

Environmental Sensitivity Index Maps

A Guide to Coastal Resources at Risk to Spilled Oil

Chesapeake Bay: Volume 9 Lower James River



Office of Response and Restoration

September 2016

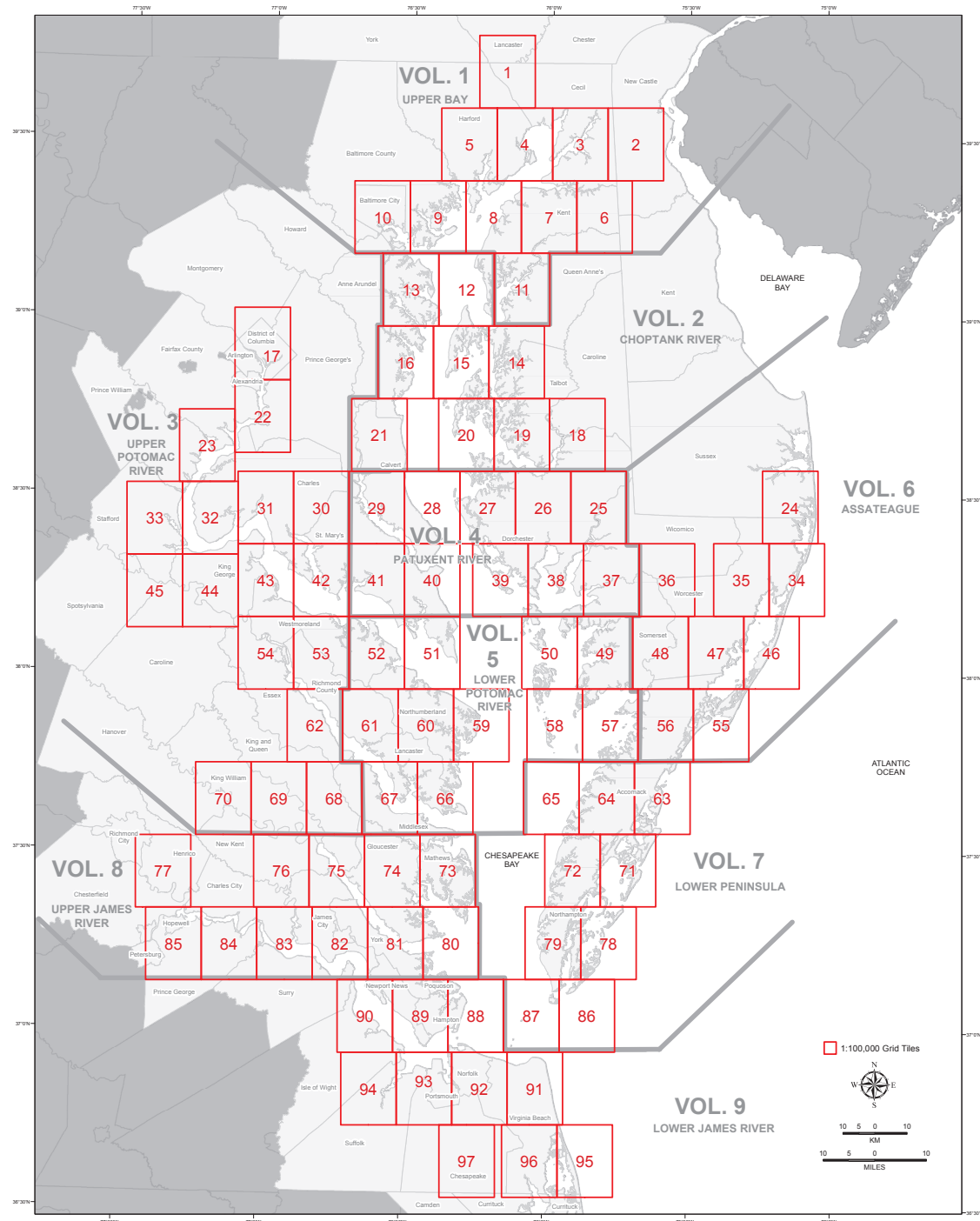
NOAA

Environmental Sensitivity

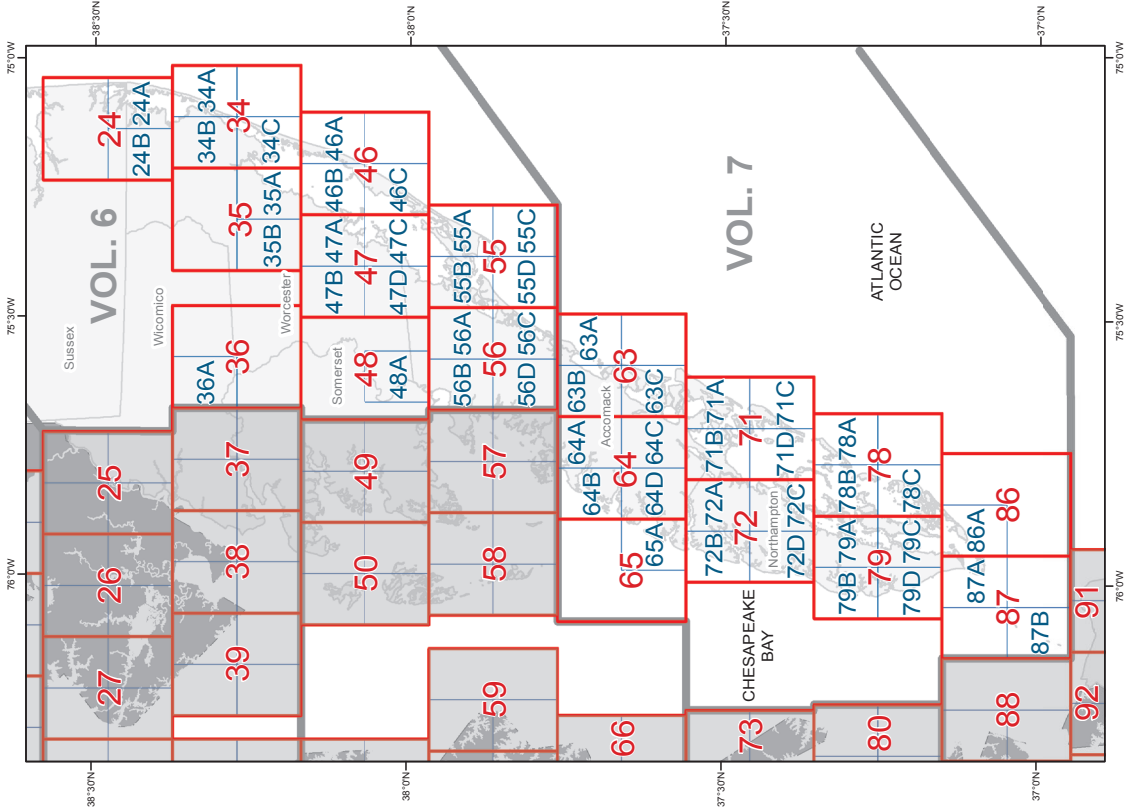
Index Maps

A Guide to Coastal Resources at Risk to Spilled Oil

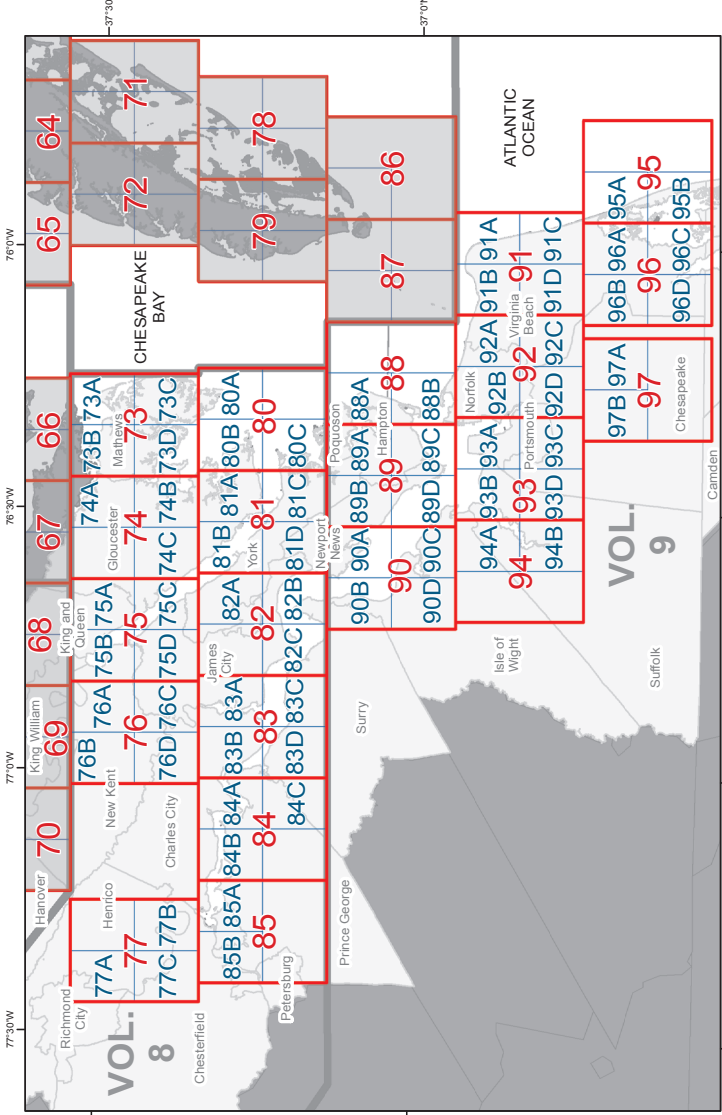
Chesapeake Bay and the Outer Coasts of Maryland and Virginia



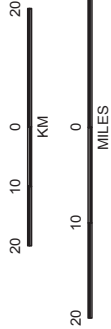
Chesapeake Bay: Volumes 6 and 7
(Delmarva Peninsula: Assateague and Lower Peninsula)



Chesapeake Bay: Volumes 8 and 9
(Chesapeake South: Upper James River and Lower James River)



1:100,000 Grid Tiles
1:50,000 Grid Tiles



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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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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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- USFWS. 2014. Back Bay NWR peak bird numbers, 2013 and 2014, spreadsheets.
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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

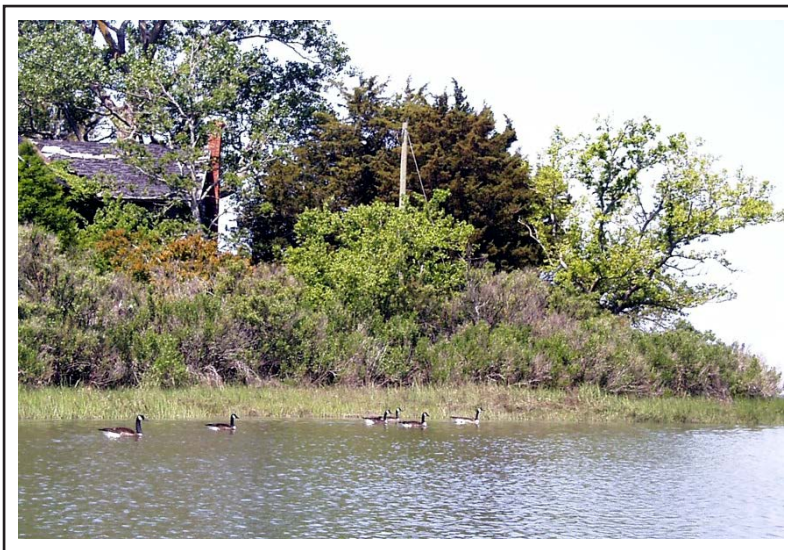
SHORELINE DESCRIPTIONS

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

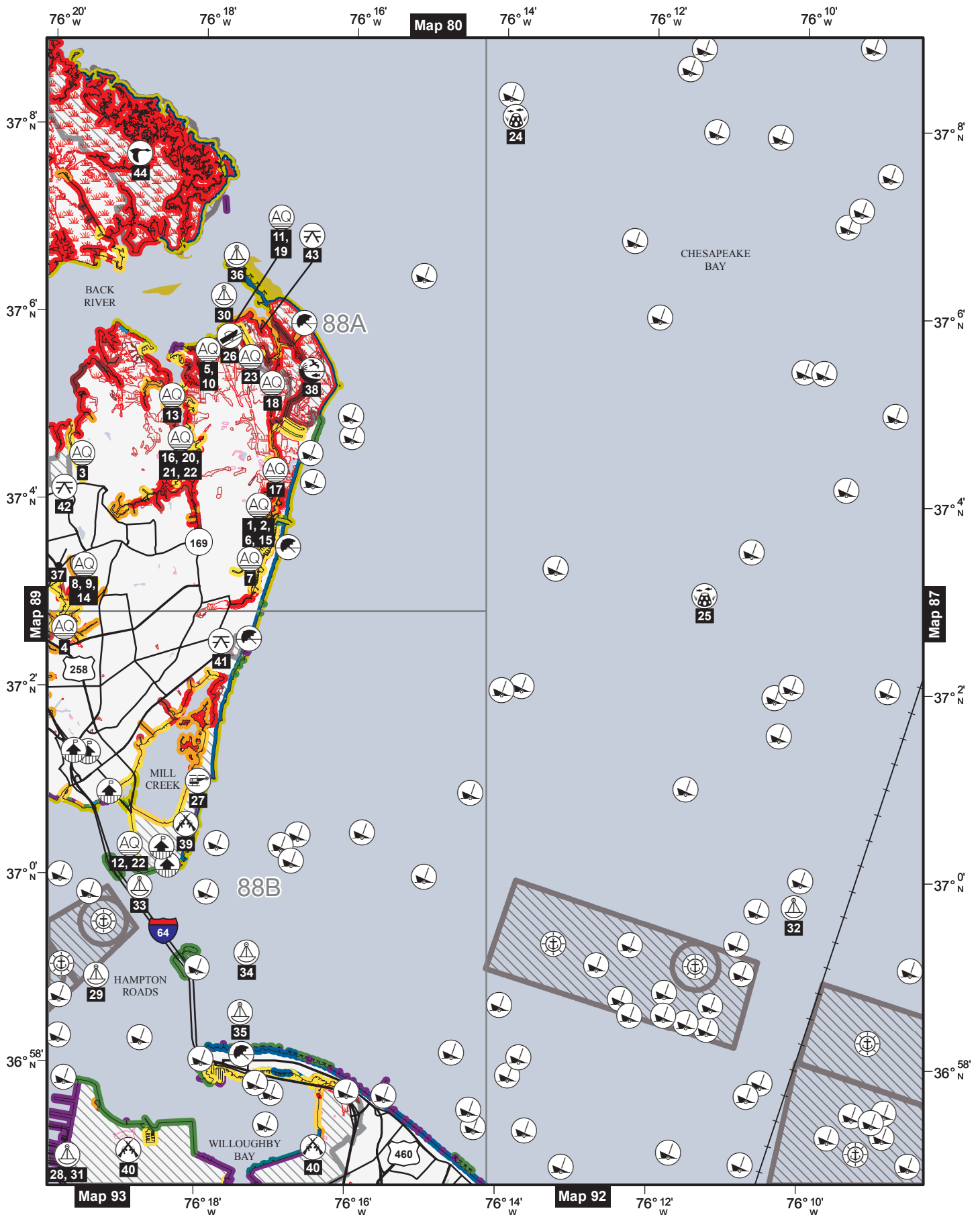
- Oil behavior depends on water level
- During high water, most of the oil passes through the forest, coating the vegetation above the waterline
- Woody vegetation is less sensitive than grasses to oil
- Some oil can be trapped and pooled on the floodplain as water levels drop
- Penetration into the 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 88
Chesapeake South



