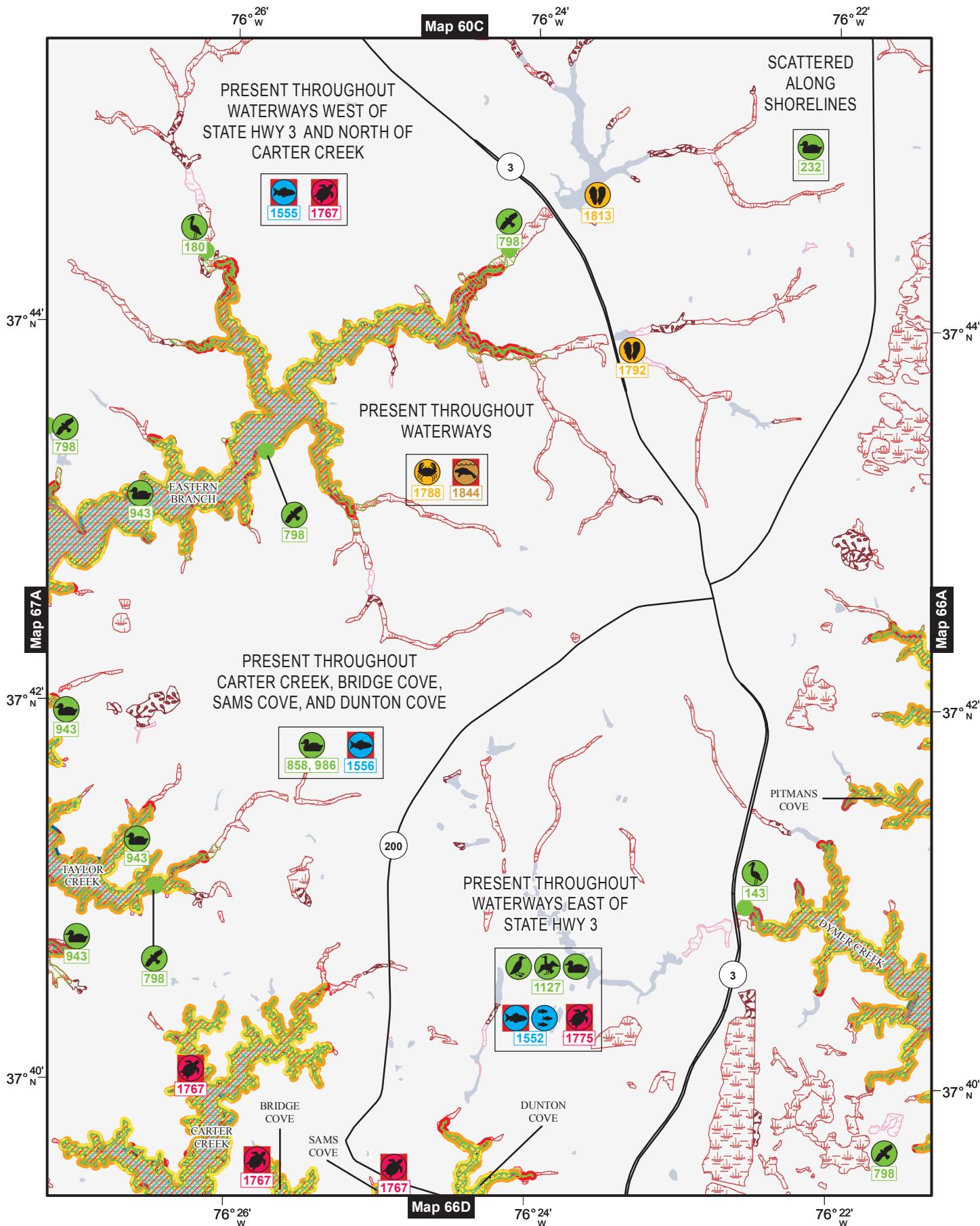
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	35,230.88	21.89	17%
10C	Swamps	1,045.65	0.65	1%
10D	Scrub and Shrub Wetlands	660.41	0.41	< 1%
9A	Sheltered Tidal Flats	1,856.42	1.15	1%
9B	Vegetated Low Banks	79,424.99	49.35	38%
8B	Sheltered, Solid Man-Made Structures	19,361.20	12.03	9%
8C	Sheltered Riprap	25,195.13	15.66	12%
7	Exposed Tidal Flats	18,652.84	11.59	9%
6B	Riprap	8,709.23	5.41	4%
4	Coarse Grained Sand Beaches	13,594.38	8.45	7%
3A	Fine to Medium Grained Sand Beaches	25.02	0.02	< 1%
3B	Scarps and Steep Slopes (Sand)	363.75	0.23	< 1%
1B	Exposed, Solid Man-Made Structures	2,530.82	1.57	1%

Total ESI Shoreline: 206,650.73 Total ESI Shoreline: 128.41
 Total Shoreline: 160,556.85 Total Shoreline: 99.77

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 66B
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA	Monthly Presence											
				S	F	Concentration	J	F	M	A	M	J	J	A	S
SAV	Submerged aquatic veg	High Ecological Value				Ephemeral									

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	J	F	M	A	M	J	J	A	S	N	D	Nest	Mig.(S)	Mig.(F)	Molt
143	Wading	Great blue heron	Nesting				7 Nests												Feb-Jun	-	-	-
180	Wading	Great blue heron	Nesting				12 Nests												Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting				Present												Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present												Mar-Aug	-	-	Jul-Aug
798	Raptor	Bald eagle	Nesting				1 Nest												Dec-Jun	-	-	-
858	Waterfowl	Canada goose	Wintering				100S												-	-	-	-
	Waterfowl	Ruddy duck	Wintering				10S												-	-	-	-
	Waterfowl	Scaup	Wintering				10S												-	-	-	-
943	Waterfowl	American black duck	Wintering				10S												-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S												-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S												-	-	-	-
	Waterfowl	Gadwall	Wintering				Present												-	-	-	-
	Waterfowl	Mallard	Wintering				10S												-	-	-	-
	Waterfowl	Mergansers	Wintering				100S												-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S												-	-	-	-
	Waterfowl	Scaup	Wintering				100S												-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S												-	-	-	-
986	Waterfowl	Bufflehead	Wintering				100S												-	-	-	-
	Waterfowl	Mallard	Wintering				10S												-	-	-	-
1127	Diving	Common loon	Wintering				Present												-	-	-	-
	Diving	Grebes	Wintering				Present												-	-	-	-
	Diving	Red-throated loon	Wintering				10S												-	-	-	-
	Pelagic	Northern gannet	Wintering				100S												-	-	-	-
	Waterfowl	American black duck	Wintering				10S												-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S												-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S												-	-	-	-
	Waterfowl	Canvasback	Wintering				10S												-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				10S												-	-	-	-
	Waterfowl	Mallard	Wintering				10S												-	-	-	-
	Waterfowl	Mergansers	Wintering				10S												-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				10S												-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S												-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Waterfowl	Scaup	Wintering			100S													-	-	-
	Waterfowl	Scoters	Wintering			1,000S													-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1552	Diadromous	Alewife	Migration			-													-	-	-	Feb-Apr	
	Diadromous	American shad	Migration			-													-	-	-	Feb-Jun	
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec	
	Diadromous	Blueback herring	Migration			-													-	-	-	Mar-Jun	
	Diadromous	Hickory shad	Migration			-													-	-	-	Feb-May	
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	
	Diadromous	Striped bass	Migration			-													-	-	-	Feb-Jun	
	Estuarine Nursery	Atl. sharpnose shark	Nursery Area			-													-	-	-	Jun-Sep	
1555	Marine Pelagic	Sandbar shark	Nursery Area			-													-	-	-	May-Sep	
	Diadromous	Alewife	Migration			-													-	-	-	Feb-Apr	
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec	
	Diadromous	Blueback herring	Migration			-													-	-	-	Mar-Jun	
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	
	Diadromous	Striped bass	Nursery Area			-													-	-	-	Jan-Dec	
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec	
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	
1556	Diadromous	Striped bass	Nursery Area			-													-	-	-	Jan-Dec	
	Diadromous	Atlantic sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	
	Diadromous	Striped bass	Nursery Area			-													-	-	-	Jan-Dec	

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1767	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	May-Dec*	-	
	Turtle	Green sea turtle	General Distribution	T/T	T	Common													-	-	Jul-Oct	-	
1775	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	Apr-Oct	-	
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	Nov-Dec	-	
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	Nov-Dec	Nov-Dec	
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	Apr-Oct	Apr-Oct	

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier General Distribution	MD/VA S F -/E E	Monthly Presence												Mating	Calving	Pupping	Molt
					J	F	M	A	M	J	J	A	S	O	N	D				

1844	Manatee	West Indian manatee															-	-	-	-
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ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				

	Diving	Brown pelican												-	-	-	-
		D. crested cormorant												-	Mar-May	Aug-Nov	-
	Gull/Tern	Gulls												-	-	-	-
		Terns												-	-	-	-
	Waterfowl	Wood duck												Apr-Jul	-	-	Jul-Aug



FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					





	Diadromous	Alewife												Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
		American eel												Mar-Jun	Mar-Jun	Apr-Jun	Jan-May	Jan-Dec
		Blueback herring												Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
		Gizzard shad												Mar-Jun	Mar-Jun	Apr-Jun	Jan-Dec	Jan-Dec
		Striped bass												-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	Atlantic croaker												-	-	Apr-Dec	Jan-Dec	May-Oct
		Atlantic croaker												-	-	Dec-Apr	Jan-Dec	May-Nov
		Atlantic herring												-	-	-	-	Jan-Jun
		Atlantic menhaden												-	-	-	Jan-Dec	Jan-Dec
		Black drum												Apr-Jun	Apr-Jun	-	Apr-Dec	Apr-Dec
		Black sea bass												-	-	-	Apr-Nov	Apr-Nov
		Bluefish												-	-	-	May-Oct	May-Oct
		Kingfishes												-	-	-	-	Apr-Nov
		Northern puffer												-	-	-	Mar-Oct	Mar-Oct
		Northern puffer												-	-	-	Mar-Oct	Mar-Nov
		Pigfish												-	-	-	-	Apr-Nov
		Red drum												-	-	-	-	May-Nov
		Sheepshead												-	-	-	-	Apr-Nov
		Spot												-	-	-	Nov-Apr	Apr-Dec
		Spotted seatrout												May-Jul	-	-	Apr-Nov	Apr-Nov
		Summer flounder												-	-	Feb-May	Apr-Dec	Jan-Dec
		Weakfish												-	-	May-Aug	Jun-Dec	Apr-Dec
		White perch												-	-	-	Jan-Dec	Jan-Dec
		Winter flounder												-	-	-	-	Dec-Mar
	Estuarine Resident	Pipefish												-	-	-	Jan-Dec	Jan-Dec
		Silversides												Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Fish	Anchovies												Apr-Sep	-	-	-	Jan-Dec
		Striped burrfish												-	-	-	May-Oct	May-Oct

Central Bay: Map 66B


FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Marine Benthic																	
	Atlantic spadefish																	
	Clearnose skate																	
	Cownose ray																	
	Northern searobin																	
	Northern searobin																	
	Red hake																	
	Silver hake																	
	Spotted hake																	
	Butterfish																	
	Cobia																	
	Harvestfish																	
	Lined seahorse																	
	Spanish mackerel																	

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve																	
	Eastern oyster																	
	Softshell clam																	
	Cephalopod																	
	Stout razor clam																	
	Squid																	
	Crab																	
	Blue crab																	
	Horseshoe crab																	
	Shrimp																	
	Brown shrimp																	
	Mantis shrimp																	
	White shrimp																	

MARINE MAMMALS

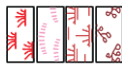
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin																
	Bottlenose dolphin																
	Bottlenose dolphin																
	Harbor porpoise																

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	118.64	0.19
10B	Freshwater Marshes	45.73	0.07
10C	Swamps	831.65	1.30
10D	Scrub and Shrub Wetlands	143.21	0.22



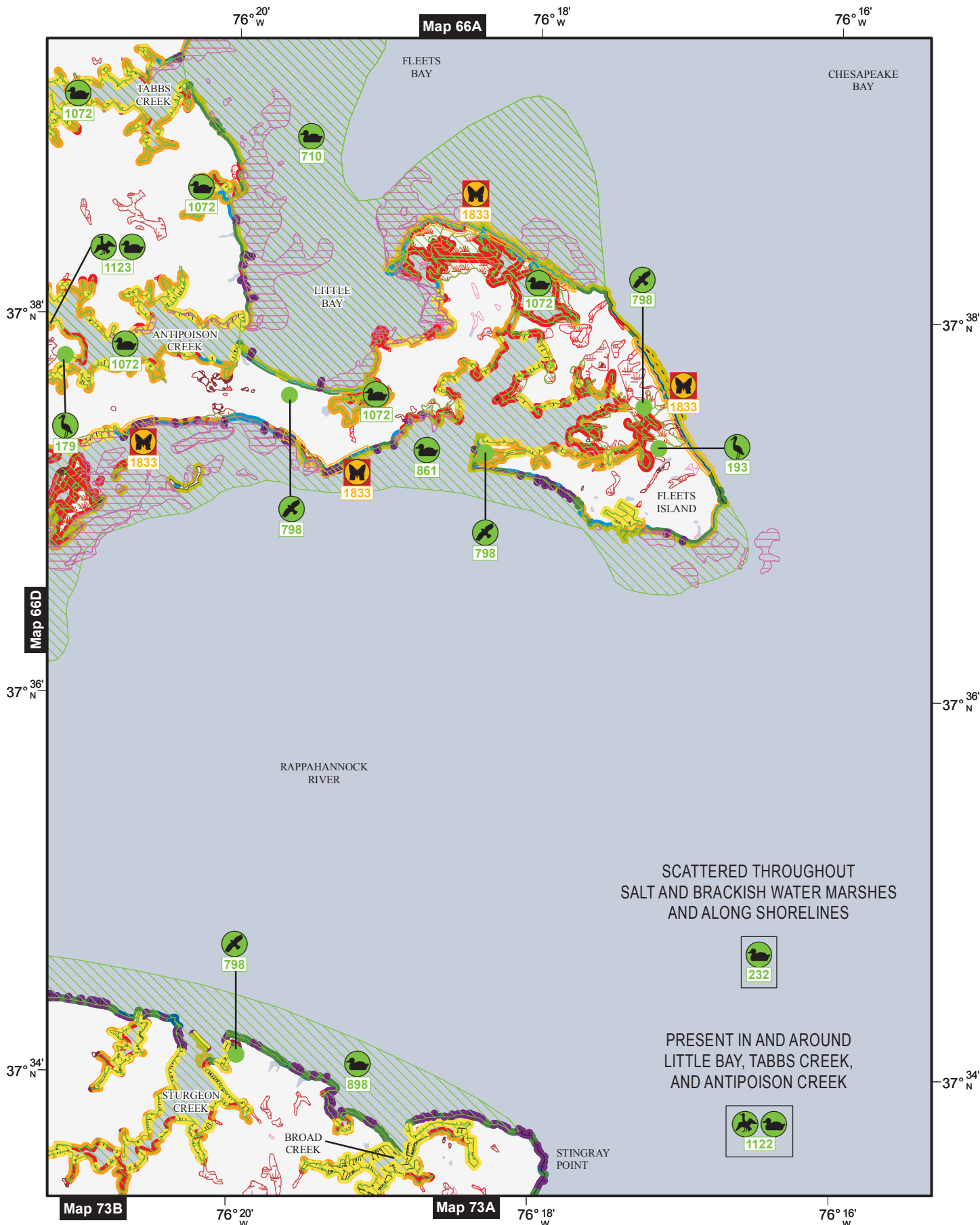
ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	17,448.46	10.84	15%
10C	Swamps	1,584.43	0.98	1%
10D	Scrub and Shrub Wetlands	248.57	0.15	< 1%
9B	Vegetated Low Banks	54,574.12	33.91	48%
8B	Sheltered, Solid Man-Made Structures	22,651.55	14.08	20%
8C	Sheltered Riprap	16,499.28	10.25	14%
6B	Riprap	322.19	0.20	< 1%
4	Coarse Grained Sand Beaches	541.29	0.34	< 1%
3B	Scarps and Steep Slopes (Sand)	474.18	0.29	< 1%
Total ESI Shoreline:		114,344.07	71.05	
Total Shoreline:		108,158.04	67.21	

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

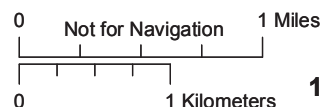




Map 66C
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



Map 66C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value		Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value		High												
SAV	Submerged aquatic veg	High Ecological Value		Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence										Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N			
179	Wading	Great blue heron	Nesting		26 Nests														Feb-Jun
193	Wading	Great blue heron	Nesting		47 Nests														Feb-Jun
232	Waterfowl	Canada goose	Nesting		Present														Mar-Aug
	Waterfowl	Mallard	Nesting		Present														Mar-Aug
710	Waterfowl	American black duck	Wintering		100S														-
798	Raptor	Bald eagle	Nesting		1 Nest														Dec-Jun
861	Waterfowl	American black duck	Wintering		Present														-
	Waterfowl	Bufflehead	Wintering		100S														-
	Waterfowl	Canada goose	Wintering		100S														-
	Waterfowl	Canvasback	Wintering		100S														-
	Waterfowl	Common goldeneye	Wintering		Present														-
	Waterfowl	Tundra swan	Wintering		10S														-
898	Waterfowl	American black duck	Wintering		10S														-
	Waterfowl	Bufflehead	Wintering		100S														-
	Waterfowl	Canvasback	Wintering		100S														-
	Waterfowl	Gadwall	Wintering		Present														-
	Waterfowl	Mallard	Wintering		100S														-
	Waterfowl	Ruddy duck	Wintering		1,000S														-
	Waterfowl	Tundra swan	Wintering		10S														-
1072	Waterfowl	American black duck	Wintering		10S														-
1122	Diving	Red-throated loon	Wintering		10S														-
	Waterfowl	Bufflehead	Wintering		1,000S														-
	Waterfowl	Canvasback	Wintering		10S														-
	Waterfowl	Long-tailed duck	Wintering		10S														-
	Waterfowl	Ring-necked duck	Wintering		10S														-
	Waterfowl	Scoters	Wintering		1,000S														-
	Waterfowl	Tundra swan	Wintering		100S														-
1123	Diving	Red-throated loon	Wintering		10S														-
	Waterfowl	American black duck	Wintering		10S														-
	Waterfowl	Bufflehead	Wintering		1,000S														-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Waterfowl	Canvasback	Wintering			10S												-	-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S												-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S												-	-	-	-	-
	Waterfowl	Scoters	Wintering			1,000S												-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S												-	-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-												Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)



BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Eggs	Larvae	Juveniles	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Diving	Common loon	Wintering			100S												-	-	-	-	-
		Common loon	Wintering			Present												-	-	-	-	-
		D. crested cormorant	Wintering			1,000S												-	Mar-May	Aug-Nov	-	-
		D. crested cormorant	Wintering			100S												-	Mar-May	Aug-Nov	-	-
		Grebes	Wintering			100S												-	-	-	-	-
		Grebes	Wintering			10S												-	-	-	-	-
		Grebes	Wintering			Present												-	-	-	-	-
		Red-throated loon	Wintering			100S												-	-	-	-	-
		Red-throated loon	Wintering			Present												-	-	-	-	-
	Pelagic	Northern gannet	Wintering			100S												-	-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S												-	-	-	-	-
		Long-tailed duck	Wintering			100S												-	-	-	-	-
		Mallard	Wintering			10S												-	-	-	-	-
		Mergansers	Wintering			10S												-	-	-	-	-
		Ruddy duck	Wintering			100S												-	-	-	-	-
		Scaup	Wintering			100S												-	-	-	-	-
		Scoters	Wintering			100S												-	-	-	-	-
		Scoters	Wintering			10,000S												-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Diadromous	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr
		American shad	Migration			-												-	-	-	Aug-Nov	Feb-Jun
		Atlantic sturgeon	General Distribution	-JE	E	-												-	-	-	-	Jan-Dec
		Atlantic sturgeon	Migration	-JE	E	-												-	-	-	-	Jun-Nov
		Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun
		Hickory shad	Migration			-												-	-	-	Jun-Sep	Feb-May

FISH (continued)

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	Jan-Dec	Jan-Dec
	Striped bass	Migration			-													-	-	-	Feb-Jun
	Striped bass	Nursery Area			-													-	Mar-May	Jan-Dec	-
 Estuarine Nursery	Atl. sharpnose shark	Nursery Area			-													-	-	Jun-Sep	Jun-Sep
 Marine Pelagic	Sandbar shark	Nursery Area			-													-	-	May-Sep	May-Sep


REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
Turtle	Green sea turtle	General Distribution	T/T	T	Common													-	-	Jul-Oct	-
	Green sea turtle	General Distribution	T/T	T	Rare													-	-	May-Dec*	-
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
			S	F		J	F	M	A	M	J	J	A	S	O	N	D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican	General Distribution																-	-	-	-
	Brown pelican	General Distribution																-	-	-	-
	D. crested cormorant	General Distribution																-	-	-	-
	D. crested cormorant	General Distribution																-	Mar-May	Aug-Nov	-
Gull/Tern	Gulls	General Distribution																-	-	-	-
	Terns	General Distribution																-	-	-	-
Pelagic	Storm-petrels	General Distribution																-	-	-	-
	Storm-petrels	General Distribution																-	-	-	-

FISH





Monthly Presence

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D	Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	Alewife													-	-	-	Jan-May	Feb-Apr
	American eel													Mar-Jun	Mar-Jun	Apr-Jun	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	-	-	Jan-Dec	Mar-Jun
	Gizzard shad													-	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Clearnose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													-	-	-	-	Apr-Sep
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep
														-	-	-	-	
														-	-	-	-	



REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diamondback terrapin													May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-
	Harbor seal													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	246.40	0.39
10B	Freshwater Marshes	6.20	0.01
10C	Swamps	111.83	0.17
10D	Scrub and Shrub Wetlands	25.41	0.04
7	Exposed Tidal Flats	6.00	0.01

ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	46,846.12	29.11	26%
10C	Swamps	528.10	0.33	< 1%
10D	Scrub and Shrub Wetlands	934.60	0.58	1%
9A	Sheltered Tidal Flats	215.32	0.13	< 1%
9B	Vegetated Low Banks	41,655.91	25.88	23%
8B	Sheltered, Solid Man-Made Structures	21,638.66	13.45	12%
8C	Sheltered Riprap	7,427.97	4.62	4%
7	Exposed Tidal Flats	23,850.88	14.82	13%
6B	Riprap	15,351.52	9.54	9%
4	Coarse Grained Sand Beaches	14,007.55	8.70	8%
3A	Fine to Medium Grained Sand Beaches	1,485.24	0.92	1%
1B	Exposed, Solid Man-Made Structures	5,385.63	3.35	3%

Total ESI Shoreline: 179,327.51 Total ESI Shoreline: 111.43
 Total Shoreline: 126,512.86 Total Shoreline: 78.61

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 66D
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence											
							J	F	M	A	M	J	J	A	S	O	N	D
SAV	Submerged aquatic veg	High Ecological Value				Ephemeral												
SAV	Submerged aquatic veg	High Ecological Value				High												
SAV	Submerged aquatic veg	High Ecological Value				Low												

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
52	Diving	D. crested cormorant	Wintering				100S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering				10S													-	-	-	-
108	Wading	Great blue heron	Nesting				6 Nests													Feb-Jun	-	-	-
153	Wading	Great blue heron	Nesting				4 Nests													Feb-Jun	-	-	-
169	Wading	Great blue heron	Nesting				15 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
681	Waterfowl	Brant	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering				10,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Mergansers	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				1,000S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
705	Raptor	Peregrine falcon	Nesting				-													Feb-Jun	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
853	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				10S													-	-	-	-
	Waterfowl	Scaup	Wintering				10S													-	-	-	-
1237	Diving	Common loon	Wintering				Present													-	-	-	-
	Diving	Red-throated loon	Wintering				Present													-	-	-	-
	Pelagic	Northern gannet	Wintering				100S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				100S													-	-	-	-
	Waterfowl	Scoters	Wintering				100S													-	-	-	-
1241	Diving	Common loon	Wintering				Present													-	-	-	-
	Pelagic	Northern gannet	Wintering				100S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	Ring-necked duck	Wintering			10S													-	-	-	
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	
	Waterfowl	Scooters	Wintering			1,000S													-	-	-	
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	
1369	Diving	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
	Waterfowl	American black duck	Wintering			Present													-	-	-	-
	Waterfowl	Canada goose	Wintering			100S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering			Present													-	-	-	-
	Waterfowl	Mallard	Wintering			10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1606	Diadromous	Striped bass	Migration			-											-	-	-	Feb-Jun			
	Estuarine Nursery	Atl. sharpnose shark	Nursery Area			-											-	-	-	Jun-Sep			
	Marine Pelagic	Sandbar shark	Nursery Area			-											-	-	-	May-Sep			

REPTILES & AMPHIBIANS



Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
1762	Turtle	Diamondback terrapin	Concentration Area			High													May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults				
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D			
1788	Crab	Blue crab	Concentration Area			Highly Abundant													-	-	-	-	Jun-Oct	Jun-Oct	Jun-Oct	Jun-Aug
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-	-	-											Jun-Aug	Jun-Aug	Jan-Dec	-	-	-	Jun-Aug	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon	Wintering			10S											-	-	-			
		D. crested cormorant	Wintering			100S											-	Mar-May	Aug-Nov	-		
		Grebes	Wintering			Present											-	-	-	-		
		Red-throated loon	Wintering			10S											-	-	-	-		
	Waterfowl	American black duck	Wintering			10S											-	-	-			
		Bufflehead	Wintering			100S											-	-	-			
		Canada goose	Wintering			1,000S											-	-	-			
		Canvasback	Wintering			100S											-	-	-			
		Gadwall	Wintering			Present											-	-	-			
		Long-tailed duck	Wintering			10S											-	-	-			


BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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FISH

<div><div></div><div>Subelement</div></div>	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
<div><div></div><div>Diadromous</div></div>	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr	
	American shad	Migration			-												-	-	-	Aug-Nov	Feb-Jun	
	Atlantic sturgeon	General Distribution	-/E	E	-												-	-	-	-	Jan-Dec	
	Atlantic sturgeon	Migration	-/E	E	-												-	-	-	-	Jun-Nov	
	Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun	
	Hickory shad	Migration			-												-	-	-	Jun-Sep	Feb-May	
	Shortnose sturgeon	General Distribution	E/E	E	-												-	-	-	Jan-Dec	Jan-Dec	
	Striped bass	Nursery Area			-												-	Mar-May	-	Jan-Dec	-	
						-											-	-	-	-	-	

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Green sea turtle	General Distribution	T/T	T	Rare													-	-	May-Dec*	-
	Green sea turtle	General Distribution	T/T	T	Common													-	-	Jul-Oct	-
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	Apr-Oct	-
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	Apr-Oct	Apr-Oct



INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
	Crab	Blue crab	Concentration Area			Highly Abundant												-	-	-	Jun-Mar*	Jun-Mar*
		Blue crab	Concentration Area			Highly Abundant-Wint												-	-	-	Dec-Mar	Dec-Mar






MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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	Manatee	West Indian manatee	General Distribution	-/E	E	Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																


BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Brown pelican													-	-	-	-	-
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	-	Apr-Nov
	Spotted seatrout													May-Jul	-	-	Nov-Apr	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Clearnose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec




FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Spotted hake													-	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Jul-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep


REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diamondback terrapin													May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	173.29	0.27
10B	Freshwater Marshes	19.22	0.03
10C	Swamps	357.16	0.56
10D	Scrub and Shrub Wetlands	36.12	0.06
7	Exposed Tidal Flats	2.75	0.00