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 88
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)					
Map ID	Type	Name	Contact	Phone	
1	AQUACULTURE	OYSTER NON-COMM ADAMS RF#00-0958	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
2	AQUACULTURE	OYSTER NON-COMM ADAMS RF#99-1027	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
3	AQUACULTURE	OYSTER NON-COMM BUCCARELLI RF#99-0937	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
4	AQUACULTURE	OYSTER NON-COMM CRIST, BOB RF#00-0960	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
5	AQUACULTURE	OYSTER NON-COMM DANDY HAVEN MARINA RF#00-0957	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
6	AQUACULTURE	OYSTER NON-COMM DENZLER, ET AL RF#99-1002	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
7	AQUACULTURE	OYSTER NON-COMM DENZLER, ETAL RF#00-0966	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
8	AQUACULTURE	OYSTER NON-COMM DRIFTMEYER, JEFF RF#00-0484	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
9	AQUACULTURE	OYSTER NON-COMM ESPICH, HILLARY RF#99-1821	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
10	AQUACULTURE	OYSTER NON-COMM HAMPTON DEPT OF PUB RF#98-2272	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
11	AQUACULTURE	OYSTER NON-COMM HAMPTON DEPT OF PUB RF#98-2274	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
12	AQUACULTURE	OYSTER NON-COMM KIRBY, WILLIAM H. RF#98-2273	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
13	AQUACULTURE	OYSTER NON-COMM MILLER, JESS P. RF#98-2154	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
14	AQUACULTURE	OYSTER NON-COMM MOBERG RF#00-2294	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
15	AQUACULTURE	OYSTER NON-COMM PICKLER RF#99-1754	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
16	AQUACULTURE	OYSTER NON-COMM ROUTTEN, OLLIE S. RF#00-1266	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
17	AQUACULTURE	OYSTER NON-COMM SECK RF#980997	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
18	AQUACULTURE	OYSTER NON-COMM TIGNOR, RHETT RF#00-0969	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
19	AQUACULTURE	OYSTER NON-COMM WALLACE'S BAIT & TACKLE RF#00-0968	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
20	AQUACULTURE	OYSTER NON-COMM WINGFIELD, B. F. RF#99-0776	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
21	AQUACULTURE	OYSTER NON-COMM WINGFIELD, BEN RF#00-0967	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
22	AQUACULTURE	OYSTER NON-COMM WOODALL RF#00-1850	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
23	AQUACULTURE	OYSTER NON-COMM ZIEGENBEIN, WILSON RF#2000-2290	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
24	ARTIFICIAL REEF	BACK RIVER			
25	ARTIFICIAL REEF	BLUEFISH ROCK			
26	BOAT RAMP	FOX HILL	LENE PENNINGTON, VDGIF	804-367-0058	
27	HELIPORT	WALKER ARMY			
28	REPEATED MEASUREMENT SITE	DB - NOS, 8638610 - SEWELLS POINT, VA	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382	
29	REPEATED MEASUREMENT SITE	DB - NOS, 8638614 - WILLOUGHBY DEGUASSING STATION	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382	
30	REPEATED MEASUREMENT SITE	MWS - SITE CBDP	GREG PINIAK, PROJECT MANAGER	301-713-3028	
31	REPEATED MEASUREMENT SITE	NWOLON - SEWELLS POINT, HAMPTON ROADS	NATIONAL WATER LEVEL PROGRAM	301-713-2815	
32	REPEATED MEASUREMENT SITE	WQ - STATION CB8.1	CHESAPEAKE BAY PROGRAM	800-968-7229	
33	REPEATED MEASUREMENT SITE	WQ - STATION LE5.5	CHESAPEAKE BAY PROGRAM	800-968-7229	
34	REPEATED MEASUREMENT SITE	WQ - STATION LE5.5A	CHESAPEAKE BAY PROGRAM	800-968-7229	
35	REPEATED MEASUREMENT SITE	WQ - STATION LE5.5B	CHESAPEAKE BAY PROGRAM	800-968-7229	
36	REPEATED MEASUREMENT SITE	WQ - STATION WE4.4	CHESAPEAKE BAY PROGRAM	800-968-7229	

DISPLAYED ON MAP (LINES)			
Map ID	Type	Name	Phone
37	PIPELINE	PIPELINE	Contact
DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Phone
38	MANAGEMENT AREA	GRANDVIEW NATURE PRESERVE	CITY OF HAMPTON
39	MILITARY	FT MONROE	
40	MILITARY	NAVAL STATION NORFOLK	
41	PARK	BUCKROE PARK	CITY OF HAMPTON
42	PARK	GOSNOLDS HOPE PARK	CITY OF HAMPTON
43	PARK	GRUNLAND CREEK PARK	CITY OF HAMPTON
44	WILDLIFE REFUGE	PLUM TREE ISLAND NWR	UNITED STATES FISH AND WILDLIFE SERVICE
ALSO PRESENT IN MAPPED AREA (POINTS)			
Type	Name	Contact	Phone
COAST GUARD	HDCU NORFOLK		757-887-4836
ALSO PRESENT IN MAPPED AREA (POLYGONS)			
Type	Name	Contact	Phone
STATE PROTECTED AREA	BLUE CRAB SANCTUARY	VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200

JURISDICTIONS

COUNTY: HAMPTON CITY, NORFOLK CITY, POQUOSON CITY, VIRGINIA BEACH CITY
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	3,111.21	4.86
10B	Freshwater Marshes	54.46	0.09
10C	Swamps	547.87	0.86
10D	Scrub and Shrub Wetlands	115.96	0.18
9A	Sheltered Tidal Flats	8.89	0.01
7	Exposed Tidal Flats	132.96	0.21



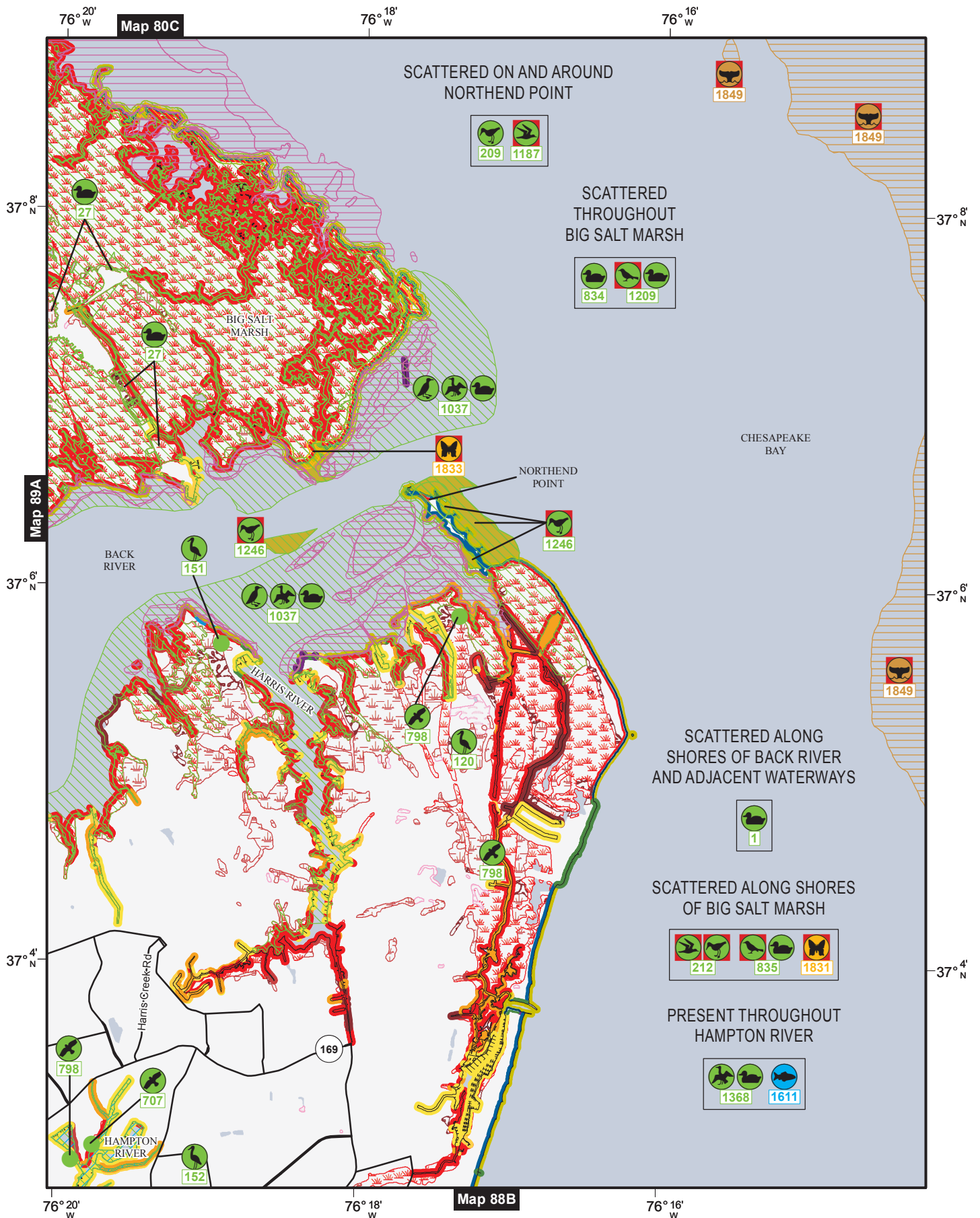
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	196,371.39	122.02	49%
10C	Swamps	5,796.32	3.60	1%
10D	Scrub and Shrub Wetlands	7,913.33	4.92	2%
9A	Sheltered Tidal Flats	23,297.38	14.48	6%
9B	Vegetated Low Banks	12,860.42	7.99	3%
8B	Sheltered, Solid Man-Made Structures	34,173.92	21.23	8%
8C	Sheltered Riprap	12,998.94	8.08	3%
7	Exposed Tidal Flats	37,704.10	23.43	9%
6B	Riprap	22,571.23	14.03	6%
4	Coarse Grained Sand Beaches	589.82	0.37	< 1%
3A	Fine to Medium Grained Sand Beaches	34,005.79	21.13	8%
1B	Exposed, Solid Man-Made Structures	16,236.31	10.09	4%
Total ESI Shoreline:		404,518.96	251.36	
Total Shoreline:		316,954.83	196.95	

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 88A
Chesapeake South

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												
27	Waterfowl	American black duck	Nesting		Present												
	Waterfowl	American black duck	Wintering		10S												
	Waterfowl	Bufflehead	Wintering		10S												
	Waterfowl	Canada goose	Nesting		Present												
	Waterfowl	Canada goose	Wintering		10S												
	Waterfowl	Mallard	Nesting		Present												
	Waterfowl	Mallard	Wintering		10S												
120	Wading	Great blue heron	Nesting		5 Nests												
151	Wading	Great blue heron	Nesting		28 Nests												
152	Wading	Great egret	Nesting		202 Nests												
209	Shorebird	American oystercatcher	Nesting		-												
212	Gull/Tern	Black skimmer	Nesting	E/-	-												
	Gull/Tern	Least tern	Nesting	T/-	-												
	Shorebird	American oystercatcher	Nesting		-												
	Shorebird	Black-bellied plover	Migration		-												
	Shorebird	Piping plover	Migration		-												
	Shorebird	Red knot	Migration		-												
	Shorebird	Shorebirds	Concentration Area		High Diversity												
707	Raptor	Bald eagle	Roosting		-												
798	Raptor	Bald eagle	Nesting		1 Nest												
834	Waterfowl	American black duck	Wintering		10S												
	Waterfowl	Bufflehead	Wintering		10S												
	Waterfowl	Canada goose	Wintering		10S												
	Waterfowl	Mallard	Wintering		10S												
	Passerine	Sedge wren	General Distribution		-												
835	Waterfowl	American black duck	Nesting	E/-	-												
	Waterfowl	American black duck	Wintering		10S												

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			
	Waterfowl	Bufflehead	Wintering			10S												-	-	-	-
	Waterfowl	Canada goose	Wintering			10S												-	-	-	-
	Waterfowl	Mallard	Wintering			10S												-	-	-	-
1037	Diving	Common loon	Wintering			10S												-	-	-	-
	Diving	Grebes	Wintering			10S												-	-	-	-
	Pelagic	Northern gannet	Wintering			Present												-	-	-	-
	Waterfowl	American black duck	Wintering			100S												-	-	-	-
	Waterfowl	American wigeon	Wintering			10S												-	-	-	-
	Waterfowl	Blue-winged teal	Migration			10S												-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering			100S												-	-	-	-
	Waterfowl	Canada goose	Wintering			100S												-	-	-	-
	Waterfowl	Canvasback	Wintering			100S												-	-	-	-
	Waterfowl	Common goldeneye	Wintering			Present												-	-	-	-
	Waterfowl	Green-winged teal	Wintering			10S												-	-	-	-
	Waterfowl	Mallard	Wintering			100S												-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S												-	-	-	-
	Waterfowl	Scaup	Wintering			10S												-	-	-	-
1187	Gull/Tern	Least tern	Nesting	TI/-		42 Pairs												May-Jul	-	-	-
1209	Passerine	Sedge wren	General Distribution	E/-		-												-	-	-	-
	Waterfowl	American black duck	Nesting			-												Apr-Jul	-	-	-
1246	Shorebird	Red knot	Migration	T/T	T	-												-	Apr-Jun	Jul-Oct	-
1368	Diving	D. crested cormorant	Wintering			1,000S												-	Mar-May	Aug-Nov	-
	Waterfowl	Long-tailed duck	Wintering			Present												-	-	-	-

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				
1611	Diadromous	Striped bass	Nursery Area			-												-	-	Mar-May	Jan-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				
1831	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	High, Distinct Pop												Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-												Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug



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													-	-	-	-




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	Wintering			Present													-	-	-	-
	Common loon	Wintering			100S													-	-	-	-
	D. crested cormorant	Wintering			100S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			100S													-	-	-	-
	Red-throated loon	Wintering			Present													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Northern gannet	Wintering			100S													-	-	-	-
	Northern harrier	Nesting			-													Apr-Jul	-	-	-
	Osprey	Nesting			-													Mar-Aug	-	-	-
	Brant	Wintering			100S													-	-	-	-
	Gadwall	Wintering			10S													-	-	-	-
	Long-tailed duck	Wintering			10S													-	-	-	-
	Mergansers	Wintering			10S													-	-	-	-
	Scoters	Wintering			100S													-	-	-	-
	Scoters	Wintering			10,000S													-	-	-	-

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																	-	-	-	Aug-Nov	Feb-Apr
	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	American shad	Migration			-													-	-	-	-	Jan-Dec
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Mar-Jun
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	Striped bass	Migration			-													-	-	-	-	Feb-Jun
	Atl. sharpnose shark	Nursery Area			-													-	-	-	Jun-Sep	Jun-Sep
	Marine Pelagic	Nursery Area			-													-	-	-	May-Sep	May-Sep
					-													-	-	-	-	-


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																	May-Aug	-	-	Apr-Oct	Apr-Oct
	Diamondback terrapin	Concentration Area			High													May-Aug	-	-	Apr-Oct	Apr-Oct
	Diamondback terrapin	Concentration Area			Very High													-	-	-	May-Dec*	-
	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	Jul-Oct	-
	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	May-Jun	May-Jun
	K. ridley sea turtle	General Distribution	E/E	E	Abundant													-	-	-	Apr-Oct	-
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	-	Apr-Oct*	Apr-Oct*
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Rare													-	-	-	May-Jun	May-Jun
	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	Mar-Dec*	Mar-Dec*
	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	-	-

REPTILES & AMPHIBIANS (continued)

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				
	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	General Distribution	T/T	T	Very Abundant												-	-	-	May-Jun	May-Jun
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution	T/T	T	Rare												-	-	-	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-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	-
	Grebes													-	-	-	-
	Common tern													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Marsh wren													-	-	-	-
	Nelson's sharp-tailed sparrow													-	Sep-Jun	-	-
	Saltmarsh sharp-tailed sparrow													-	-	-	-
	Seaside sparrow													May-Jul	-	-	-
	Storm-petrels													-	-	-	-
	Bald eagle													-	-	-	-
	Short-billed dowitcher													-	Mar-Jun	Jul-Oct	-
	Clapper rail													Apr-Sep	-	-	-
	Virginia rail													-	-	-	-

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													Feb-Apr	Feb-Apr	Feb-Apr	Jan-May	Feb-Apr
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	Jan-Oct	Mar-Jun
Estuarine Nursery	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 herring													-	-	-	Feb-Jun	Feb-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													-	-	-	-	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	Apr-Sep	Jan-Dec	Jan-Dec
	Silversides													-	-	-	-	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Clearnose skate													-	-	-	-	Jun-Dec
	Clearnose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Jan-Dec
	Cobia													-	-	-	-	Mar-Nov
	Harvestfish													-	-	-	-	Jun-Sep
														-	-	-	-	May-Nov





FISH (continued)

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Lined seahorse																Jan-Dec
	Spanish mackerel																May-Sep
	Spiny dogfish																Nov-May



REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Interest	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													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-
	Short-beaked common dolphin													-	-	-	-
	Gray seal													-	-	-	-
	Harbor seal													-	-	-	-

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	3,040.12	4.75
10B	Freshwater Marshes	35.65	0.06
10C	Swamps	543.08	0.85
10D	Scrub and Shrub Wetlands	104.76	0.16
9A	Sheltered Tidal Flats	8.89	0.01
7	Exposed Tidal Flats	131.02	0.20