ESI SHORELINE HABITAT TYPES

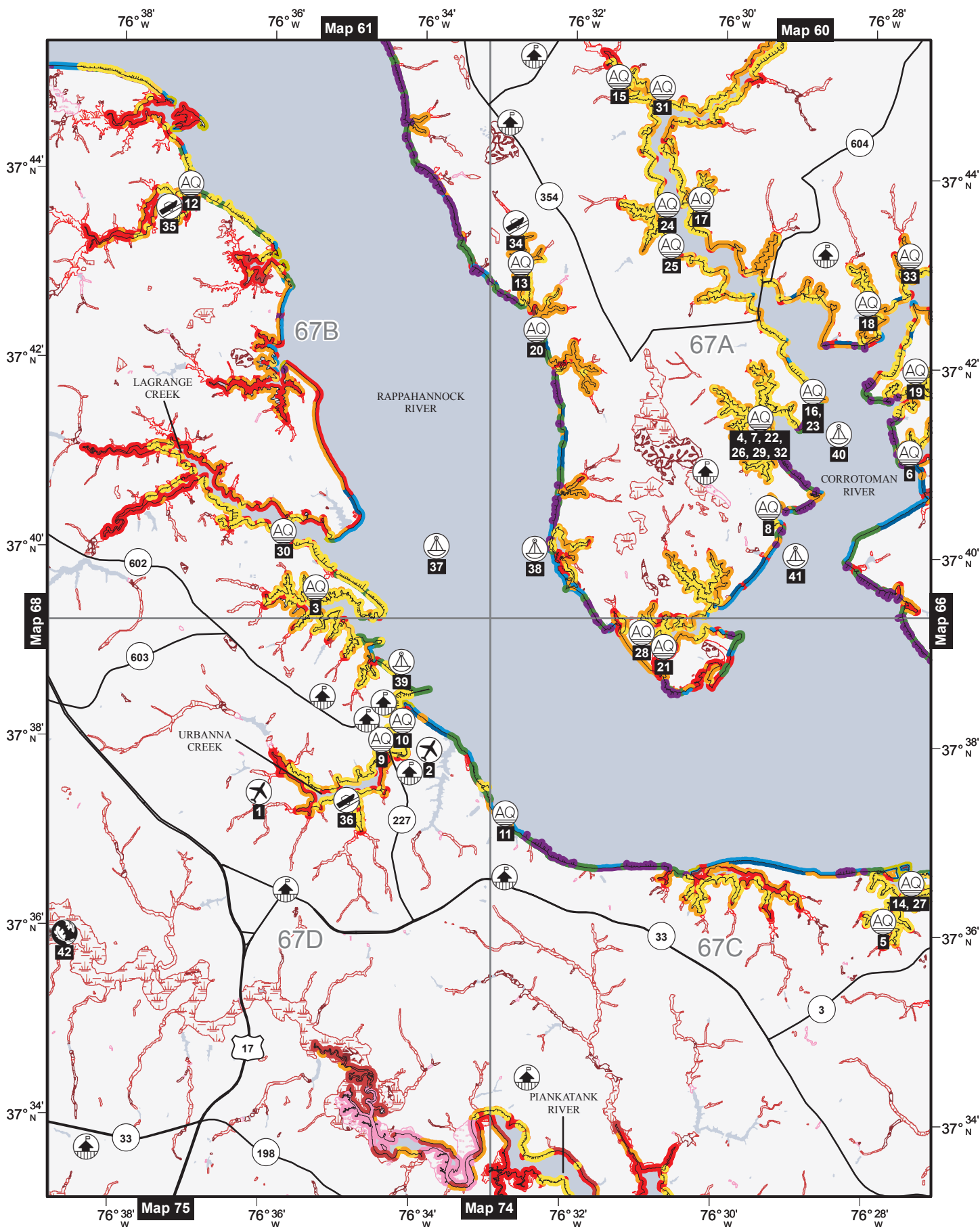
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	48,908.01	30.39	28%
10C	Swamps	4,215.88	2.62	2%
10D	Scrub and Shrub Wetlands	971.63	0.60	1%
9A	Sheltered Tidal Flats	1,106.28	0.69	1%
9B	Vegetated Low Banks	50,546.06	31.41	29%
8B	Sheltered, Solid Man-Made Structures	19,825.05	12.32	11%
8C	Sheltered Riprap	12,165.34	7.56	7%
7	Exposed Tidal Flats	5,088.23	3.16	3%
6B	Riprap	10,000.06	6.21	6%
4	Coarse Grained Sand Beaches	7,764.34	4.82	4%
3A	Fine to Medium Grained Sand Beaches	5,496.21	3.42	3%
3B	Scarps and Steep Slopes (Sand)	1,920.52	1.19	1%
1B	Exposed, Solid Man-Made Structures	7,776.18	4.83	4%

Total ESI Shoreline: 175,783.79 Total ESI Shoreline: 109.23
 Total Shoreline: 133,887.04 Total Shoreline: 83.19

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 67 Central Bay



SEE BACK OF MAP
for details about mapped resources and
other resources that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 2 Miles
0 2 Kilometers

1:100,000



HUMAN USE RESOURCES




DISPLAYED ON MAP (POINTS)				Contact	Phone
Map ID	Type	Name			
1	AIRPORT	ARROWHEAD POINT			
2	AIRPORT	ROSEGILL FARM AIRSTRIP			
3	AQUACULTURE	CRAB SHED SHORES AND RUARK SEAFOOD	RF#98-0545	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
4	AQUACULTURE	OYSTER COMMERCIAL MARTIN	RF#98-1768	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	AQUACULTURE	OYSTER NON-COMM ANDERSON, DAREL	RF#2001-1692	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
6	AQUACULTURE	OYSTER NON-COMM BEARD	RF#98-0891	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
7	AQUACULTURE	OYSTER NON-COMM BIGFORD	RF#002176	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
8	AQUACULTURE	OYSTER NON-COMM CATHEY	RF#99-0543	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
9	AQUACULTURE	OYSTER NON-COMM CHES BAY GOV'S SCHOO	RF#99-2001	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
10	AQUACULTURE	OYSTER NON-COMM CHES BAY GOVERNOR'S	RF#20020210	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
11	AQUACULTURE	OYSTER NON-COMM CHRISTCHURCH SCHOOL	RF#99-1181	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
12	AQUACULTURE	OYSTER NON-COMM DAVIS, JERRY B.	RF#98-1147	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
13	AQUACULTURE	OYSTER NON-COMM FERRITER, NICHOLAS	RF#00-0756	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
14	AQUACULTURE	OYSTER NON-COMM FOLKES	RF#99-0605	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
15	AQUACULTURE	OYSTER NON-COMM GREGORY, THOMAS	RF#98-1694	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
16	AQUACULTURE	OYSTER NON-COMM HEARNS, CHARLES B.	RF#98-0832	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
17	AQUACULTURE	OYSTER NON-COMM HENDERSON, GEORGE	RF#98-0907	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
18	AQUACULTURE	OYSTER NON-COMM HOFFMAN, GREG	RF#00-0638	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
19	AQUACULTURE	OYSTER NON-COMM HOLTON	RF#99-1765	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
20	AQUACULTURE	OYSTER NON-COMM HOUCK	RF#99-2031	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
21	AQUACULTURE	OYSTER NON-COMM JACOBI	RF#99-1896	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
22	AQUACULTURE	OYSTER NON-COMM JOHNSON, FREDERICK	RF#01-1965	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
23	AQUACULTURE	OYSTER NON-COMM MATTHEWS, ED	RF#99-1968	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
24	AQUACULTURE	OYSTER NON-COMM PFEIFFER, W. A.	RF#99-1202	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
25	AQUACULTURE	OYSTER NON-COMM RACKEL, E. J.	RF#98-0774	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
26	AQUACULTURE	OYSTER NON-COMM RICHARDSON	RF#991247	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
27	AQUACULTURE	OYSTER NON-COMM ROBERTSON	RF#99-1633	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
28	AQUACULTURE	OYSTER NON-COMM SAVINO	RF#001977	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
29	AQUACULTURE	OYSTER NON-COMM SAWDY	RF#98-1876	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
30	AQUACULTURE	OYSTER NON-COMM SIMON, R.W.	RF#98-1923	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
31	AQUACULTURE	OYSTER NON-COMM THOMPSON, GEORGE E.	RF#99-1945	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
32	AQUACULTURE	OYSTER NON-COMM VETTE, JAMES	RF#01-2014	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
33	AQUACULTURE	OYSTER NON-COMM WEEKLY, ROBERT	RF#98-1023	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
34	BOAT RAMP	GREENVALE CREEK		LENE PENNINGTON, VDGIF	804-367-0058
35	BOAT RAMP	MILL STONE		LENE PENNINGTON, VDGIF	804-367-0058
36	BOAT RAMP	SALUDA		LENE PENNINGTON, VDGIF	804-367-0058
37	REPEATED MEASUREMENT SITE	WQ - STATION LE3.2		CHESAPEAKE BAY PROGRAM	800-968-7229
38	REPEATED MEASUREMENT SITE	WQ - STATION LE3.2N		CHESAPEAKE BAY PROGRAM	800-968-7229
39	REPEATED MEASUREMENT SITE	WQ - STATION LE3.2S		CHESAPEAKE BAY PROGRAM	800-968-7229
40	REPEATED MEASUREMENT SITE	WQ - STATION LE3.3		CHESAPEAKE BAY PROGRAM	800-968-7229















DISPLAYED ON MAP (POINTS) (continued)			
Map ID	Type	Name	Contact
41	REPEATED MEASUREMENT SITE	WQ - STATION LE3.3A	CHESAPEAKE BAY PROGRAM
			800-968-7229

DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Contact
42	NATURE CONSERVANCY	DRAGON RUN	THE NATURE CONSERVANCY
			703-841-5300

JURISDICTIONS			
COUNTY:	GLOUCESTER COUNTY, LANCASTER COUNTY, MIDDLESEX COUNTY		
COAST GUARD:	DISTRICT 5, SECTOR HAMPTON ROADS		
USACE:	NORTH ATLANTIC DIVISION, NORFOLK DISTRICT		
FEMA:	REGION 1		
EPA:	REGION 3		