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	185,312.75	115.15	61%
10C	Swamps	4,885.74	3.04	2%
10D	Scrub and Shrub Wetlands	7,379.39	4.59	2%
9A	Sheltered Tidal Flats	18,171.66	11.29	6%
9B	Vegetated Low Banks	6,556.36	4.07	2%
8B	Sheltered, Solid Man-Made Structures	22,040.34	13.70	7%
8C	Sheltered Riprap	5,325.04	3.31	2%
7	Exposed Tidal Flats	27,917.69	17.35	9%
6B	Riprap	3,954.03	2.46	1%
4	Coarse Grained Sand Beaches	281.97	0.18	< 1%
3A	Fine to Medium Grained Sand Beaches	19,954.85	12.40	7%
1B	Exposed, Solid Man-Made Structures	947.70	0.59	< 1%

Total ESI Shoreline: 302,727.53 Total ESI Shoreline: 188.11
 Total Shoreline: 235,813.31 Total Shoreline: 146.53

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 88B
Chesapeake South

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									
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				
209	Shorebird	American oystercatcher	Nesting				-													Apr-Aug	-	-	-
314	Gull/Tern	Black skimmer	Nesting			E/-	215 Pairs													May-Sep	-	-	-
	Gull/Tern	Common tern	Nesting				1158 Pairs													May-Aug	-	-	-
	Gull/Tern	G. black-backed gull	Nesting				6 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Gull-billed tern	Nesting			E/T	39 Pairs													May-Jul	-	-	-
	Gull/Tern	Herring gull	Nesting				43 Pairs													May-Aug	-	-	-
	Gull/Tern	Laughing gull	Nesting				1892 Pairs													Apr-Aug	-	-	-
	Gull/Tern	Royal tern	Nesting			E/-	5188 Pairs													May-Aug	-	-	-
798	Raptor	Sandwich tern	Nesting				23 Pairs													May-Jul	-	-	-
909	Waterfowl	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Scaup	Wintering				100S													-	-	-	-
1175	Waterfowl	American black duck	Wintering				Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Scoters	Wintering				10S													-	-	-	-



INVERTEBRATES

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					
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				
	Common loon	Wintering			100S													-	-	-	-
	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
	D. crested cormorant	Wintering			100S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			100S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Northern gannet	Wintering			100S													-	-	-	-
	Long-tailed duck	Wintering			Present													-	-	-	-
	Scoters	Wintering			10,000S													-	-	-	-

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			-													-	-	-	Aug-Nov	Feb-Apr
	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Atlantic sturgeon	Migration	-/E	E	Spring Run Migration													-	-	-	-	Apr-May
	Atlantic sturgeon	Migration	-/E	E	Fall Run Migration													-	-	-	-	Jun-Nov
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	Striped bass	Migration			-													-	-	-	-	Feb-Jun
	Striped bass	Nursery Area			-													-	-	Mar-May	Jan-Dec	-
	Atl. sharpnose shark	Nursery Area			-													-	-	-	Jun-Sep	Jun-Sep
	Sandbar shark	Nursery Area			-													-	-	-	May-Sep	May-Sep


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*	-
	K. ridley sea turtle	General Distribution	E/E	E	Abundant													-	-	-	May-Jun	May-Jun
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	-	Apr-Oct*	Apr-Oct*
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	-	Apr-Oct	-
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Rare													-	-	-	Nov-Dec	-
	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	-	Apr-Oct*	Apr-Oct*
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Rare													-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T	Very Abundant													-	-	-	May-Jun	May-Jun

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		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	-/E	E	Rare														-	-	
	Whale	Humpback whale	E/E	E	Uncommon														-	-	
		Humpback whale	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													-	-	-	-
	D. crested cormorant													-	-	-	-
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	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													-	-	-	Feb-Jun	Feb-Jun
	Atlantic herring													-	-	-	Jan-Jun	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





FISH (continued)

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



REPTILES & AMPHIBIANS

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

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
Bivalve	Eastern oyster	J	F	M	A	M	J	J	A	S	O	N	D	Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Eastern oyster																	
	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	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-
	Short-beaked common dolphin													-	-	-	-
	Gray seal													-	-	-	-
	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		
ESI Rank	Habitat Classification	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	71.10
10B	Freshwater Marshes	18.81
10C	Swamps	4.79
10D	Scrub and Shrub Wetlands	11.20
7	Exposed Tidal Flats	1.94

ESI SHORELINE HABITAT TYPES		
ESI Rank	Shoreline Habitat Classification	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	11%
10C	Swamps	1%
10D	Scrub and Shrub Wetlands	1%
9A	Sheltered Tidal Flats	5%
9B	Vegetated Low Banks	6%
8B	Sheltered, Solid Man-Made Structures	12%
8C	Sheltered Riprap	8%
7	Exposed Tidal Flats	10%
6B	Riprap	18%
4	Coarse Grained Sand Beaches	< 1%
3A	Fine to Medium Grained Sand Beaches	14%
1B	Exposed, Solid Man-Made Structures	15%

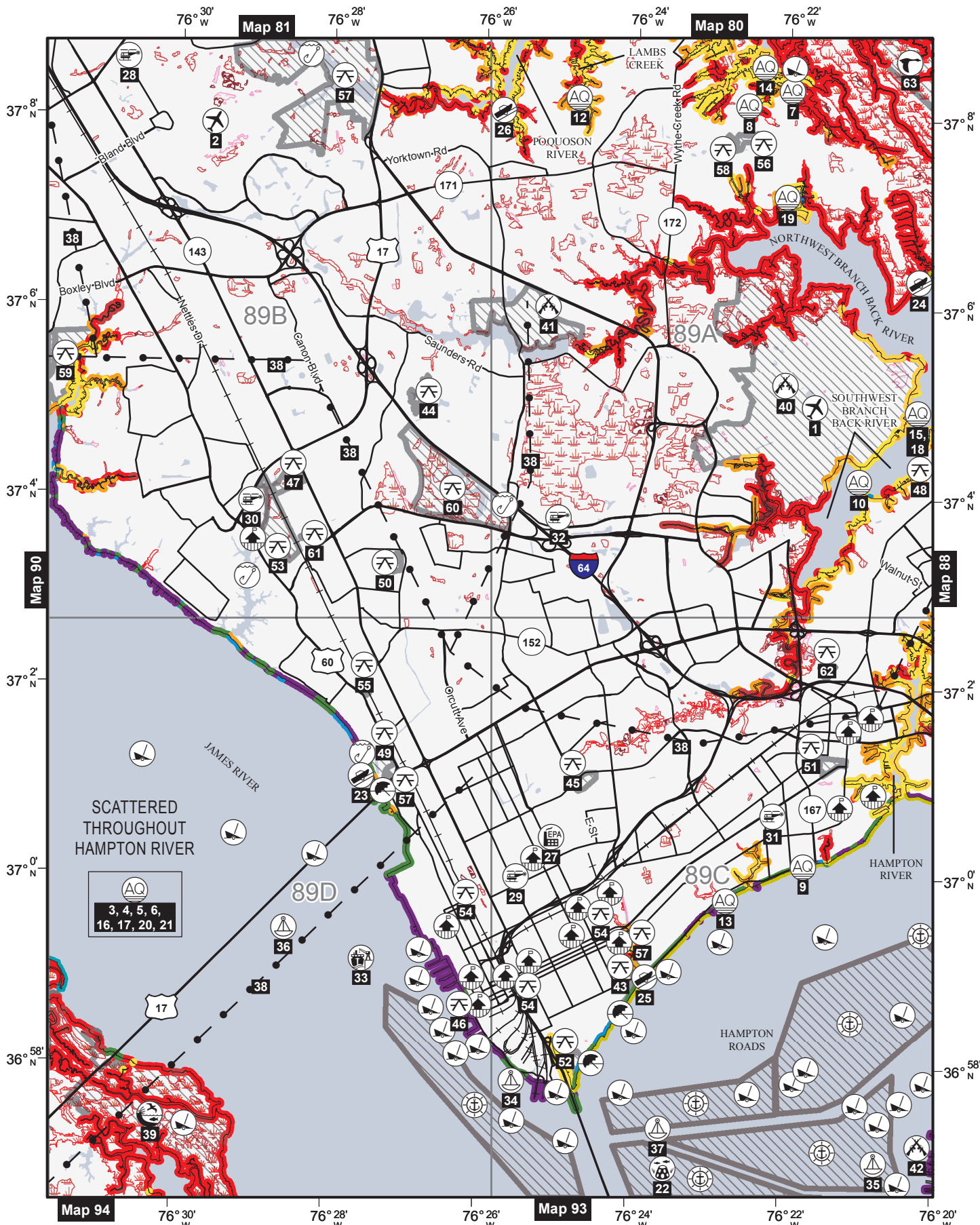
Total ESI Shoreline: 101,791.42
Total Shoreline: 81,141.52

Total ESI Shoreline: 63.25
Total Shoreline: 50.42

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 89 Chesapeake South



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 89
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				Contact		Phone
Map ID	Type	Name				
1	AIRPORT	LANGLEY AFB				
2	AIRPORT	NEWPORT NEWS/WILLIAMSBURG INTL				
3	AQUACULTURE	OYSTER NON-COMM BANE RF#00-0964		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
4	AQUACULTURE	OYSTER NON-COMM BROWN RF#00-2291		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
5	AQUACULTURE	OYSTER NON-COMM CITY OF HAMPTON RF#98-2271		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
6	AQUACULTURE	OYSTER NON-COMM CITY OF HAMPTON RF#99-1496		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
7	AQUACULTURE	OYSTER NON-COMM DEANS, THOMAS E. RF#99-1917		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
8	AQUACULTURE	OYSTER NON-COMM DEEPAK, PAT RF#99-1730		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
9	AQUACULTURE	OYSTER NON-COMM GREEN, MELISSA RF#00-0971		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
10	AQUACULTURE	OYSTER NON-COMM HAMPTON PUBLIC WORKS RF#00-0123		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
11	AQUACULTURE	OYSTER NON-COMM HARPER RF#00-0963		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
12	AQUACULTURE	OYSTER NON-COMM HEYMAN, ART RF#99-1742		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
13	AQUACULTURE	OYSTER NON-COMM MAIDA RF#00-2293		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
14	AQUACULTURE	OYSTER NON-COMM MERECE, EDWARD RF#99-1086		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
15	AQUACULTURE	OYSTER NON-COMM MEYERS RF#00-0231		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
16	AQUACULTURE	OYSTER NON-COMM POWELL RF#00-0962		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
17	AQUACULTURE	OYSTER NON-COMM RADISSON MARINA RF#00-0970		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
18	AQUACULTURE	OYSTER NON-COMM RYAN RF#98-1633		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
19	AQUACULTURE	OYSTER NON-COMM SCANLON RF#01-1181		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
20	AQUACULTURE	OYSTER NON-COMM STIEFFEN RF#00-0961		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
21	AQUACULTURE	OYSTER NON-COMM TAYLOR, NANCY RF#00-0959		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.		757-247-2254
22	ARTIFICIAL REEF	MIDDLE GROUND				
23	BOAT RAMP	HUNTINGTON PARK		VIRGINIA DEPT. OF GAME AND INLAND FISHERIES		804-367-1000
24	BOAT RAMP	MESSICK		LENE PENNINGTON, VDGIF		804-367-0058
25	BOAT RAMP	PETERSON YATCH BASIN		LENE PENNINGTON, VDGIF		804-367-0058
26	BOAT RAMP	TIDE MILL		VIRGINIA DEPT. OF GAME AND INLAND FISHERIES		804-367-1000
27	EPA FACILITY	MARVA MAID DAIRY		EHS MANAGER - OPERATIONS		443-695-4011
28	HELIPORT	MARY IMMACULATE HOSPITAL				
29	HELIPORT	NEWPORT NEWS GENERAL HOSPITAL				
30	HELIPORT	RIVERSIDE HOSPITAL				
31	HELIPORT	SENTARA HAMPTON GENERAL HOSPITAL				
32	HELIPORT	THOMAS NELSON COMMUNITY COLLEGE				
33	PORT	PORT OF NEWPORT NEWS				
34	REPEATED MEASUREMENT SITE	DB - NOS, 8638511 - DOMINION TERMINAL ASSOCIATION		NATIONAL COASTAL DATA DEVELOPMENT CENTER		866-732-2382
35	REPEATED MEASUREMENT SITE	WQ - STATION EL1		CHESAPEAKE BAY PROGRAM		800-968-7229
36	REPEATED MEASUREMENT SITE	WQ - STATION LE5.3		CHESAPEAKE BAY PROGRAM		800-968-7229
37	REPEATED MEASUREMENT SITE	WQ - STATION LE5.4		CHESAPEAKE BAY PROGRAM		800-968-7229

DISPLAYED ON MAP (LINES)			
Map ID	Type	Name	Contact
38	PIPELINE	PIPELINE	Phone
DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Contact
39	MANAGEMENT AREA	RAGGED ISLAND WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES
40	MILITARY	LANGLEY AFB	
41	MILITARY	LANGLEY FAMILY HOUSING ANNEX	
42	MILITARY	NAVAL STATION NORFOLK	
43	PARK	ANDERSON PARK	CITY OF NEWPORT NEWS
44	PARK	BEECHLAKE PARK	CITY OF NEWPORT NEWS
45	PARK	BRIARFIELD PARK	CITY OF HAMPTON
46	PARK	CHRISTOPHER NEWPORT PARK	CITY OF NEWPORT NEWS
47	PARK	DEER PARK	CITY OF NEWPORT NEWS
48	PARK	GOSNOLDS HOPE PARK	CITY OF HAMPTON
49	PARK	HUNTINGTON PARK	CITY OF NEWPORT NEWS
50	PARK	IVY FARMS PARK	CITY OF NEWPORT NEWS
51	PARK	JAMES M. EASON PARK	CITY OF HAMPTON
52	PARK	KING-LINCOLN PARK	CITY OF NEWPORT NEWS
53	PARK	LAKE MAURY NATURAL PARK	CITY OF NEWPORT NEWS
54	PARK	LOCAL PARK	CITY OF NEWPORT NEWS
55	PARK	MUNICIPAL LANE PARK	CITY OF NEWPORT NEWS
56	PARK	MUNICIPAL PARK	CITY OF POQUOSON
57	PARK	NEWPORT NEWS CITY PARK	CITY OF NEWPORT NEWS
58	PARK	PHILLIPS PARK	CITY OF POQUOSON
59	PARK	RIVERVIEW FARM PARK	CITY OF NEWPORT NEWS
60	PARK	SANDY BOTTOM NATURE PARK	CITY OF HAMPTON
61	PARK	TEAR DROP PARK	CITY OF NEWPORT NEWS
62	PARK	YH THOMAS PARK	CITY OF HAMPTON
63	WILDLIFE REFUGE	PLUM TREE ISLAND NWR	UNITED STATES FISH AND WILDLIFE SERVICE

JURISDICTIONS


COUNTY: HAMP. CTY, I. OF WGT CO., N. N. CTY, NORF. CTY, POQ. CTY, PORTSM. CTY, YRK CO. **FEMA:** REGION I
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS **EPA:** REGION 3
USACE: NORTH ATLANTIC DIVISION, NORFOLK DISTRICT

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

	ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
	10A	Salt and Brackish Water Marshes	4,484.43	7.01
	10B	Freshwater Marshes	169.94	0.27
	10C	Swamps	3,156.18	4.93
	10D	Scrub and Shrub Wetlands	182.11	0.28

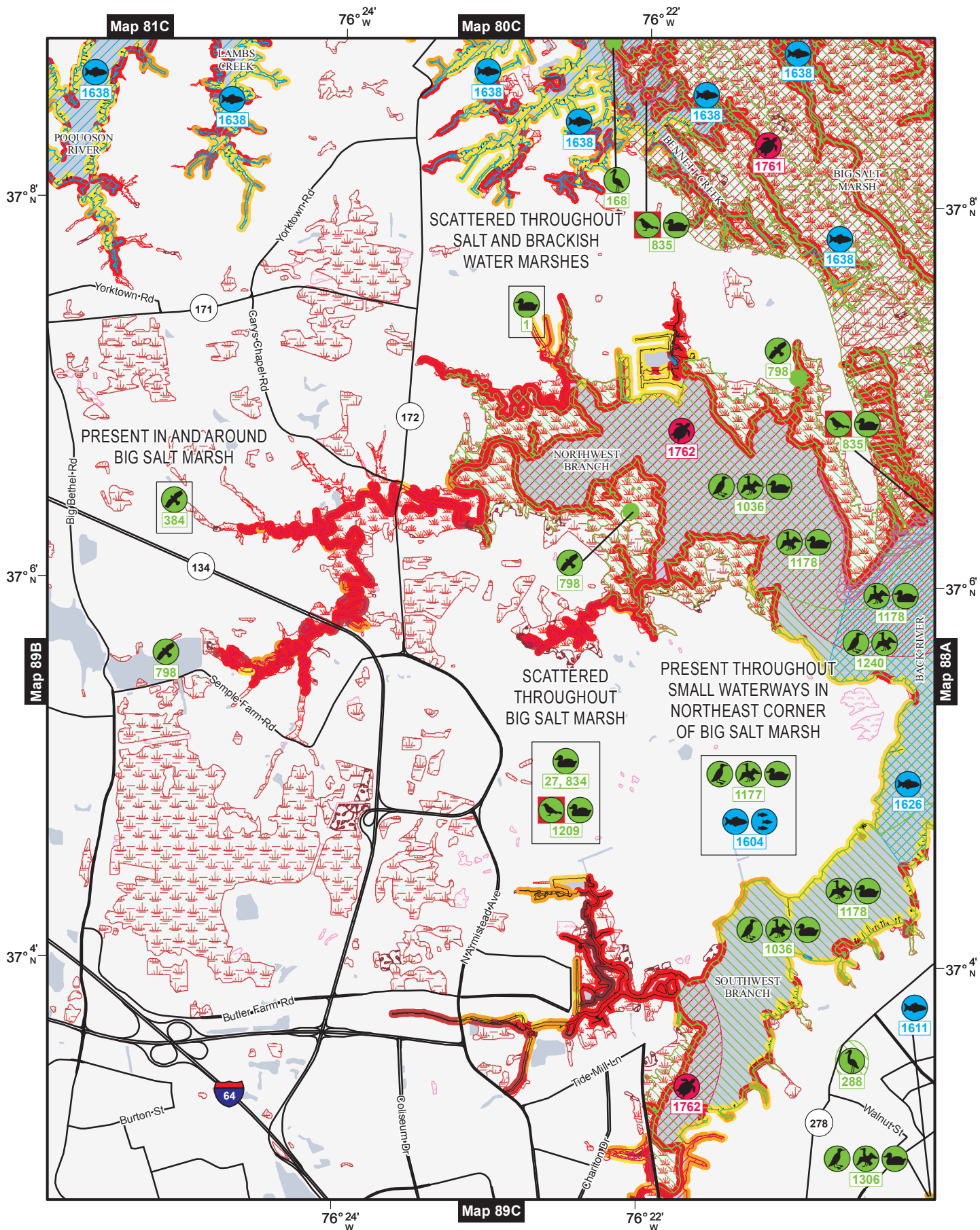
ESI SHORELINE HABITAT TYPES

	ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
	10A	Salt and Brackish Water Marshes	249,708.87	155.16	56%
	10C	Swamps	18,364.23	11.41	4%
	10D	Scrub and Shrub Wetlands	4,413.67	2.74	1%
	9A	Sheltered Tidal Flats	29.58	0.02	< 1%
	9B	Vegetated Low Banks	32,527.60	20.21	7%
	8B	Sheltered, Solid Man-Made Structures	48,300.83	30.01	11%
	8C	Sheltered Riprap	31,816.09	19.77	7%
	7	Exposed Tidal Flats	10,729.75	6.67	2%
	6B	Riprap	17,313.64	10.76	4%
	5	Mixed Sand and Gravel Beaches	905.76	0.56	< 1%
	4	Coarse Grained Sand Beaches	6,790.17	4.22	2%
	1B	Exposed, Solid Man-Made Structures	21,470.62	13.34	5%
Total ESI Shoreline:			442,370.81	274.88	
Total Shoreline:			415,419.25	258.13	

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

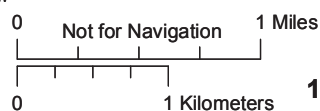




Map 89A Chesapeake South



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 89A
Chesapeake South

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												

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				
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	
27	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-	
	Waterfowl	American black duck	Wintering			10S												-	-	-	-	
	Waterfowl	Bufflehead	Wintering			10S												-	-	-	-	
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul	
	Waterfowl	Canada goose	Wintering			10S												-	-	-	-	
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug	
	Waterfowl	Mallard	Wintering			10S												-	-	-	-	
	Wading	Great blue heron	Nesting			8 Nests												Feb-Jun	-	-	-	
	Wading	Great egret	Nesting			52 Nests												Apr-Aug	-	-	-	
288	Wading	YC night-heron	Nesting			2 Pairs												Apr-Jul	-	-	-	
384	Raptor	Northern harrier	Nesting			-												Apr-Jul	-	-	-	
	Raptor	Osprey	Nesting			-												Mar-Aug	-	-	-	
	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-	
834	Waterfowl	American black duck	Wintering			10S												-	-	-	-	
	Waterfowl	Bufflehead	Wintering			10S												-	-	-	-	
	Waterfowl	Canada goose	Wintering			10S												-	-	-	-	
	Waterfowl	Mallard	Wintering			10S												-	-	-	-	
	Passerine	Sedge wren	General Distribution	E/-		-												-	-	-	-	
	Waterfowl	American black duck	Nesting			-												Apr-Jul	-	-	-	
	Waterfowl	American black duck	Wintering			10S												-	-	-	-	
	Waterfowl	Bufflehead	Wintering			10S												-	-	-	-	
	Waterfowl	Canada goose	Wintering			10S												-	-	-	-	
	Waterfowl	Mallard	Wintering			10S												-	-	-	-	
	Diving	Common loon	Wintering			10S												-	-	-	-	
	Diving	D. crested cormorant	Wintering			100S												-	Mar-May	Aug-Nov	-	
	Diving	Grebes	Wintering			10S												-	-	-	-	
	Pelagic	Northern gannet	Wintering			Present												-	-	-	-	
	Waterfowl	American black 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	D			
	Waterfowl	American wigeon	Wintering			10S													-	-	-
	Waterfowl	Blue-winged teal	Migration			10S													-	Feb-Apr	Aug-Oct
	Waterfowl	Bufflehead	Wintering			100S													-	-	-
	Waterfowl	Canada goose	Wintering			100S													-	-	-
	Waterfowl	Canvasback	Wintering			100S													-	-	-
	Waterfowl	Common goldeneye	Wintering			Present													-	-	-
	Waterfowl	Green-winged teal	Wintering			10S													-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-
	Waterfowl	Scaup	Wintering			10S													-	-	-
1177	Diving	Common loon	Wintering			Present													-	-	-
	Diving	Red-throated loon	Wintering			Present													-	-	-
	Pelagic	Northern gannet	Wintering			100S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Scoters	Wintering			100S													-	-	-
1178	Diving	Red-throated loon	Wintering			Present													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Scoters	Wintering			100S													-	-	-
	Passerine	Sedge wren	General Distribution			-													-	-	-
1209	Waterfowl	American black duck	Nesting			-													Apr-Jul	-	-
	Diving	Common loon	Wintering			Present													-	-	-
1306	Pelagic	Northern gannet	Wintering			100S													-	-	-
	Diving	Common loon	Wintering			100S													-	-	-
	Diving	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov
	Diving	Grebes	Wintering			100S													-	-	-
	Diving	Red-throated loon	Wintering			100S													-	-	-
	Pelagic	Northern gannet	Wintering			100S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			Present													-	-	-
	Waterfowl	Scoters	Wintering			10,000S													-	-	-

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					
1604	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	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
1611	Diadromous	Striped bass	Nursery Area			-													-	-	Mar-May	Jan-Dec	-
1626	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
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
1761	Turtle	Diamondback terrapin	Concentration Area			Very High													May-Aug	-	-	Apr-Oct	Apr-Oct
1762	Turtle	Diamondback terrapin	Concentration Area			High													May-Aug	-	-	Apr-Oct	Apr-Oct

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				
	Brant	Wintering			100S													-	-	-	-
	Gadwall	Wintering			10S													-	-	-	-
	Mergansers	Wintering			10S													-	-	-	-

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
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Blueback herring	Migration			-													-	-	-	Aug-Nov	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					
	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	-
	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-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					
	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													-	-	-	-





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	-
	Grebes													-	-	-	-
	Common tern													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Marsh wren													-	-	-	-
	Nelson's sharp-tailed sparrow													-	Sep-Jun	-	-
	Saltmarsh sharp-tailed sparrow													-	-	-	-
	Seaside sparrow													May-Jul	-	-	-
	Bald eagle													-	-	-	-
	Raptor													-	-	-	-
	Shorebird													-	Mar-Jun	Jul-Oct	-
	Clapper rail													Apr-Sep	-	-	-
	Virginia rail													-	-	-	-

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													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	Dec-Apr	Jan-Dec	Jan-Nov
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Feb-Jun	Feb-Jun
	Black drum													Apr-Jun	-	-	Jan-Dec	Jan-Dec
	Black sea bass													-	-	-	Apr-Dec	Apr-Dec
	Bluefish													-	-	-	Apr-Nov	Apr-Nov
	Kingfishes													-	-	-	May-Oct	May-Oct
	Northern puffer													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	Mar-Oct	Mar-Oct
	Red drum													-	-	-	-	Apr-Nov
	Sheepshead													-	-	-	-	May-Nov
	Spot													-	-	-	-	Apr-Nov
	Spotted seatrout													May-Jul	-	-	Nov-Apr	Apr-Dec
	Summer flounder													-	-	Feb-May	Apr-Dec	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					
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													-	-	-	-	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Clearnose skate													-	-	-	-	Jan-Dec
	Clearnose skate													-	-	-	-	Jun-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
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep
	Spiny dogfish													-	-	-	Nov-May	Nov-May
														-	-	-	-	-
														-	-	-	-	-
														-	-	-	-	-








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				
	Bivalve																
	Eastern oyster																
	Hard clam																
	Softshell clam																
	Cephalopod																
	Stout razor clam																
	Crab																
	Squid																
	Shrimp																
	Blue crab																
	Shrimp																
	Horseshoe crab																
	Shrimp																
	Brown shrimp																
	Shrimp																
	Mantis shrimp																
	Shrimp																
	White shrimp																

MARINE MAMMALS

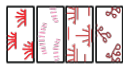
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Dolphin																
	Bottlenose dolphin																
	Dolphin																
	Bottlenose dolphin																
	Dolphin																
	Bottlenose dolphin																
	Dolphin																
	Harbor porpoise																
	Dolphin																
	Short-beaked common dolphin																
	Seal																
	Gray seal																
	Seal																
	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	2,731.41	4.27
10B	Freshwater Marshes	81.10	0.13
10C	Swamps	2,143.54	3.35
10D	Scrub and Shrub Wetlands	98.56	0.15



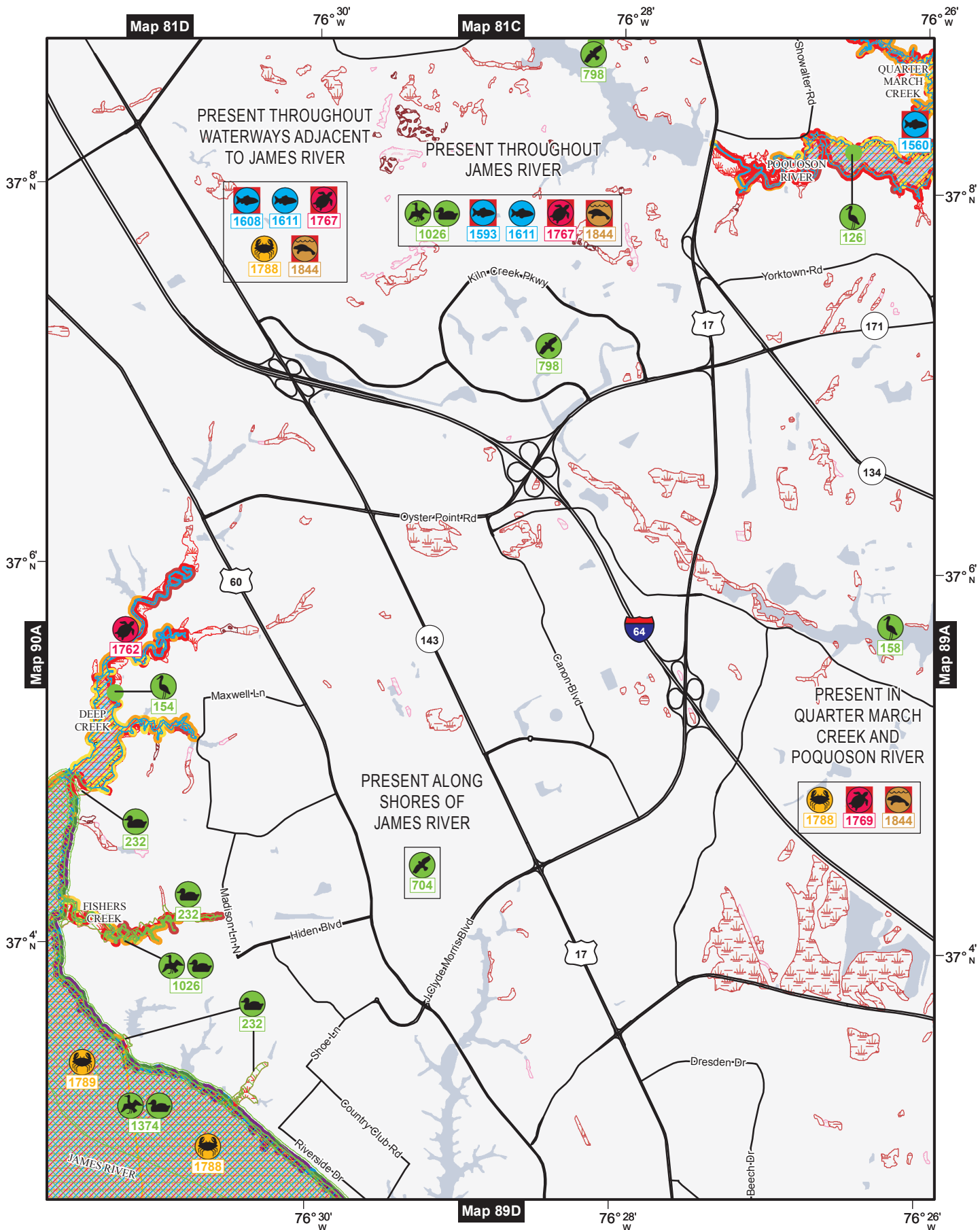
ESI SHORELINE HABITAT TYPES

<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	164,739.38	102.36	67%
10C	Swamps	11,013.26	6.84	4%
10D	Scrub and Shrub Wetlands	3,981.29	2.47	2%
9A	Sheltered Tidal Flats	29.58	0.02	< 1%
9B	Vegetated Low Banks	16,095.54	10.00	7%
8B	Sheltered, Solid Man-Made Structures	28,228.57	17.54	11%
8C	Sheltered Riprap	21,539.08	13.38	9%
7	Exposed Tidal Flats	134.07	0.08	< 1%
4	Coarse Grained Sand Beaches	192.79	0.12	< 1%
		Total ESI Shoreline:	245,953.56	Total ESI Shoreline: 152.83
		Total Shoreline:	240,060.95	Total Shoreline: 149.17

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

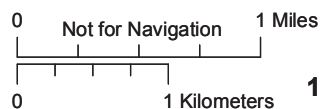




Map 89B Chesapeake South



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 89B
Chesapeake South

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BIRDS

[illegible]

FISH

[illegible]

258

Chesapeake South: Map 89B

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	Rare												-	-	-	May-Dec*	-
1769	Turtle	Green sea turtle	General Distribution	T/T	T	Common												-	-	-	Jul-Oct	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Common												-	-	-	Jul-Oct	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Rare												-	-	-	May-Dec*	-
	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	Leatherback sea turtle	General Distribution	E/E	E	Common												-	-	-	May-Jun	May-Jun
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Rare												-	-	-	Mar-Dec*	Mar-Dec*
	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
1789	Crab	Blue crab	Concentration Area			Highly Abundant												-	-	-	Jun-Mar*	Jun-Mar*

MARINE MAMMALS



Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
				S	F	Concentration															
1844	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													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Osprey													-	-	-	-

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
	Estuarine Nursery													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct

Chesapeake South: Map 89B

FISH (continued)