SHORELINE RESOURCES

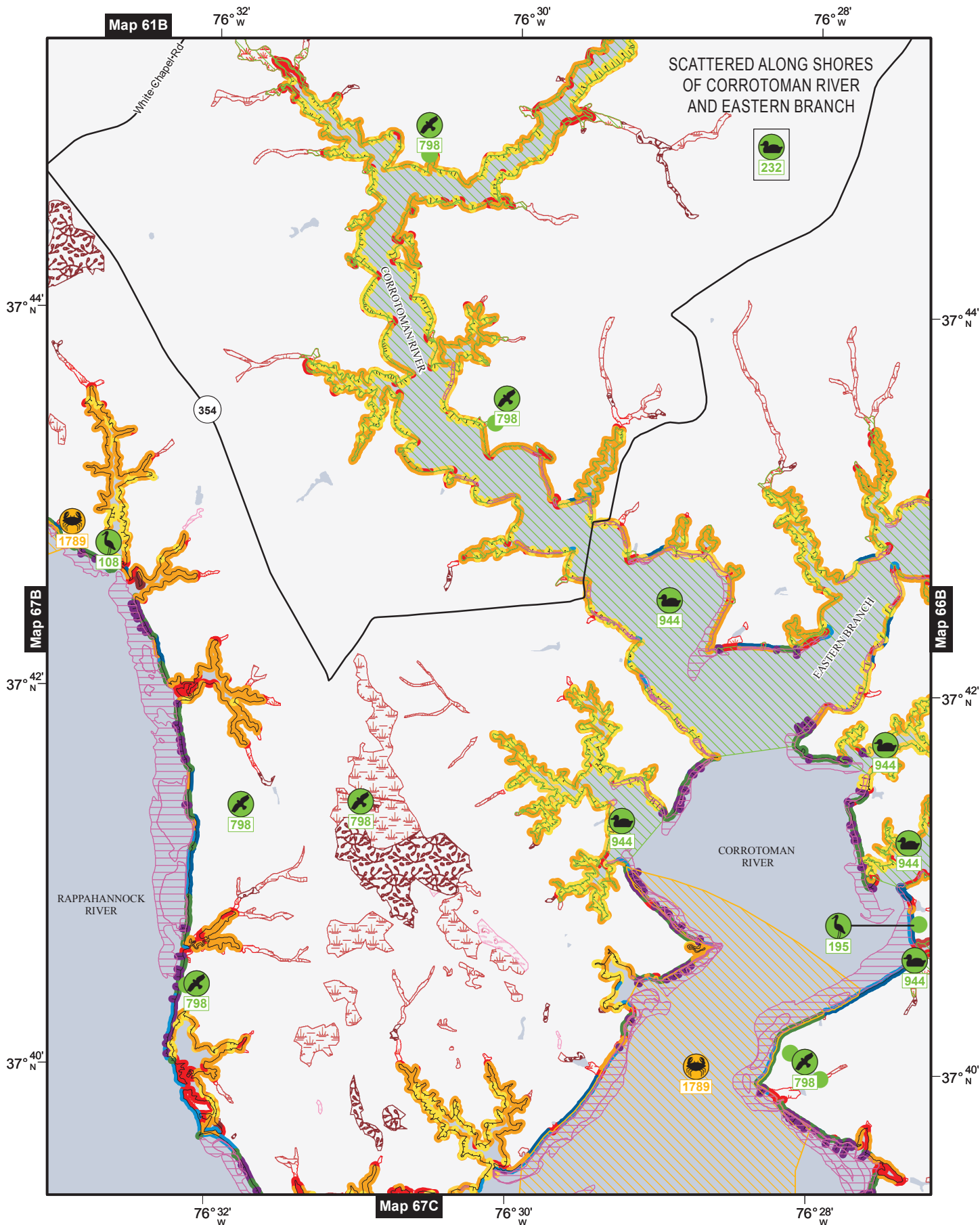
ESI POLYGON HABITAT TYPES			
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
 10A	Salt and Brackish Water Marshes	1,117.64	1.75
 10B	Freshwater Marshes	372.15	0.58
 10C	Swamps	2,542.70	3.97
 10D	Scrub and Shrub Wetlands	666.72	1.04
 9A	Sheltered Tidal Flats	5.81	0.01
 7	Exposed Tidal Flats	12.57	0.02

ESI SHORELINE HABITAT TYPES			
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)
 10A	Salt and Brackish Water Marshes	155,565.83	96.66
 10B	Freshwater Marshes	14,729.51	9.15
 10C	Swamps	16,796.31	10.44
 10D	Scrub and Shrub Wetlands	2,076.76	1.29
 9A	Sheltered Tidal Flats	3,380.97	2.10
 9B	Vegetated Low Banks	177,510.78	110.30
 8B	Sheltered, Solid Man-Made Structures	47,058.68	29.24
 8C	Sheltered Riprap	22,251.64	13.83
 7	Exposed Tidal Flats	3,851.76	2.39
 6B	Riprap	27,264.58	16.94
 5	Mixed Sand and Gravel Beaches	25.60	0.02
 4	Coarse Grained Sand Beaches	27,264.29	16.94
 3B	Scarps and Steep Slopes (Sand)	9,456.83	5.88
 1B	Exposed, Solid Man-Made Structures	13,019.88	8.09
Total ESI Shoreline:		520,253.42	323.27
Total Shoreline:		401,300.35	249.36
			% of ESI Shoreline
			30%
			3%
			3%
			< 1%
			1%
			34%
			9%
			4%
			1%
			5%
			< 1%
			5%
			2%
			3%

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 67A

Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 1 Miles
0 1 Kilometers

1:50,000



Map 67A
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VFA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral													-	-	-
SAV	Submerged aquatic veg	High Ecological Value			High													-	-	-
SAV	Submerged aquatic veg	High Ecological Value			Low													-	-	-

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
108	Wading	Great blue heron	Nesting			6 Nests												Feb-Jun	-	-	-
195	Wading	Great blue heron	Nesting			48 Nests												Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-
944	Waterfowl	Bufflehead	Wintering			100S												-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S												-	-	-	-
	Waterfowl	Gadwall	Wintering			Present												-	-	-	-
	Waterfowl	Mallard	Wintering			10S												-	-	-	-
	Waterfowl	Mergansers	Wintering			100S												-	-	-	-
	Waterfowl	Scaup	Wintering			100S												-	-	-	-
	Waterfowl	Tundra swan	Wintering			10S												-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1789	Crab	Blue crab	Concentration Area			Highly Abundant												-	-	-	Jun-Mar*	Jun-Mar*

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

<div><div></div><div></div></div>	Subelement	Species	Mapping Qualifier	MD/VFA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
<div><div></div><div></div></div>	Diving	Common loon	Wintering			10S												-	-	-		
		D. crested cormorant	Wintering			100S												-	Mar-May	Aug-Nov	-	
		Grebes	Wintering			Present												-	-	-	-	
<div><div></div><div></div></div>	Waterfowl	Red-throated loon	Wintering			10S												-	-	-		
		American black duck	Wintering			10S												-	-	-	-	
		Brant	Wintering			10S												-	-	-	-	
		Bufflehead	Wintering			1,000S												-	-	-	-	

BIRDS (continued)

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
	Canada goose	Wintering			10,000S												-	-	-	-
	Canvasback	Wintering			1,000S												-	-	-	-
	Long-tailed duck	Wintering			10S												-	-	-	-
	Mallard	Wintering			100S												-	-	-	-
	Mergansers	Wintering			1,000S												-	-	-	-
	Ruddy duck	Wintering			1,000S												-	-	-	-
	Scaup	Wintering			1,000S												-	-	-	-
	Scoters	Wintering			10S												-	-	-	-
	Tundra swan	Wintering			100S												-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Atlantic sturgeon	Migration	-/E	E	-													-	-	-	-	Jun-Nov
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Striped bass	Nursery Area			-													-	-	Mar-May	Jan-Dec	-

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle	General Distribution	T/T	T	Rare													-	-	-	May-Dec*	-
	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	Jul-Oct	-

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct






MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Manatee	General Distribution	-/E	E	Rare													-	-	-	-
	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	-





BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-
	Wood duck													Apr-Jul	-	-	Jul-Aug	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Oct	May-Oct
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs		Larvae		Juveniles		Adults
		J	F	M	A	M	J	J	A	S	O	N	D		Jun-Sep	May-Dec*	Jun-Oct	May-Jan*	Jan-Dec	Jan-Dec	
	Eastern oyster																				Jan-Dec
	Softshell clam																				Jan-Dec
	Stout razor clam																				Jan-Dec
	Squid																				Jan-Dec
	Blue crab																				Jan-Dec
	Brown shrimp																				Jan-Dec
	Mantis shrimp																				May-Oct
	White shrimp																				Jan-Dec
																					May-Oct

MARINE MAMMALS

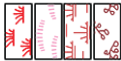
Subelement	Species	Monthly Presence												Mating	Calving		Pupping		Molt	
		J	F	M	A	M	J	J	A	S	O	N	D		-	-	-	-	-	-
	Bottlenose dolphin																			

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	180.55	0.28
10B	Freshwater Marshes	19.91	0.03
10C	Swamps	450.50	0.70
10D	Scrub and Shrub Wetlands	298.27	0.47