Map ID	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				
		Atlantic herring																	-	-	Feb-Jun	Feb-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
🐟	Estuarine Resident	Pipefish																-	-	-	Jan-Dec	Jan-Dec
		Silversides																-	-	-	-	Jan-Dec
🐟	Fish	Silversides																Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
		Anchovies																Apr-Sep	-	-	-	Jan-Dec
		Striped burrfish																-	-	-	May-Oct	May-Oct
🐟	Freshwater	Blue catfish																May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
		Bullhead catfish																Apr-Jun	-	-	-	Jan-Dec
🐟	Marine Benthic	Atlantic spadefish																-	-	-	-	Jun-Sep
		Cleannose skate																-	-	-	-	Jan-Dec
		Cownose ray																Jun-Jul	-	-	May-Oct	May-Oct
		Northern searobin																May-Jul	-	-	-	Apr-Dec
		Northern searobin																-	-	-	-	Apr-Sep
		Red hake																-	-	-	-	Sep-May*
		Silver hake																-	-	-	-	Oct-May
		Southern stingray																-	-	-	-	May-Oct
		Spotted hake																-	-	-	Jan-Dec	Jan-Dec
		Tautog																Apr-Aug	-	-	-	Jan-Dec
🐟	Marine Pelagic	Butterfish																-	-	-	Jul-Nov	Mar-Nov
		Cobia																-	-	-	-	Jun-Sep
		Harvestfish																-	-	-	-	May-Nov
		Lined seahorse																May-Oct	-	-	-	Jan-Dec
		Spanish mackerel																-	-	-	-	May-Sep
		Spiny dogfish																-	-	-	Nov-May	Nov-May

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
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

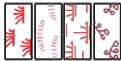
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-

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	186.08	0.29
10B	Freshwater Marshes	54.22	0.08
10C	Swamps	655.37	1.02
10D	Scrub and Shrub Wetlands	36.18	0.06



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	27,057.35	16.81	50%
10C	Swamps	3,322.34	2.06	6%
9B	Vegetated Low Banks	6,732.87	4.18	13%
8B	Sheltered, Solid Man-Made Structures	5,195.28	3.23	10%
8C	Sheltered Riprap	1,214.09	0.75	2%
6B	Riprap	3,627.13	2.25	7%
4	Coarse Grained Sand Beaches	3,023.73	1.88	6%
1B	Exposed, Solid Man-Made Structures	3,676.26	2.28	7%

Total ESI Shoreline: 53,849.05 Total ESI Shoreline: 33.46
 Total Shoreline: 48,564.01 Total Shoreline: 30.18

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 89C
Chesapeake South

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				
295	Wading	Green heron	Nesting			2 Pairs													Apr-Aug	-	-	-
	Wading	YC night-heron	Nesting			3 Pairs													Apr-Jul	-	-	-
297	Wading	Green heron	Nesting			2 Pairs													Apr-Aug	-	-	-
	Wading	YC night-heron	Nesting			6 Pairs													Apr-Jul	-	-	-
299	Wading	YC night-heron	Nesting			7 Pairs													Apr-Jul	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest													Dec-Jun	-	-	-

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					
1548	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	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					
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					
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	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Common loon	Wintering			100S													-	-	-	-	-
	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-	-
	Grebes	Wintering			100S													-	-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-	-
	Northern gannet	Wintering			100S													-	-	-	-	-
	Long-tailed duck	Wintering			Present													-	-	-	-	-
	Scooters	Wintering			10,000S													-	-	-	-	-

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			-													-	-	-	Aug-Nov	Feb-Apr
	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Atlantic sturgeon	Migration	-/E	E	Spring Run Migration													-	-	-	-	Apr-May
	Atlantic sturgeon	Migration	-/E	E	Fall Run Migration													-	-	-	-	Jun-Nov
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	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*	-
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	-	Apr-Oct	-
	Leatherback sea turtle	General Distribution	E/E	E	Uncommon													-	-	-	Nov-Dec	-
	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	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	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													-	-	-	-
	Humpback whale	General Distribution	E/E	E	Uncommon													-	-	-	-

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													-	-	-	-	-
	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-Nov
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic herring													-	-	-	Feb-Jun	Feb-Jun
	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													-	-	-	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													-	-	-	-	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleamose skate													-	-	-	-	Jan-Dec
	Cleamose skate													-	-	-	-	Jan-Dec
	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					
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	-	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep
	Spiny dogfish													-	-	-	-	Nov-May

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Interest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Turtle	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					
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	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
Shrimp	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

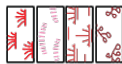
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
Dolphin	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

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	270.02	0.42
10B	Freshwater Marshes	32.58	0.05
10C	Swamps	111.99	0.17
10D	Scrub and Shrub Wetlands	40.34	0.06



ESI SHORELINE HABITAT TYPES

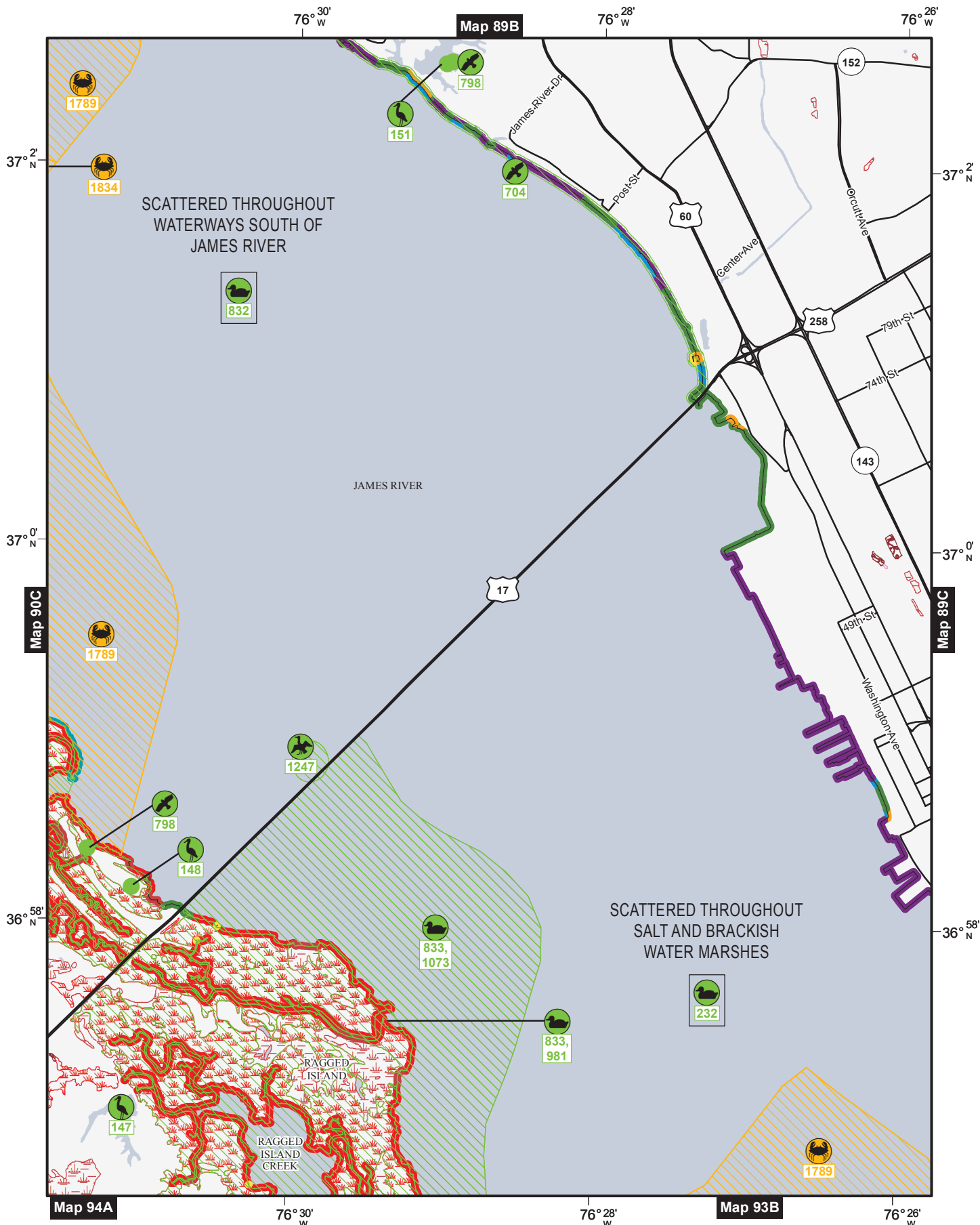
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	13,080.90	8.13	17%
10C	Swamps	2,612.25	1.62	3%
10D	Scrub and Shrub Wetlands	426.03	0.26	1%
9B	Vegetated Low Banks	9,116.00	5.66	12%
8B	Sheltered, Solid Man-Made Structures	14,684.60	9.12	19%
8C	Sheltered Riprap	9,062.92	5.63	12%
7	Exposed Tidal Flats	10,595.68	6.58	14%
6B	Riprap	8,737.58	5.43	11%
4	Coarse Grained Sand Beaches	1,796.42	1.12	2%
1B	Exposed, Solid Man-Made Structures	6,280.37	3.90	8%

Total ESI Shoreline: 76,392.76 Total ESI Shoreline: 47.47
 Total Shoreline: 63,003.93 Total Shoreline: 39.15

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 89D
Chesapeake South

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				
147	Wading	Great blue heron	Nesting		17 Nests													Feb-Jun	-	-	-
148	Wading	Great blue heron	Nesting		32 Nests													Feb-Jun	-	-	-
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
704	Raptor	Bald eagle	Concentration Area		Moderate-High													-	-	-	-
798	Raptor	Bald eagle	Nesting		1 Nest													Dec-Jun	-	-	-
832	Waterfowl	American black duck	Wintering		Present													-	-	-	-
	Waterfowl	Blue-winged teal	Migration		10S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering		10S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering		Present													-	-	-	-
	Waterfowl	Green-winged teal	Wintering		10S													-	-	-	-
	Waterfowl	Mallard	Wintering		10S													-	-	-	-
833	Waterfowl	Bufflehead	Wintering		10S													-	-	-	-
	Waterfowl	Mallard	Wintering		10S													-	-	-	-
981	Waterfowl	American black duck	Wintering		Present													-	-	-	-
	Waterfowl	Blue-winged teal	Migration		10S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Common goldeneye	Wintering		Present													-	-	-	-
	Waterfowl	Green-winged teal	Wintering		10S													-	-	-	-
1073	Waterfowl	Canvasback	Wintering		1,000S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering		1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering		100S													-	-	-	-
1247	Diving	D. crested cormorant	Nesting		183 Pairs													May-Aug	-	-	-


INVERTEBRATES

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	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		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
	Common loon	Wintering			100S												-	-	-	-
	Common loon	Wintering			10S												-	-	-	-
	D. crested cormorant	Wintering			1,000S												-	Mar-May	Aug-Nov	-
	Grebes	Wintering			100S												-	-	-	-
	Red-throated loon	Wintering			100S												-	-	-	-
 	Red-throated loon	Wintering			10S												-	-	-	-
	Northern gannet	Wintering			100S												-	-	-	-
	Bufflehead	Wintering			100S												-	-	-	-
	Canada goose	Wintering			10S												-	-	-	-
	Canvasback	Wintering			100S												-	-	-	-
	Long-tailed duck	Wintering			Present												-	-	-	-
	Mergansers	Wintering			Present												-	-	-	-
	Ruddy duck	Wintering			100S												-	-	-	-
	Sooters	Wintering			10,000S												-	-	-	-
	Sooters	Wintering			10S												-	-	-	-

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			-													-	-	-	Aug-Nov	Feb-Apr
	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Atlantic sturgeon	Concentration Area	-/E	E	High													-	-	-	Jan-Dec	Jan-Dec
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Atlantic sturgeon	Migration	-/E	E	Fall Run Migration													-	-	-	-	Jun-Nov
	Atlantic sturgeon	Migration	-/E	E	Spring Run Migration													-	-	-	-	Apr-May
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	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	Rare													-	-	-	May-Dec*	-
	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	Jul-Oct	-
	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	-	Apr-Oct	-
	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	-	Nov-Dec	-
	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	-	Nov-Dec	Nov-Dec

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/VFA		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													-	-	-	-
Gull/Tern	Gulls													-	-	-	-
	Terns													-	-	-	-
Raptor	Osprey													-	-	-	-

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
	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
	Winter flounder													-	-	-	-	Dec-Mar
Estuarine Resident	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	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					
	Fish													Apr-Sep	-	-	-	Jan-Dec
	Freshwater													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleamose skate													-	-	-	-	Jun-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	-	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Interest	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
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

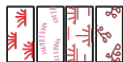
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-

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	1,296.91	2.03
10B	Freshwater Marshes	2.04	0.00
10C	Swamps	245.27	0.38
10D	Scrub and Shrub Wetlands	7.03	0.01



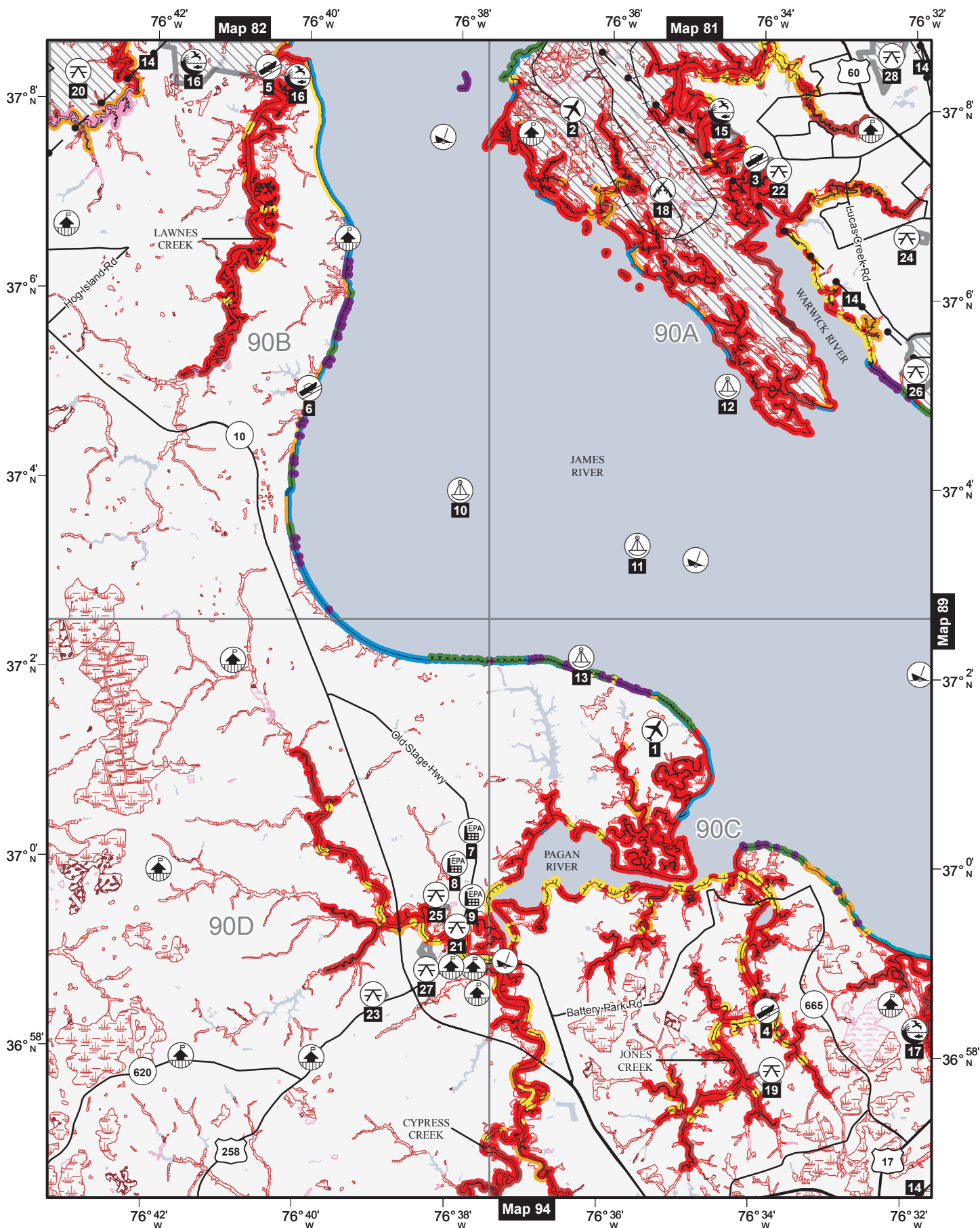
ESI SHORELINE HABITAT TYPES

<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	44,831.23	27.86	68%
10C	Swamps	1,416.38	0.88	2%
10D	Scrub and Shrub Wetlands	6.35	0.00	< 1%
9B	Vegetated Low Banks	583.18	0.36	1%
8B	Sheltered, Solid Man-Made Structures	192.38	0.12	< 1%
6B	Riprap	4,948.94	3.08	7%
5	Mixed Sand and Gravel Beaches	905.76	0.56	1%
4	Coarse Grained Sand Beaches	1,777.22	1.10	3%
1B	Exposed, Solid Man-Made Structures	11,513.99	7.15	17%
Total ESI Shoreline:		66,175.44	41.12	
Total Shoreline:		63,790.36	39.64	

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 90

Chesapeake South



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 90
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
Map ID	Type	Name	Contact
1	AIRPORT	ABERDEEN FIELD	
2	AIRPORT	FELKER AAF	
3	BOAT RAMP	DENBIGH	VIRGINIA DEPT. OF GAME AND INLAND FISHERIES
4	BOAT RAMP	JONES CREEK	LENE PENNINGTON, VDGIF
5	BOAT RAMP	LAWNES CREEK	LENE PENNINGTON, VDGIF
6	BOAT RAMP	TYLER'S BEACH	VIRGINIA DEPT. OF GAME AND INLAND FISHERIES
7	EPA FACILITY	LINEAGE LOGISTICS RCS SMITHFIELD	DIVISION MANAGER
8	EPA FACILITY	PREMIUM PET HEALTH EAST	MAINTENANCE MANAGER
9	EPA FACILITY	THE SMITHFIELD PACKING CO. INC.- NORTH	PLANT ENGINEER
10	REPEATED MEASUREMENT SITE	MWS - SITE CBJR	GREG PINIAK, PROJECT MANAGER
11	REPEATED MEASUREMENT SITE	WQ - STATION LE5.2	CHESAPEAKE BAY PROGRAM
12	REPEATED MEASUREMENT SITE	WQ - STATION LE5.2N	CHESAPEAKE BAY PROGRAM
13	REPEATED MEASUREMENT SITE	WQ - STATION LE5.2S	CHESAPEAKE BAY PROGRAM

DISPLAYED ON MAP (LINES)			
Map ID	Type	Name	Contact
14	PIPELINE	PIPELINE	COVE POINT PIPELINE

DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Contact
15	MANAGEMENT AREA	BALTHROPE MARSH WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES
16	MANAGEMENT AREA	HOG ISLAND WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES
17	MANAGEMENT AREA	RAGGED ISLAND WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES
18	MILITARY	FT EUSTIS	
19	PARK	CARROLLTON NIKE PARK	ISLE OF WIGHT PARKS AND RECREATION
20	PARK	CHIPPOKES PLANTATION STATE PARK	VA DEPT OF CONSERVATION AND RECREATION
21	PARK	CLONTZ PARK	TOWN OF SMITHFIELD
22	PARK	DENBIGH PARK	CITY OF NEWPORT NEWS
23	PARK	JERSEY PARK	ISLE OF WIGHT PARKS AND RECREATION
24	PARK	NICEWOOD PARK	CITY OF NEWPORT NEWS
25	PARK	PINEWOOD HEIGHTS PARK	TOWN OF SMITHFIELD
26	PARK	RIVERVIEW FARM PARK	CITY OF NEWPORT NEWS
27	PARK	RIVERVIEW PARK	ISLE OF WIGHT PARKS AND RECREATION
28	PARK	STONY RUN PARK	CITY OF NEWPORT NEWS

JURISDICTIONS

COUNTY: ISLE OF WIGHT COUNTY, NEWPORT NEWS CITY, SURRY COUNTY
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, NORFOLK DISTRICT

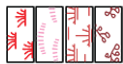
FEMA:
EPA:

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	5,630.75	8.80
10B	Freshwater Marshes	403.36	0.63
10C	Swamps	4,793.66	7.49
10D	Scrub and Shrub Wetlands	422.00	0.66



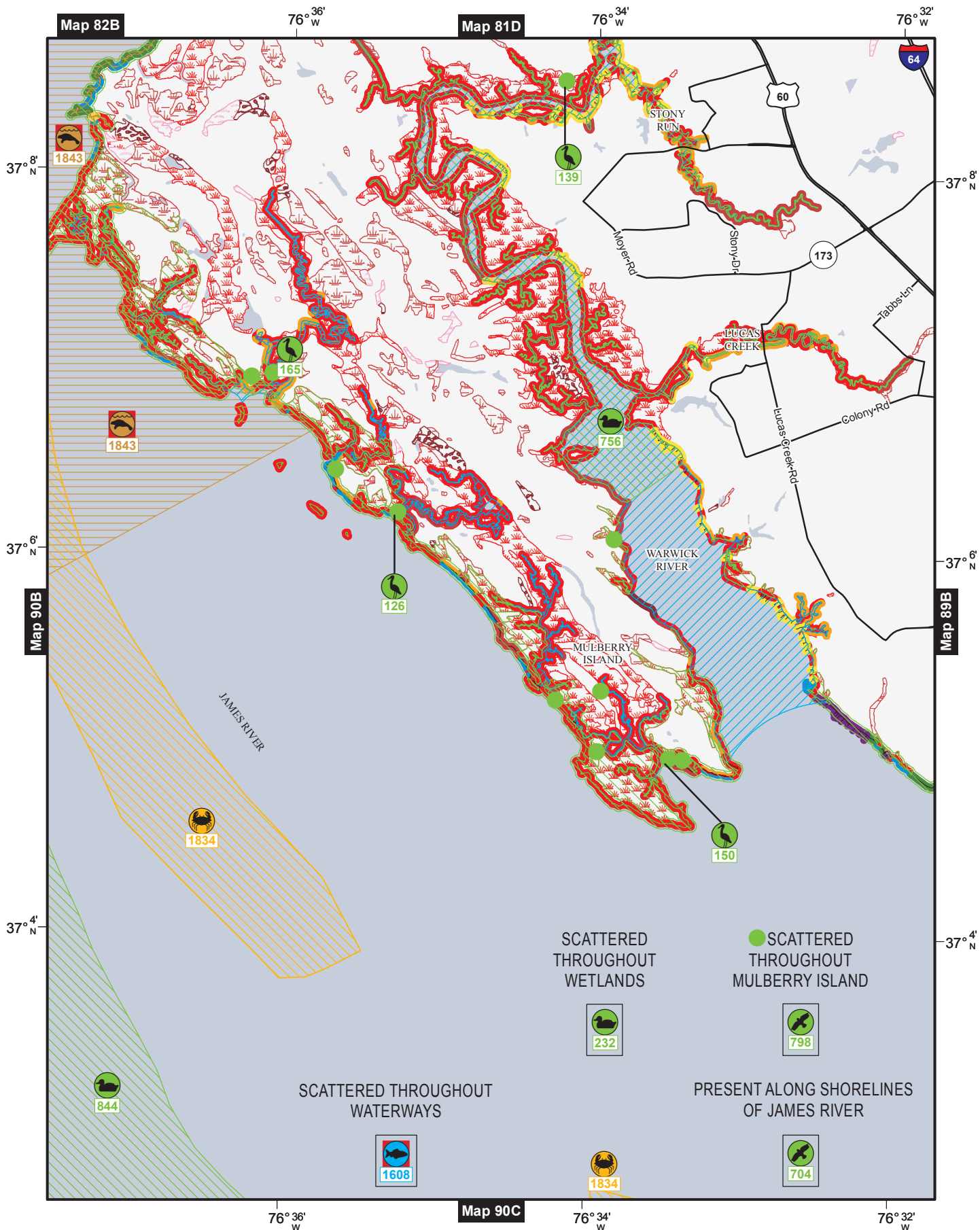
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	394,987.86	245.43	75%
10B	Freshwater Marshes	10,761.07	6.69	2%
10C	Swamps	30,393.69	18.89	6%
10D	Scrub and Shrub Wetlands	1,067.33	0.66	< 1%
9A	Sheltered Tidal Flats	303.57	0.19	< 1%
9B	Vegetated Low Banks	27,759.98	17.25	5%
8B	Sheltered, Solid Man-Made Structures	15,915.07	9.89	3%
8C	Sheltered Riprap	5,289.39	3.29	1%
6B	Riprap	8,911.91	5.54	2%
5	Mixed Sand and Gravel Beaches	2,484.63	1.54	< 1%
4	Coarse Grained Sand Beaches	23,596.01	14.66	4%
3B	Scarps and Steep Slopes (Sand)	309.42	0.19	< 1%
1B	Exposed, Solid Man-Made Structures	5,598.87	3.48	1%
Total ESI Shoreline:		527,378.79	327.70	
Total Shoreline:		472,192.55	293.41	

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 90A
Chesapeake South

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				
126	Wading	Great blue heron	Nesting		3 Nests													Feb-Jun	-	-	-
139	Wading	Great blue heron	Nesting		18 Nests													Feb-Jun	-	-	-
	Wading	Great egret	Nesting		6 Nests													Apr-Aug	-	-	-
150	Wading	Great blue heron	Nesting		10 Nests													Feb-Jun	-	-	-
165	Wading	Great blue heron	Nesting		42 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting		Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting		Present													Mar-Aug	-	-	Jul-Aug
704	Raptor	Bald eagle	Concentration Area		Moderate-High													-	-	-	-
756	Waterfowl	American black duck	Wintering		100S													-	-	-	-
	Waterfowl	Mallard	Wintering		100S													-	-	-	-
	Waterfowl	Scaup	Wintering		100S													-	-	-	-
798	Raptor	Bald eagle	Nesting		1 Nest													Dec-Jun	-	-	-
844	Waterfowl	American black duck	Wintering		10S													-	-	-	-
	Waterfowl	Canada goose	Wintering		100S													-	-	-	-
	Waterfowl	Canvasback	Wintering		1,000S													-	-	-	-
	Waterfowl	Mallard	Wintering		Present													-	-	-	-
	Waterfowl	Mergansers	Wintering		100S													-	-	-	-
	Waterfowl	Redhead	Wintering		10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering		1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering		10S													-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
1608	Diadromous	Atlantic sturgeon	General Distribution	-/E E	-	J	F	M	A	M	J	J	A	S	O	N	D	-	-	Jan-Dec	Jan-Dec	Jan-Dec
																		-	-	-	-	-



INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
1834	Crab	Blue crab	Concentration Area		Highly Abundant-Wint	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	Dec-Mar	Dec-Mar
																		-	-	-	-	-

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
1843	Manatee	West Indian manatee	General Distribution	-/E E	-	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-
																		-	-	-	-


BIRDS

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	D			
	Diving	Common loon			10S												-	-	-	-
		D. crested cormorant			1,000S												-	Mar-May	Aug-Nov	-
		Grebes			100S												-	-	-	-
		Red-throated loon			10S												-	-	-	-
		Bufflehead			100S												-	-	-	-
	Waterfowl	Canada goose			10S												-	-	-	-
		Canvasback			100S												-	-	-	-
		Long-tailed duck			Present												-	-	-	-
		Mergansers			Present												-	-	-	-
		Ruddy duck			100S												-	-	-	-
		Sooters			10S												-	-	-	-
																	-	-	-	-
																	-	-	-	-

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	High													-	-	-	Jan-Dec	Jan-Dec
		Atlantic sturgeon	-/E	E	Fall Run Migration													-	-	-	-	Jun-Nov
		Atlantic sturgeon	-/E	E	Spring Run Migration													-	-	-	-	Apr-May
		Blueback herring			-													-	-	-	Aug-Nov	Mar-Jun
		Hickory shad			-													-	-	-	Jun-Sep	Feb-May
		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	Diamondback terrapin			High													May-Aug	-	-	Apr-Oct	Apr-Oct
		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	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	-/E	E	Rare														-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)








BIRDS

Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Eggs	Larvae	Juveniles	Adults
 Diving	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
 Gull/Tern	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-
 Raptor	Osprey													-	-	-	-	-

FISH

Monthly Presence


Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
 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 menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Kingfishes													-	-	-	Apr-Nov	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Red drum													-	-	-	May-Nov	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Oct	Jan-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
 Estuarine Resident	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
 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
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
 Marine Benthic	Northern searobin													-	-	-	Apr-Sep	Apr-Sep
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
 Marine Pelagic	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

Chesapeake South: Map 90A

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
 Turtle	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					
 Bivalve	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
 Cephalopod	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
 Crab	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
 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	1,956.54	3.06
10B	Freshwater Marshes	56.12	0.09
10C	Swamps	448.94	0.70
10D	Scrub and Shrub Wetlands	83.19	0.13



ESI SHORELINE HABITAT TYPES

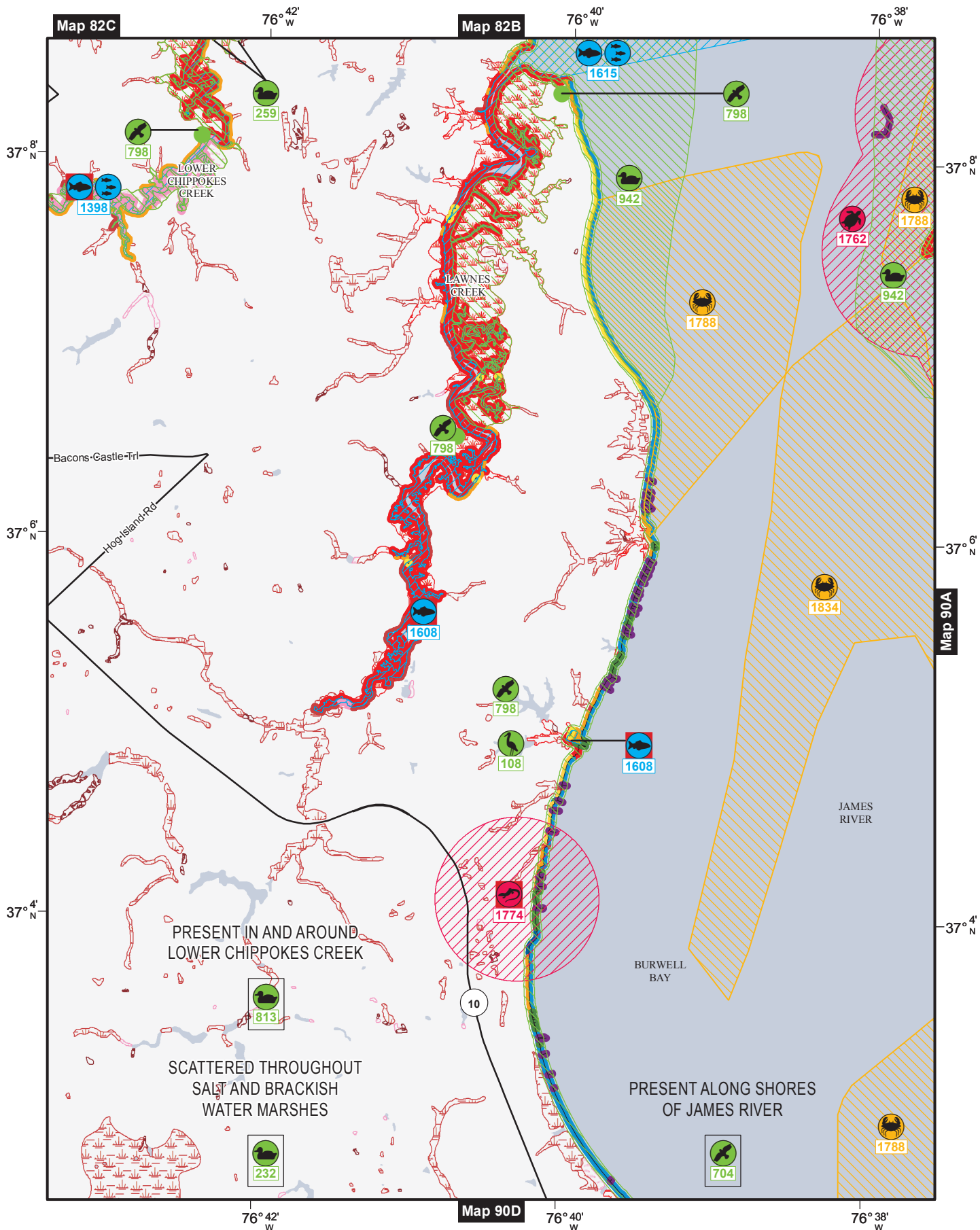
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	145,107.99	90.17	81%
10C	Swamps	10,827.88	6.73	6%
10D	Scrub and Shrub Wetlands	707.76	0.44	< 1%
9B	Vegetated Low Banks	9,485.33	5.89	5%
8B	Sheltered, Solid Man-Made Structures	4,849.53	3.01	3%
8C	Sheltered Riprap	2,412.22	1.50	1%
6B	Riprap	1,673.84	1.04	1%
4	Coarse Grained Sand Beaches	3,923.59	2.44	2%
1B	Exposed, Solid Man-Made Structures	923.76	0.57	1%

Total ESI Shoreline: 179,911.92 Total ESI Shoreline: 111.79
 Total Shoreline: 170,722.25 Total Shoreline: 106.08