ESI SHORELINE HABITAT TYPES

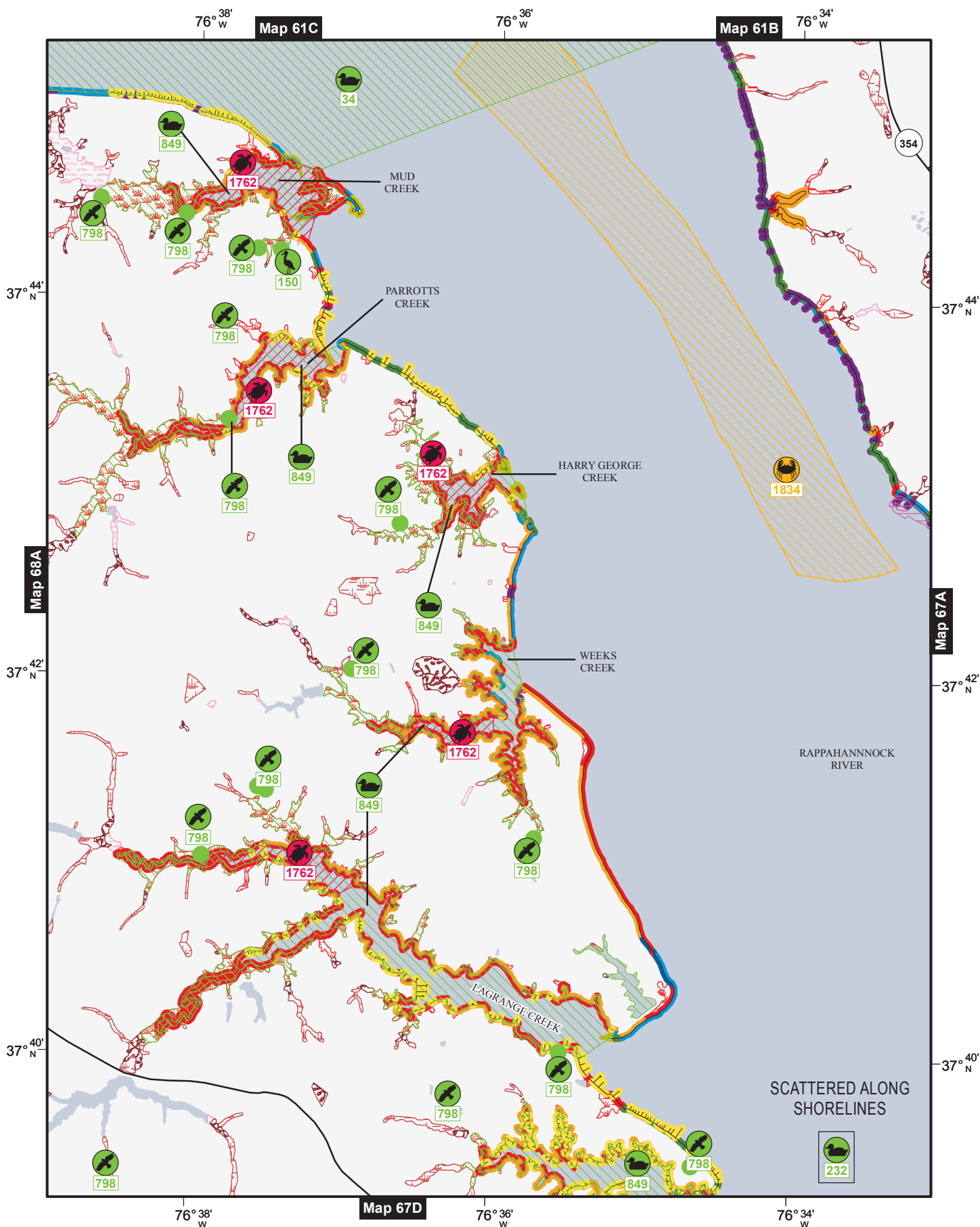
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	27,441.37	17.05	15%
10C	Swamps	226.50	0.14	< 1%
10D	Scrub and Shrub Wetlands	537.56	0.33	< 1%
9B	Vegetated Low Banks	90,991.03	56.54	49%
8B	Sheltered, Solid Man-Made Structures	20,164.02	12.53	11%
8C	Sheltered Riprap	15,998.83	9.94	9%
6B	Riprap	10,763.13	6.69	6%
4	Coarse Grained Sand Beaches	8,669.02	5.39	5%
3B	Scarps and Steep Slopes (Sand)	6,141.24	3.82	3%
1B	Exposed, Solid Man-Made Structures	5,137.87	3.19	3%

Total ESI Shoreline: 186,070.56 Total ESI Shoreline: 115.62
 Total Shoreline: 168,368.15 Total Shoreline: 104.62

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov

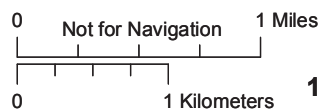




Map 67B
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016



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BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												
			S	F		J	F	M	A	M	J	J	A	S	O	N	D	
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral													
SAV	Submerged aquatic veg	High Ecological Value			Low													

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
34	Waterfowl	Scoters	Wintering			100S												-	-	-	-
150	Wading	Great blue heron	Nesting			10 Nests												Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-
849	Waterfowl	Bufflehead	Wintering			100S												-	-	-	-
	Waterfowl	Canada goose	Wintering			100S												-	-	-	-
	Waterfowl	Canvasback	Wintering			100S												-	-	-	-
	Waterfowl	Mallard	Wintering			10S												-	-	-	-
	Waterfowl	Mergansers	Wintering			100S												-	-	-	-
	Waterfowl	Scaup	Wintering			100S												-	-	-	-



REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1762	Turtle	Diamondback terrapin	Concentration Area			High												May-Aug	-	-	Apr-Oct	Apr-Oct


INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1834	Crab	Blue crab	Concentration Area			Highly Abundant-Wint												-	-	-	Dec-Mar	Dec-Mar


BIRDS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			10S													-	-	-	-
		D. crested cormorant			100S													-	Mar-May	Aug-Nov	-
		Grebes			Present													-	-	-	-
		Red-throated loon			10S													-	-	-	-
		American black duck			10S													-	-	-	-
	Waterfowl	Brant			10S													-	-	-	-
		Winterting			10S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			10,000S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			10S													-	-	-	-
		Winterting			100S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			10S													-	-	-	-
		Winterting			100S													-	-	-	-
FISH		Tundra swan			100S													-	-	-	-


FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Alewife			-													-	-	-	Aug-Nov	Feb-Apr
		American shad			-													-	-	-	Aug-Nov	Feb-Jun
		Atlantic sturgeon	-/E	E	-													-	-	-	-	Jan-Dec
		Atlantic sturgeon	-/E	E	-													-	-	-	-	Jun-Nov
		Blueback herring			-													-	-	-	Aug-Nov	Mar-Jun
		Hickory shad			-													-	-	-	Jun-Sep	Feb-May
		Shortnose sturgeon	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
		Striped bass			-													-	-	Mar-May	Jan-Dec	-

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle	Green sea turtle	T/T	T	Rare													-	-	-	May-Dec*	-
		Green sea turtle	T/T	T	Common													-	-	-	Jul-Oct	-

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Crab	Blue crab			Highly Abundant													-	-	-	Jun-Mar*	Jun-Mar*
		Blue crab			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS

Subelement	Species	Mapping Qualifier General Distribution	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
Manatee	West Indian manatee		-/E	E	Rare												-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)


BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-
Gull/Tern	Gulls													-	-	-	-
	Terns													-	-	-	-

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
Estuarine Nursery	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	Apr-Nov
	Spot													-	-	-	-	May-Nov
	Spotted seatrout													-	-	-	Nov-Apr	Apr-Dec
	Summer flounder													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	-	Apr-Oct	Jan-Dec
	White perch													-	-	May-Aug	Jun-Dec	Apr-Dec
Estuarine Resident	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Blue catfish													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Bullhead catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Spottail shiner													Apr-Jun	-	-	-	Jan-Dec
	Sunfish													May-Aug	-	-	-	Jan-Dec
Marine Benthic	Northern searobin													Mar-Jul	-	-	-	Jan-Dec
														-	-	-	-	Apr-Sep




FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Spotted hake													-	-	-	Dec-Jun	Dec-Jun
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Interstest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diamondback terrapin													May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

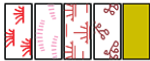
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	581.39	0.91
10B	Freshwater Marshes	56.28	0.09
10C	Swamps	217.48	0.34
10D	Scrub and Shrub Wetlands	138.46	0.22
7	Exposed Tidal Flats	4.12	0.01



ESI SHORELINE HABITAT TYPES

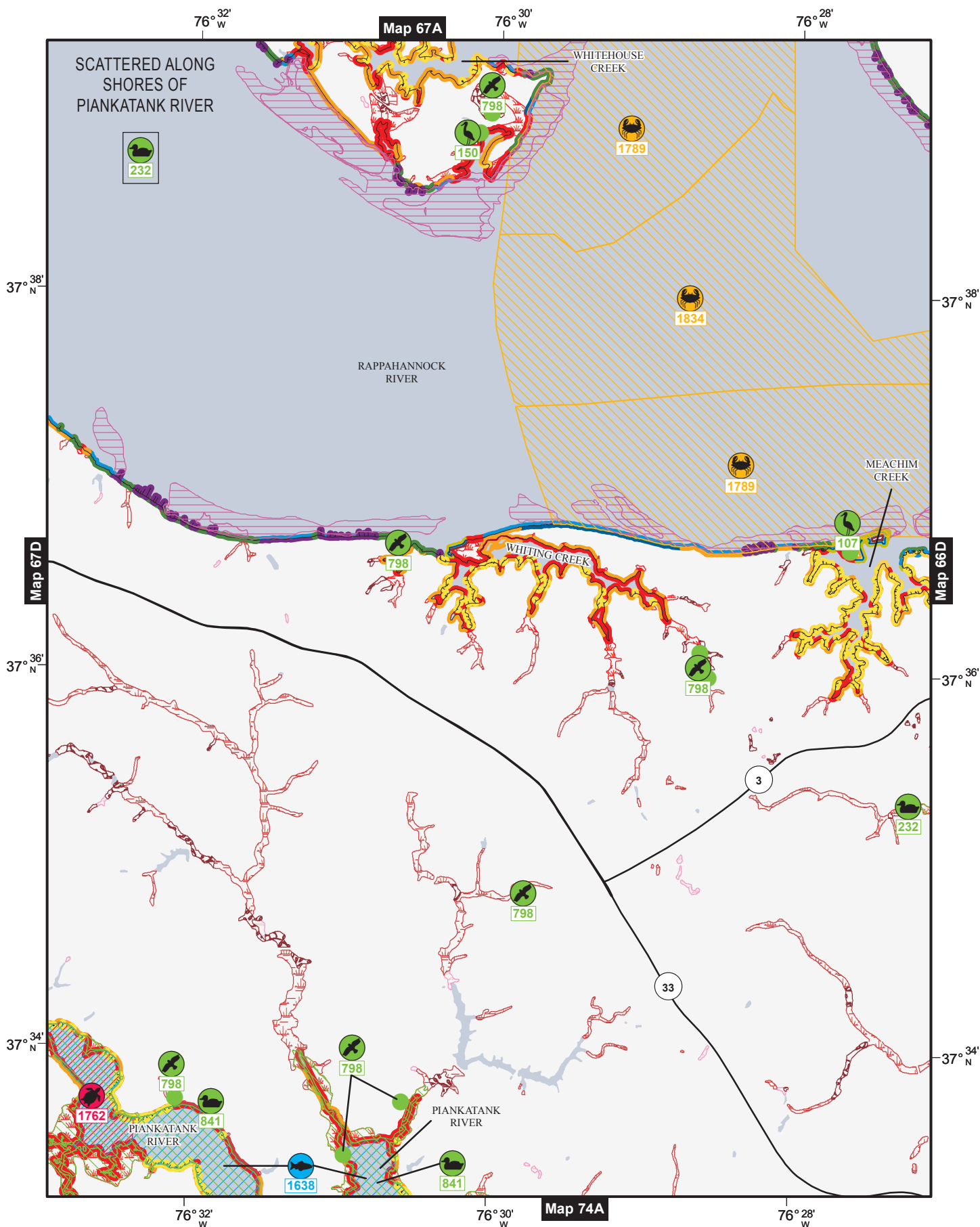
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	66,826.05	41.52	47%
10C	Swamps	341.63	0.21	< 1%
9A	Sheltered Tidal Flats	2,554.59	1.59	2%
9B	Vegetated Low Banks	37,484.22	23.29	26%
8B	Sheltered, Solid Man-Made Structures	10,616.24	6.60	7%
8C	Sheltered Riprap	2,166.71	1.35	2%
7	Exposed Tidal Flats	1,917.64	1.19	1%
6B	Riprap	7,223.00	4.49	5%
4	Coarse Grained Sand Beaches	7,892.59	4.90	6%
3B	Scarps and Steep Slopes (Sand)	756.39	0.47	1%
1B	Exposed, Solid Man-Made Structures	4,284.38	2.66	3%