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 90B Chesapeake South



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 90B
Chesapeake South

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	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
							J	F	M	A	M	J	J	A	S	O	N	D				
108	Wading	Great blue heron	Nesting			6 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
259	Waterfowl	American wigeon	Wintering			10S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			10S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering			10S													-	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Canada goose	Wintering			1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering			10S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			10S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	Mergansers	Wintering			10S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-
704	Raptor	Bald eagle	Concentration Area			Moderate-High													-	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest													Dec-Jun	-	-	-
813	Waterfowl	American wigeon	Wintering			10S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			10S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering			10S													-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering			10S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			10S													-	-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	Mergansers	Wintering			10S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-
942	Waterfowl	Canada goose	Wintering			10S													-	-	-	-
	Waterfowl	Canvasback	Wintering			100S													-	-	-	-
	Waterfowl	Mergansers	Wintering			Present													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-

FISH

Map ID	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				
1398	Diadromous	Alewife	Nursery Area			-													-	Feb-Apr	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-												Feb-Apr	-	-	Feb-Apr	
	Diadromous	American shad	Nursery Area			-												-	Mar-Jul	Mar-Oct	Feb-Jun	
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												-	Jan-Dec	Jan-Dec	Jan-Dec	
	Diadromous	Blueback herring	Nursery Area			-												-	Apr-Jun	May-Oct	-	
	Diadromous	Blueback herring	Spawning Area			-												Mar-Jun	-	-	Mar-Jun	
	Diadromous	Striped bass	Spawning Area			-												Apr-Jun	-	-	Mar-Jun	
	Estuarine Nursery	White perch	Spawning Area			-												Mar-May	Apr-Jun	-	Mar-May	
	Freshwater	Yellow perch	Spawning Area			-												Feb-Mar	Mar-Apr	-	Feb-Mar	
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												-	Jan-Dec	Jan-Dec	Jan-Dec	
1608	Diadromous	Alewife	Nursery Area			-												-	Feb-Apr	Apr-Oct	Feb-Apr	
1615	Diadromous	American shad	Nursery Area			-												-	Mar-Jul	Mar-Oct	Feb-Jun	
	Diadromous	Blueback herring	Nursery Area			-												-	Apr-Jun	May-Oct	Mar-Jun	
	Estuarine Nursery	White perch	Nursery Area			-												-	Apr-Jun	Jan-Dec	-	

REPTILES & AMPHIBIANS



Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Hatch	Interest	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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1762	Turtle	Diamondback terrapin	Concentration Area			High																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

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
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	Jun-Oct	Jun-Oct
1834	Crab	Blue crab	Concentration Area			Highly Abundant-Wint													-	-	Dec-Mar	Dec-Mar

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			100S													-	-	-	-
		Red-throated loon			10S													-	-	-	-
	Waterfowl	American black duck			10S													-	-	-	-
		Bufflehead			100S													-	-	-	-
		Canada goose			100S													-	-	-	-
		Canvasback			1,000S													-	-	-	-
		Long-tailed duck			Present													-	-	-	-
		Mallard			Present													-	-	-	-
		Mergansers			100S													-	-	-	-
		Redhead			10S													-	-	-	-


BIRDS (continued)

Subelement	Species	MD/VA	Mapping Qualifier	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt	
				S	F	Concentration	J	F	M	A	M	J	J	A	S					O
	Ruddy duck		Wintering			1,000S												-	-	-
	Scaup		Wintering			10S												-	-	-
	Scoters		Wintering			10S												-	-	-

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			-												-	-	-	Feb-Apr		
		American shad	Migration			-												-	-	-	Feb-Jun		
		Atlantic sturgeon	Concentration Area	-/E	E	High												-	-	-	Jan-Dec		
		Atlantic sturgeon	Migration	-/E	E	Spring Run Migration												-	-	-	Apr-May		
		Atlantic sturgeon	Migration	-/E	E	Fall Run Migration												-	-	-	Jun-Nov		
		Blueback herring	Migration			-												-	-	-	Mar-Jun		
		Hickory shad	Migration			-												-	-	-	Jun-Sep		
		Striped bass	Nursery Area			-												-	-	-	Feb-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						
	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	-	-	-
	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	-	May-Dec*	-

INVERTEBRATES

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

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													-	-	-	
	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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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FISH

Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	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													-	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	May-Oct
	Atlantic croaker													-	-	-	Jan-Dec	Jan-Dec
	Atlantic menhaden													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black drum													-	-	-	-	Apr-Nov
	Kingfishes													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	-	May-Nov
	Red drum													-	-	-	-	Apr-Nov
	Sheepshead													-	-	-	-	Apr-Dec
	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
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	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
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Longnose gar													May-Jun	-	-	Jan-Dec	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Marine Benthic													-	-	-	-	Apr-Sep
	Northern searobin													-	-	-	Jan-Dec	Jan-Dec
	Marine Pelagic													-	-	-	Jul-Nov	Mar-Nov
	Butterfish													-	-	-	-	May-Nov
	Harvestfish													-	-	-	-	Jan-Dec
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Hatch	Internest	Juveniles	Adults
	Turtle													May-Aug	-	-	Apr-Oct	Apr-Oct
	Diamondback terrapin													-	-	-	-	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
		Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Cephalopod	Squid												-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
		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

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	655.70	1.02
10B	Freshwater Marshes	96.06	0.15
10C	Swamps	699.00	1.09
10D	Scrub and Shrub Wetlands	59.63	0.09

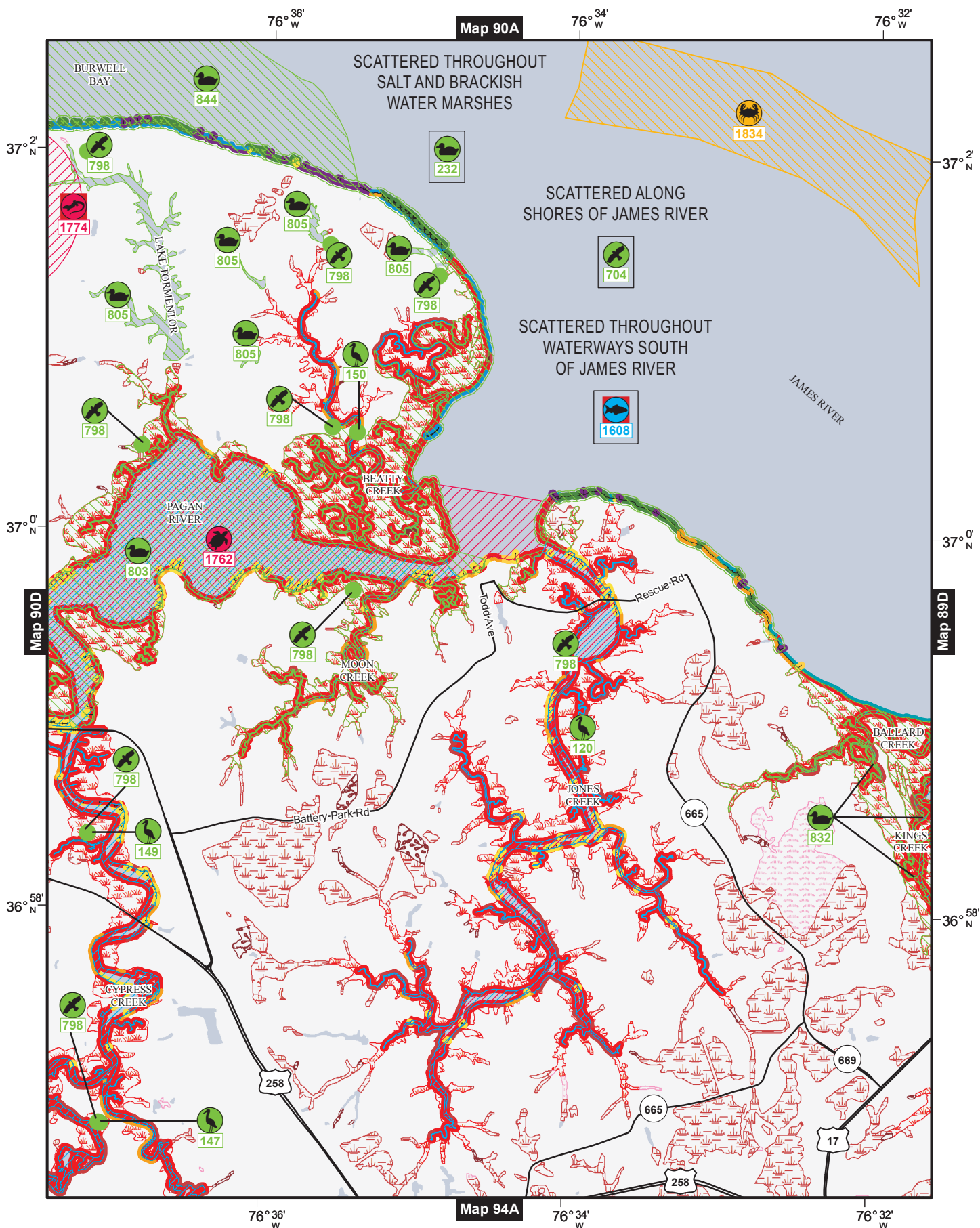
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	53,219.56	33.07	56%
10B	Freshwater Marshes	10,761.07	6.69	11%
10C	Swamps	4,328.39	2.69	5%
9B	Vegetated Low Banks	7,725.76	4.80	8%
8B	Sheltered, Solid Man-Made Structures	3,109.79	1.93	3%
8C	Sheltered Riprap	773.58	0.48	1%
6B	Riprap	1,478.42	0.92	2%
4	Coarse Grained Sand Beaches	10,847.95	6.74	11%
3B	Scarps and Steep Slopes (Sand)	309.42	0.19	< 1%
1B	Exposed, Solid Man-Made Structures	2,461.04	1.53	3%
Total ESI Shoreline:		95,014.98	59.04	
Total Shoreline:		79,180.84	49.20	

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



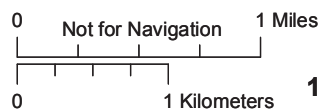


Map 90C

Chesapeake South



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 90C
Chesapeake South

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				
120	Wading	Great blue heron	Nesting				5 Nests													Feb-Jun	-	-	-
147	Wading	Great blue heron	Nesting				17 Nests													Feb-Jun	-	-	-
149	Wading	Great blue heron	Nesting				18 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
704	Raptor	Bald eagle	Concentration Area				Moderate-High													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
803	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Scaup	Wintering				10S													-	-	-	-
805	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				Present													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-
832	Waterfowl	American black duck	Wintering				Present													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				10S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering				Present													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				10S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
844	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Mallard	Wintering				Present													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Redhead	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				10S													-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Monthly Presence												Eggs	Larvae	Juveniles	Adults		
1608	Diadromous	Atlantic sturgeon	General Distribution	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	-	Jan-Dec	Jan-Dec	Jan-Dec
				-/E	E	-																	

REPTILES & AMPHIBIANS



Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence												Nest	Hatch	Interest	Juveniles	Adults
1762	Turtle	Diamondback terrapin	Concentration Area	MD/V/A	-/E	E	High	J	F	M	A	M	J	J	A	S	O	N	D	May-Aug	-	-	Apr-Oct	Apr-Oct
1774	Amphibian	Barking treefrog	Vulnerable Occurrence	MD/V/A	-/E	E	-	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-	Jan-Dec

INVERTEBRATES


Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
1834	Crab	Blue crab	Concentration Area	MD/V/A	-/E	E	Highly Abundant-Wint	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	Dec-Mar	Dec-Mar

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/V/A		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													-	Aug-Nov	-	
	Grebes	Wintering			100S													-	-	-	
	Red-throated loon	Wintering			10S													-	-	-	
	Bufflehead	Wintering			100S													-	-	-	
	Canada goose	Wintering			10S													-	-	-	
	Canvasback	Wintering			100S													-	-	-	
	Long-tailed duck	Wintering			Present													-	-	-	
	Mergansers	Wintering			Present													-	-	-	
	Ruddy duck	Wintering			100S													-	-	-	
	Scoters	Wintering			10S													-	-	-	
																		-	-	-	


FISH

Subelement	Species	Mapping Qualifier	MD/V/A			Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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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					
			T/T	T		T	T														
	Green sea turtle	General Distribution			Common												-	-	-	Jul-Oct	-
	Green sea turtle	General Distribution			Rare												-	-	-	May-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					
	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		Monthly Presence												Mating	Calving	Pupping	Molt	
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
			-/E	E																	
	West Indian manatee	General Distribution			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													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Osprey													-	-	-	-

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-Dec	May-Oct
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	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

Chesapeake South: Map 90C

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
	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
	Northern searobin													-	-	-	-	Apr-Sep
	Spotted hake													-	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Mar-Nov
	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

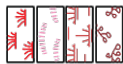
Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Softshell clam													May-Dec*	May-Dec*	May-Jan*	-	Jan-Dec
	Stout razor clam													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	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	2,509.61	3.92
10B	Freshwater Marshes	176.65	0.28
10C	Swamps	1,281.92	2.00
10D	Scrub and Shrub Wetlands	61.30	0.10



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	163,062.23	101.32	79%
10C	Swamps	9,812.57	6.10	5%
10D	Scrub and Shrub Wetlands	302.57	0.19	< 1%
9A	Sheltered Tidal Flats	303.57	0.19	< 1%
9B	Vegetated Low Banks	8,566.53	5.32	4%
8B	Sheltered, Solid Man-Made Structures	6,974.85	4.33	3%
8C	Sheltered Riprap	1,247.07	0.77	1%
6B	Riprap	4,826.70	3.00	2%
5	Mixed Sand and Gravel Beaches	2,484.63	1.54	1%
4	Coarse Grained Sand Beaches	5,334.69	3.31	3%
1B	Exposed, Solid Man-Made Structures	2,201.80	1.37	1%

Total ESI Shoreline: 205,117.22 Total ESI Shoreline: 127.45
 Total Shoreline: 182,618.52 Total Shoreline: 113.47

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 90D
Chesapeake South

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
704	Raptor	Bald eagle	Concentration Area				Moderate-High																
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
802	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Canvasback	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S													-	-	-	-
	Waterfowl	Scaup	Wintering				10S													-	-	-	-
804	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				Present													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				Present													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-
1029	Diving	Common loon	Wintering				10S													-	-	-	-
	Diving	D. crested cormorant	Wintering				1,000S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering				100S													-	-	-	-
	Diving	Red-throated loon	Wintering				10S													-	-	-	-
	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				Present													-	-	-	-
	Waterfowl	Mallard	Wintering				Present													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Redhead	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				10S													-	-	-	-
	Waterfowl	Scoters	Wintering				10S													-	-	-	-

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				
1591	Diadromous	Alewife	Migration			-												-	-	Aug-Nov	Feb-Apr
	Diadromous	American shad	Migration			-												-	-	Aug-Nov	Feb-Jun
	Diadromous	Atlantic sturgeon	Concentration Area	-JE	E	High												-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Atlantic sturgeon	Migration	-JE	E	Spring Run Migration												-	-	-	Apr-May
	Diadromous	Atlantic sturgeon	Migration	-JE	E	Fall Run Migration												-	-	-	Jun-Nov
	Diadromous	Blueback herring	Migration			-												-	-	Aug-Nov	Mar-Jun
	Diadromous	Hickory shad	Migration			-												-	-	Jun-Sep	Feb-May
	Diadromous	Striped bass	Nursery Area			-												-	Mar-May	Jan-Dec	-
1610	Diadromous	Alewife	Migration			-												-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-JE	E	-												-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Blueback herring	Migration			-												-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Nursery Area			-												-	Mar-May	Jan-Dec	-

REPTILES & AMPHIBIANS

Map ID	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				
1762	Turtle	Diamondback terrapin	Concentration Area			High												May-Aug	-	Apr-Oct	Apr-Oct
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	-
1774	Amphibian	Barking treefrog	Vulnerable Occurrence	E/T		-												-	-	-	Jan-Dec

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				
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*
1810	Bivalve	Eastern floater	Vulnerable Occurrence			-												-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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		Monthly Presence												Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N			
	Diving	Brown pelican																-	-	-
	Gull/Tern	D. crested cormorant																-	-	-
		Gulls																-	-	-
		Terns																-	-	-
	Raptor	Osprey																-	-	-

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
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	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	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
	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

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

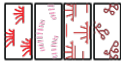
INVERTEBRATES

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
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	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	508.90	0.80
10B	Freshwater Marshes	74.53	0.12
10C	Swamps	2,363.81	3.69
10D	Scrub and Shrub Wetlands	217.88	0.34