Total ESI Shoreline: 142,063.44 Total ESI Shoreline: 88.27
Total Shoreline: 97,937.30 Total Shoreline: 60.86

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov





Map 67C
Central Bay



SEE BACK OF MAP
for details about mapped species and
other species that occur in mapped area.
Data Published: September 2016

0 Not for Navigation 1 Miles
0 1 Kilometers

1:50,000



Map 67C
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral													-	-	-
SAV	Submerged aquatic veg	High Ecological Value			High													-	-	-
SAV	Submerged aquatic veg	High Ecological Value			Low													-	-	-

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
107	Wading	Great blue heron	Nesting			22 Nests												Feb-Jun	-	-	-
150	Wading	Great blue heron	Nesting			10 Nests												Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-
841	Waterfowl	American black duck	Wintering			Present												-	-	-	-
	Waterfowl	Bufflehead	Wintering			100S												-	-	-	-
	Waterfowl	Canada goose	Wintering			100S												-	-	-	-
	Waterfowl	Canvasback	Wintering			10S												-	-	-	-
	Waterfowl	Mallard	Wintering			10S												-	-	-	-
	Waterfowl	Mergansers	Wintering			100S												-	-	-	-
	Waterfowl	Tundra swan	Wintering			10S												-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1638	Diadromous	Striped bass	Migration			-												-	-	-	-	Feb-Jun



REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1762	Turtle	Diamondback terrapin	Concentration Area			High												May-Aug	-	-	Apr-Oct	Apr-Oct


INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1789	Crab	Blue crab	Concentration Area			Highly Abundant												-	-	-	Jun-Mar*	Jun-Mar*
1834	Crab	Blue crab	Concentration Area			Highly Abundant-Wint												-	-	-	Dec-Mar	Dec-Mar

BIRDS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon			10S													-	-	-	-
		D. crested cormorant			100S													-	Mar-May	Aug-Nov	-
		Grebes			Present													-	-	-	-
		Red-throated loon			10S													-	-	-	-
		American black duck			10S													-	-	-	-
	Waterfowl	Brant			10S													-	-	-	-
		Winterting			10S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			10,000S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			10S													-	-	-	-
		Winterting			100S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			1,000S													-	-	-	-
		Winterting			10S													-	-	-	-
		Winterting			100S													-	-	-	-
FISH		Tundra swan			100S													-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Alewife			-													-	-	-	Aug-Nov	Feb-Apr
		American shad			-													-	-	-	Aug-Nov	Feb-Jun
		Atlantic sturgeon			-E E													-	-	-	-	Jan-Dec
		Atlantic sturgeon			-E E													-	-	-	-	Jun-Nov
		Blueback herring			-													-	-	-	Aug-Nov	Mar-Jun
		Hickory shad			-													-	-	-	Jun-Sep	Feb-May
		Shortnose sturgeon			E/E E													-	-	-	Jan-Dec	Jan-Dec
		Striped bass			-													-	-	Mar-May	Jan-Dec	-

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle	Green sea turtle			Rare													-	-	-	May-Dec*	-
		Green sea turtle			Common													-	-	-	Jul-Oct	-

INVERTEBRATES

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Crab	Blue crab			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct

MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
			S	F	J	F	M	A	M	J	J	A	S	O	N	D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Manatee	West Indian manatee	General Distribution	-/E	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)



BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Diving	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
Gull/Tern	Gulls													-	-	-	-
	Terns													-	-	-	-
Waterfowl	Wood duck													Apr-Jul	-	-	Jul-Aug

FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Jan-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
Estuarine Resident	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Freshwater																	
	Marine Benthic																	
	Striped burrfish																	
	Blue catfish																	
	Atlantic spadefish																	
	Cleannose skate																	
	Cownose ray																	
	Northern searobin																	
	Northern searobin																	
	Red hake																	
	Silver hake																	
	Spotted hake																	
	Butterfish																	
	Cobia																	
	Harvestfish																	
	Lined seahorse																	
	Spanish mackerel																	

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Interest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle													May-Aug	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
														May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Cephalopod													Jun-Nov	-	-	Jan-Dec	Jan-Dec
														-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Crab													-	-	-	Jan-Dec	Jan-Dec
														-	-	-	May-Oct	May-Oct
	Shrimp													-	-	-	Jan-Dec	Jan-Dec
														-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
														-	-	-	May-Oct	May-Oct
	White shrimp													-	-	-	May-Oct	May-Oct
														-	-	-	May-Oct	May-Oct

MARINE MAMMALS

Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin													-	-	-	-
	Bottlenose dolphin													-	-	-	-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	266.40	0.42
10B	Freshwater Marshes	16.80	0.03
10C	Swamps	333.65	0.52
10D	Scrub and Shrub Wetlands	94.93	0.15
9A	Sheltered Tidal Flats	5.81	0.01
7	Exposed Tidal Flats	8.45	0.01



ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	41,710.92	25.92	39%
10C	Swamps	2,802.68	1.74	3%
10D	Scrub and Shrub Wetlands	1,161.89	0.72	1%
9A	Sheltered Tidal Flats	826.37	0.51	1%
9B	Vegetated Low Banks	29,221.80	18.16	28%
8B	Sheltered, Solid Man-Made Structures	6,778.82	4.21	6%
8C	Sheltered Riprap	2,383.30	1.48	2%
7	Exposed Tidal Flats	1,646.02	1.02	2%
6B	Riprap	5,687.32	3.53	5%
4	Coarse Grained Sand Beaches	8,186.40	5.09	8%
3B	Scarps and Steep Slopes (Sand)	1,810.89	1.13	2%
1B	Exposed, Solid Man-Made Structures	3,522.55	2.19	3%



Total ESI Shoreline: 105,738.97 Total ESI Shoreline: 65.70
 Total Shoreline: 71,754.39 Total Shoreline: 44.59

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 67D
Central Bay

BIOLOGICAL RESOURCES

Note: An asterisk (*) indicates that life stage occurs in this range but not in all months included

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence											
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N
SAV	Submerged aquatic veg	High Ecological Value			Ephemeral											

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N					
143	Wading	Great blue heron	Nesting			7 Nests												Feb-Jun	-	-		
148	Wading	Great blue heron	Nesting			32 Nests												Feb-Jun	-	-		
149	Wading	Great blue heron	Nesting			18 Nests												Feb-Jun	-	-		
166	Wading	Great blue heron	Nesting			11 Nests												Feb-Jun	-	-		
232	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	Jun-Jul		
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	Jul-Aug		
679	Waterfowl	Brant	Wintering			10S												-	-	-		
	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-		
	Waterfowl	Canada goose	Wintering			10,000S												-	-	-		
	Waterfowl	Canvasback	Wintering			1,000S												-	-	-		
	Waterfowl	Mallard	Wintering			100S												-	-	-		
	Waterfowl	Mergansers	Wintering			1,000S												-	-	-		
	Waterfowl	Scaup	Wintering			1,000S												-	-	-		
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-		
848	Waterfowl	American black duck	Wintering			10S												-	-	-		
	Waterfowl	Bufflehead	Wintering			100S												-	-	-		
	Waterfowl	Canada goose	Wintering			100S												-	-	-		
	Waterfowl	Canvasback	Wintering			100S												-	-	-		
	Waterfowl	Mallard	Wintering			10S												-	-	-		
	Waterfowl	Mergansers	Wintering			100S												-	-	-		
	Waterfowl	Ruddy duck	Wintering			1,000S												-	-	-		
	Waterfowl	Scaup	Wintering			100S												-	-	-		
	Waterfowl	Tundra swan	Wintering			100S												-	-	-		
849	Waterfowl	Bufflehead	Wintering			100S												-	-	-		
	Waterfowl	Canada goose	Wintering			100S												-	-	-		
	Waterfowl	Canvasback	Wintering			100S												-	-	-		
	Waterfowl	Mallard	Wintering			10S												-	-	-		
	Waterfowl	Mergansers	Wintering			100S												-	-	-		
	Waterfowl	Scaup	Wintering			100S												-	-	-		
1023	Diving	Common loon	Wintering			10S												-	-	-		
	Diving	D. crested cormorant	Wintering			100S												Mar-May	Aug-Nov	-		
	Diving	Grebes	Wintering			Present												-	-	-		

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
	Diving	Red-throated loon	Wintering			10S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Scoters	Wintering			10S													-	-	-
1059	Waterfowl	American black duck	Wintering			10S													-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-
	Diving	Grebes	Wintering			Present													-	-	-
	Waterfowl	American black duck	Wintering			Present													-	-	-
	Waterfowl	Bufflehead	Wintering			100S													-	-	-
	Waterfowl	Canada goose	Wintering			100S													-	-	-
	Waterfowl	Canvasback	Wintering			10S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Mallard	Wintering			10S													-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-
	Waterfowl	Tundra swan	Wintering			10S													-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1556	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												-	-	-	Jan-Dec		
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-												-	-	-	Jan-Dec		
	Diadromous	Striped bass	Nursery Area			-												-	-	-	Jan-Dec		
1575	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												-	-	-	Jan-Dec		
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-												-	-	-	Jan-Dec		
1601	Diadromous	Atlantic sturgeon	Migration	-/E	E	-												-	-	-	Jun-Nov		
	Diadromous	Hickory shad	Migration			-												-	-	-	Feb-May		
1621	Diadromous	Alewife	Migration			-												-	-	-	Aug-Nov		
	Diadromous	American shad	Migration			-												-	-	-	Aug-Nov		
	Diadromous	Blueback herring	Migration			-												-	-	-	Aug-Nov		
1638	Diadromous	Striped bass	Migration			-												-	-	-	Feb-Jun		

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
1762	Turtle	Diamondback terrapin	Concentration Area			High													May-Aug	-	-	Apr-Oct	Apr-Oct
1767	Turtle	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	Jul-Oct	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	May-Dec*	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct
1814	Bivalve	Eastern elliptio	Vulnerable Occurrence			-													-	-	-	Jan-Dec	Jan-Dec

Central Bay: Map 67D

MD/VA Monthly Presence





ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

Monthly Presence

FISH

422

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Fish													Apr-Sep	-	-	-	Jan-Dec
	Anchovies																	
	Striped burrfish																May-Oct	May-Oct
	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Atlantic spadefish																-	Jun-Sep
	Cleannose skate																	Jan-Dec
	Cownose ray													Jun-Jul			May-Oct	May-Oct
	Northern searobin																-	Apr-Sep
	Northern searobin													May-Jul			-	Apr-Dec
	Red hake																-	Sep-May*
	Silver hake																-	Oct-May
	Spotted hake																-	Jan-Dec
	Butterfish																Jan-Dec	Mar-Nov
	Cobia																-	Jun-Sep
	Harvestfish																-	May-Nov
	Lined seahorse													May-Oct			-	Jan-Dec
	Spanish mackerel																-	May-Sep
																	-	

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle													May-Aug	-	-	Apr-Oct	Apr-Oct
	Diamondback terrapin																	

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Eastern oyster													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Softshell clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Stout razor clam																-	Jan-Dec
	Cephalopod																Apr-Dec	Apr-Dec
	Crab																Jan-Dec	Jan-Dec
	Blue crab																-	Jan-Dec
	Shrimp																May-Oct	May-Oct
	Brown shrimp																-	Jan-Dec
	Mantis shrimp																-	Jan-Dec
	White shrimp																-	May-Oct

MARINE MAMMALS

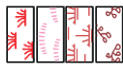
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin																
	Bottlenose dolphin																-

For additional information about species locations and extent, reference the underlying GIS data available from response.restoration.noaa.gov

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	89.29	0.14
10B	Freshwater Marshes	279.16	0.44
10C	Swamps	1,541.07	2.41
10D	Scrub and Shrub Wetlands	135.06	0.21



ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	19,587.49	12.17	23%
10B	Freshwater Marshes	14,729.51	9.15	17%
10C	Swamps	13,425.51	8.34	16%
10D	Scrub and Shrub Wetlands	377.31	0.23	< 1%
9B	Vegetated Low Banks	19,813.72	12.31	23%
8B	Sheltered, Solid Man-Made Structures	9,499.60	5.90	11%
8C	Sheltered Riprap	1,702.80	1.06	2%
7	Exposed Tidal Flats	288.10	0.18	< 1%
6B	Riprap	3,591.13	2.23	4%
5	Mixed Sand and Gravel Beaches	25.60	0.02	< 1%
4	Coarse Grained Sand Beaches	2,516.28	1.56	3%
3B	Scarps and Steep Slopes (Sand)	748.31	0.46	1%
1B	Exposed, Solid Man-Made Structures	75.08	0.05	< 1%
































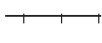



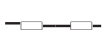




Total ESI Shoreline: 86,380.44 Total ESI Shoreline: 53.67
 Total Shoreline: 63,240.50 Total Shoreline: 39.30

Note: A shoreline segment may include multiple shoreline habitats. If any segments include multiple habitats, the combined length of all habitats may exceed the length of the mapped shoreline, and the percent of ESI shoreline values will sum to greater than 100%

































All underlying GIS data can be obtained from response.restoration.noaa.gov



Human-Use Features

	Aquaculture		Park
	Airport		Port
	Anchorage		Recreational Fishing
	Artificial Reef		Repeated Measurement Site
	Abandoned Vessel		State Protected
	Beach		Tribal Land
	Boat Ramp		Water Intake
	Commercial Fishing		Wildlife Refuge
	Critical Habitat		US Highway
	EPA Facility		State Highway or Route
	Ferry		Interstate
	Heliport		Road
	Historical Site		Shipping Lane
	Lock and Dam		Rail Route
	Marina		Pipeline
	Military		Ferry Route
	Mooring Site		Management Area
	Management Area		Management Area
	National Estuarine Research Reserve		Map ID
	National Park		
	Nature Conservancy		

ESI Shoreline and Habitat Ranking

		1A) Exposed, Rocky Shores 1B) Exposed, Solid Man-Made Structures
		2B) Exposed Scarps and Steep Slopes (Clay)
		3A) Fine to Medium Grained Sand Beaches 3B) Scarps and Steep Slopes (Sand)
		4) Coarse-Grained Sand Beaches
		5) Mixed Sand and Gravel Beaches
		6A) Gravel Beaches
		6B) Riprap 6D) Boulder Rubble
		7) Exposed Tidal Flats
		8A) Sheltered Scarps (Bedrock/Mud/Clay)
		8B) Sheltered, Solid Man-Made Structures
		8C) Sheltered Riprap 8D) Sheltered, Rocky, Rubble Shores
		9A) Sheltered Tidal Flats 9B) Vegetated Low Banks
		10A) Salt and Brackish Water Marshes
		10B) Freshwater Marshes
		10C) Swamps
		10D) Scrub and Shrub Wetlands








































Examples of Double and Triple Shoreline Rankings:

 10D & 2A

 10C & 10A & 4

Shorelines often contain varied geomorphology, and therefore may require two or three ESI types to describe. These symbols will look similar to the examples above. The first shoreline type listed is the most landward shore type.

Sensitive Biological Resources

	Birds		Invertebrates		Terrestrial Mammals
	Birds		Invertebrates		Small Mammal
	Alcid/Pelagic		Crab/Invertebrate/Shellfish		Ungulate
	Diving		Bivalve/Barnacle/Chordate		Bat
	Gull/Tern/Bird		Cephalopod		Habitats
	Passerine		Insect		Upland/Wetland/Plant
	Raptor		Gastropod		Reptiles &
	Shorebird		Lobster		Amphibian
	Wading		Shrimp		Turtle
	Waterfowl		Marine Mammals		Threatened or Endangered Species
	Fish		Dolphin	 Map ID	
	Fish		Pinniped		
	Nursery		Whale		
	Fish		Manatee		

Guidelines for Interpreting Environmental Sensitivity Index (ESI) Maps

The following guidelines may help map users interpret the ESI maps. Additional information about resources mapped for this atlas can be found in the ESI Intro pages and associated metadata.

Sensitive Biological Resources (1:50,000 scale maps): Species are arranged into eight major categories or "elements" and further subdivided into "subelement" groupings representing species that share similar lifestyle characteristics and risks to oiling.

Biological resources may be mapped as points, lines, and/or polygons. Each element is represented by a unique color and/or hatch pattern, and icons illustrate the subelement(s) found within each feature. If a species is state or federally listed as threatened or endangered, a solid red square is placed behind the icon. When multiple elements occur in the same location, overlapping hatch patterns will be shown.

The associated Map ID "links" to the map report where the species and attributes are listed. To maximize readability, biological polygons covering more than 10 square km are not displayed on the map. Instead, these species are listed in the "Widespread in Mapped Area" section of the report. Occurrences of non-listed species assigned a "General Distribution" mapping qualifier are listed under "Also Present in Mapped Area" regardless of polygon size.

Shoreline Habitat Resources (all maps): The shoreline was mapped at mean-high water, then classified based on vulnerability to spilled oil and ease of clean-up. Shorelines are ranked on a scale from 1 (least vulnerable) to 10 (most vulnerable). Cooler colors represent less vulnerable shoreline types; warm and hot colors indicate increased vulnerability. A shoreline may have more than one habitat type present. When this happens, the most landward shoreline type is mapped on the shoreline, and the more seaward type(s) are mapped adjacent to the water. The areal extent of intertidal and marsh habitats may also be mapped as polygons. Most often these polygons represent tidal flats and marshes, though in particularly rocky shored areas, these may include exposed, wave-cut platforms and sand and gravel beaches.

Human-Use Features (1:100,000 scale maps): Locations of human-use features and jurisdictional boundaries are mapped as points, lines, or polygons. As with biological features, the human-use features appearing on the map include Map ID which "links" to a description of the feature in the map report. Additional features, particularly jurisdictional and management boundaries that cover the majority or entirety of the mapped area, are listed in the report, but not shown on the map.