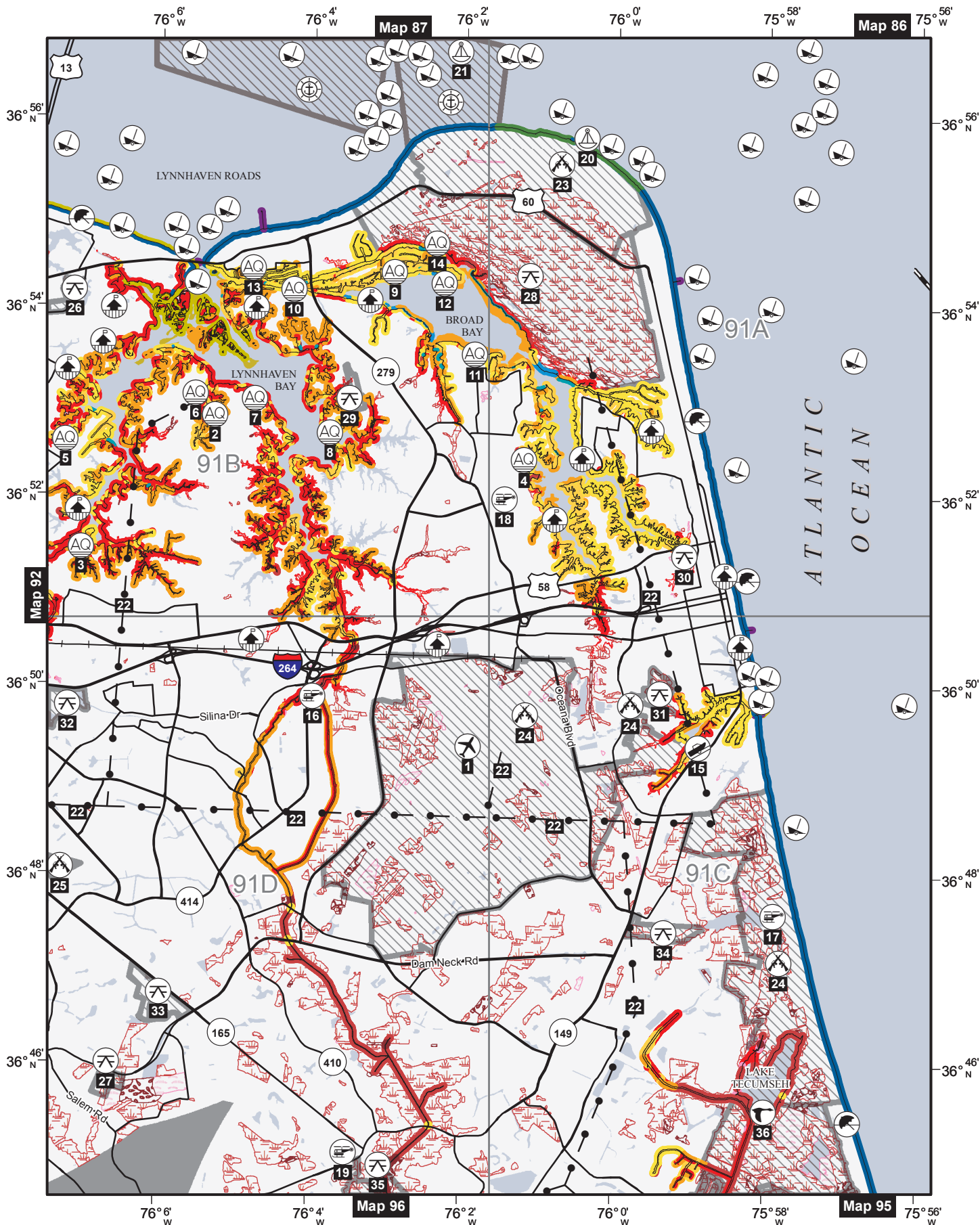
ESI SHORELINE HABITAT TYPES

<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	33,598.08	20.88	71%
10C	Swamps	5,424.84	3.37	11%
10D	Scrub and Shrub Wetlands	57.00	0.04	< 1%
9B	Vegetated Low Banks	1,982.35	1.23	4%
8B	Sheltered, Solid Man-Made Structures	980.90	0.61	2%
8C	Sheltered Riprap	856.51	0.53	2%
6B	Riprap	932.95	0.58	2%
4	Coarse Grained Sand Beaches	3,489.79	2.17	7%
1B	Exposed, Solid Man-Made Structures	12.26	0.01	< 1%
Total ESI Shoreline:		47,334.67	29.41	
Total Shoreline:		39,670.93	24.65	

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 91
Chesapeake South



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 91
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	AIRPORT	OCEANA NAS /APOLLO SOUCEK FIELD/		
2	AQUACULTURE	OYSTER COMMERCIAL WHEELER, BONNIE RF#98-0998	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
3	AQUACULTURE	OYSTER NON-COMM ALLEY RF#98-1665	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
4	AQUACULTURE	OYSTER NON-COMM BELL, ANDREA RF#99-0984	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	AQUACULTURE	OYSTER NON-COMM BUTTS RF#99-0859	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
6	AQUACULTURE	OYSTER NON-COMM CHU, YOUNG KWAN RF#98-1482	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
7	AQUACULTURE	OYSTER NON-COMM DAVID GATLING RF#011158	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
8	AQUACULTURE	OYSTER NON-COMM JESSON RF#99-0346	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
9	AQUACULTURE	OYSTER NON-COMM KORTE RF#98-1717	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
10	AQUACULTURE	OYSTER NON-COMM LARKSPUR MIDDLE SCHOOL RF#99-1839	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
11	AQUACULTURE	OYSTER NON-COMM MCNEIL, LYDIA A. RF#98-2200	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
12	AQUACULTURE	OYSTER NON-COMM MILLER, ELMER E. RF#98-2278	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
13	AQUACULTURE	OYSTER NON-COMM SLEPSKY RF#98-1695	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
14	AQUACULTURE	OYSTER NON-COMM SPECKHART RF#99-1277	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
15	BOAT RAMP	OWLS CREEK MUNICIPAL	LENE PENNINGTON, VDGIF	804-367-0058
16	HELIPORT	BREEDEN COMPANY		
17	HELIPORT	LZ ALFA		
18	HELIPORT	VIRGINIA BEACH GENERAL HOSPITAL		
19	HELIPORT	VIRGINIA BEACH MUNI		
20	REPEATED MEASUREMENT SITE	DB - NOS, 8638999 - CAPE HENRY, VA	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
21	REPEATED MEASUREMENT SITE	WQ - STATION CB8.1E	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (LINES)				
Map ID	Type	Name	Contact	Phone
22	PIPELINE	PIPELINE		

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
23	MILITARY	FT STORY		
24	MILITARY	NAVAL AIR STATION OCEANA		
25	MILITARY	NAVAL AIR STATION OCEANA (MIDWAY MANOR)		
26	PARK	BAYVILLE PARK	CITY OF VIRGINIA BEACH	
27	PARK	ELBOW PARK	CITY OF VIRGINIA BEACH	
28	PARK	FIRST LANDING STATE PARK	VA DEPT OF CONSERVATION AND RECREATION	
29	PARK	GREAT NECK PARK	CITY OF VIRGINIA BEACH	
30	PARK	KILBOURNE PARK	CITY OF VIRGINIA BEACH	
31	PARK	MARSHVIEW PARK	CITY OF VIRGINIA BEACH	
32	PARK	MOUNT TRASHMORE PARK	CITY OF VIRGINIA BEACH	
33	PARK	PRINCESS ANNE PARK	CITY OF VIRGINIA BEACH	
34	PARK	REDWING PARK	CITY OF VIRGINIA BEACH	
35	PARK	WEST NECK CREEK PARK	CITY OF VIRGINIA BEACH	
36	WILDLIFE REFUGE	BACK BAY NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE	757-301-7329
ALSO PRESENT IN MAPPED AREA (POINTS)				
Type	Name		Contact	Phone
COAST GUARD	MARITIME INTELLIGENCE FUSION CENTER			
ALSO PRESENT IN MAPPED AREA (POLYGONS)				
Type	Name		Contact	Phone
STATE PROTECTED AREA	BLUE CRAB SANCTUARY		VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200







JURISDICTIONS

COUNTY: VIRGINIA BEACH CITY
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, NORFOLK DISTRICT

















FEMA: REGION I
EPA: REGION 3

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	1,068.98	1.67
	10B	Freshwater Marshes	491.94	0.77
	10C	Swamps	8,350.21	13.05
	10D	Scrub and Shrub Wetlands	495.51	0.77
	9A	Sheltered Tidal Flats	209.17	0.33
	7	Exposed Tidal Flats	136.24	0.21

ESI SHORELINE HABITAT TYPES

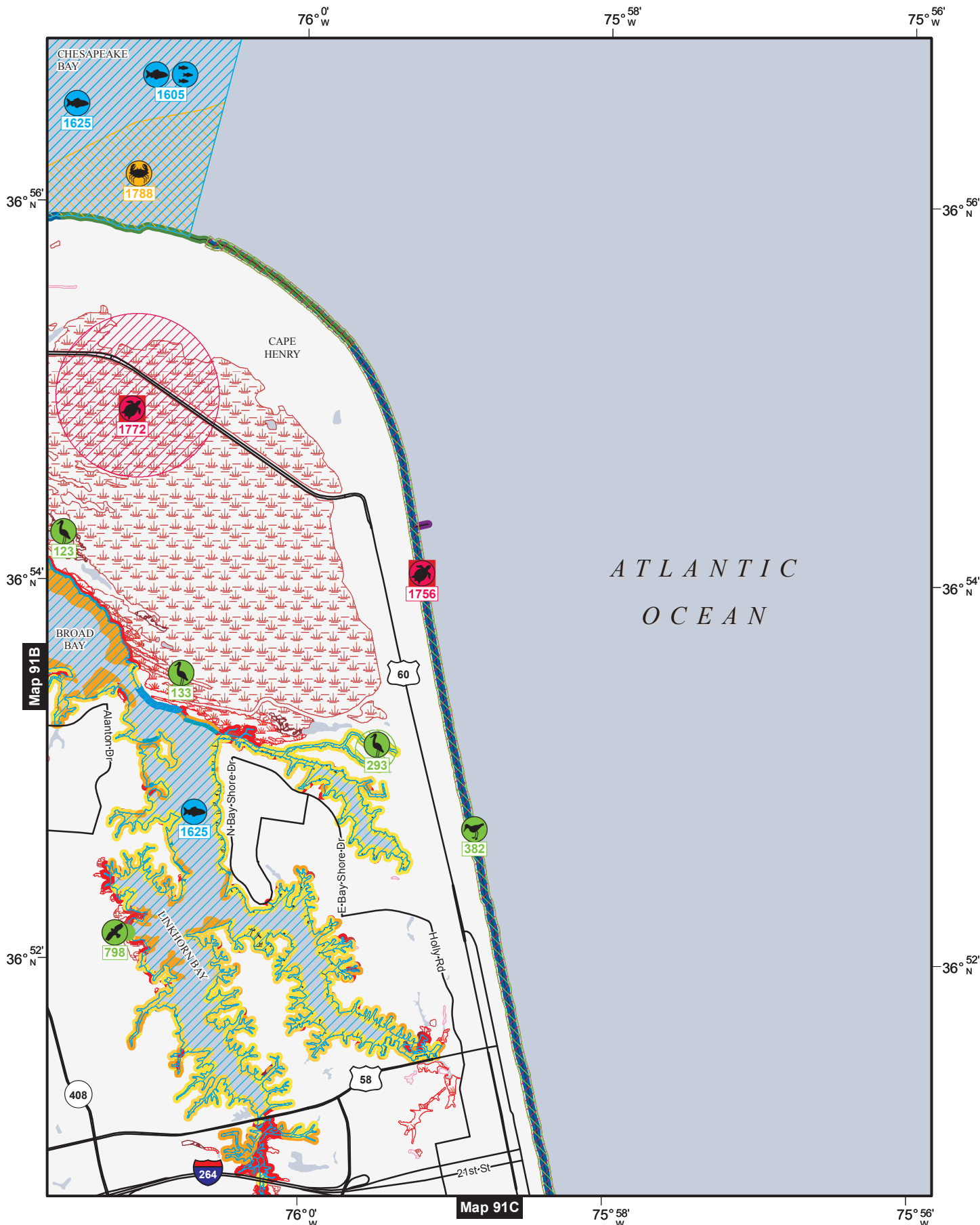
	<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
	10A	Salt and Brackish Water Marshes	221,808.62	137.83	35%
	10B	Freshwater Marshes	1,081.93	0.67	< 1%
	10C	Swamps	31,254.97	19.42	5%
	10D	Scrub and Shrub Wetlands	4,465.36	2.77	1%
	9A	Sheltered Tidal Flats	23,887.98	14.84	4%
	9B	Vegetated Low Banks	100,340.68	62.35	16%
	8B	Sheltered, Solid Man-Made Structures	116,264.53	72.24	18%
	8C	Sheltered Riprap	58,310.97	36.23	9%
	7	Exposed Tidal Flats	33,172.73	20.61	5%
	6B	Riprap	2,884.44	1.79	< 1%
	5	Mixed Sand and Gravel Beaches	5,472.57	3.40	1%
	4	Coarse Grained Sand Beaches	2,415.54	1.50	< 1%
	3A	Fine to Medium Grained Sand Beaches	29,236.80	18.17	5%
	3B	Scarp and Steep Slopes (Sand)	3,237.63	2.01	1%
	1B	Exposed, Solid Man-Made Structures	1,034.49	0.64	< 1%

Total ESI Shoreline: 634,869.23 Total ESI Shoreline: 394.49
 Total Shoreline: 507,461.22 Total Shoreline: 315.32

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 91A
Chesapeake South

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/V/A		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
123	Wading	Great blue heron	Nesting			14 Nests													Feb-Jun	-	-	-
133	Wading	Great blue heron	Nesting			52 Nests													Feb-Jun	-	-	-
	Wading	Great egret	Nesting			3 Nests													Apr-Aug	-	-	-
293	Wading	YC night-heron	Nesting			3 Pairs													Apr-Jul	-	-	-
382	Shorebird	Sanderling	Migration			100S													-	May-Jun	Aug-Oct	-
798	Raptor	Bald eagle	Nesting			1 Nest													Dec-Jun	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1605	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	Estuarine Nursery	Atl. sharpnose shark	Nursery Area			-													-	-	-	Jun-Sep	Jun-Sep
	Marine Pelagic	Sandbar shark	Nursery Area			-													-	-	-	May-Sep	May-Sep
1625	Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Migration			-													-	-	-	-	Feb-Jun

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1756	Turtle	Green sea turtle	Vulnerable Occurrence	T/T	T	False Crawl													Jun-Aug	-	-	-	Jun-Aug
	Turtle	K. ridley sea turtle	Vulnerable Occurrence	E/E	E	False Crawl													Jun-Aug	-	-	Jul-Sep	Jun-Aug
	Turtle	Loggerhead sea turtle	Nesting	T/T	T	0-2 Nests													May-Aug	Jun-Oct	-	Jun-Oct	May-Aug
1772	Turtle	Chicken turtle	Vulnerable Occurrence	-/E	-	-													-	-	-	-	Jan-Dec


INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A		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


BIRDS

Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
					J	F	M	A	M	J	J	A	S	O	N	D					
	Alcid	Wintering		10S													-	-	-	-	-
	Diving	Wintering		1,000S													-	-	-	-	-
		Wintering		1,000S													-	Mar-May	Aug-Nov	-	-
		Wintering		100S													-	-	-	-	-
		Wintering		1,000S													-	-	-	-	-
	Pelagic	Wintering		1,000S													-	-	-	-	-
	Waterfowl	Wintering		10S													-	-	-	-	-
		Wintering		100S													-	-	-	-	-
		Wintering		10,000S													-	-	-	-	-
		Wintering															-	-	-	-	-

FISH

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					
	Diadromous	Migration		-													-	-	-	Jan-May	Sep-Dec
	Atlantic sturgeon	General Distribution	-/E E	-													-	-	-	-	Jan-Dec



REPTILES & AMPHIBIANS

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					
	Turtle	General Distribution	T/T T	Rare													-	-	-	May-Dec*	-
	Green sea turtle	General Distribution	T/T T	Common													-	-	-	Jul-Oct	-
	Green sea turtle	General Distribution	E/E E	Common													-	-	-	Apr-Oct*	Apr-Oct*
	K. ridley sea turtle	General Distribution	E/E E	Rare													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E E	Common													-	-	-	Apr-Oct	-
	K. ridley sea turtle	General Distribution	E/E E	Abundant													-	-	-	May-Jun	May-Jun
	K. ridley sea turtle	General Distribution	E/E E	Uncommon													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	Leatherback sea turtle	General Distribution	E/E E	Common													-	-	-	May-Jun	May-Jun
	Leatherback sea turtle	General Distribution	T/T T	Rare													-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T T	Abundant													-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution	T/T T	Common													-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T T	Very Abundant													-	-	-	May-Jun	May-Jun
	Loggerhead sea turtle	General Distribution	T/T T	Abundant													-	-	-	Apr-Oct*	Apr-Oct*

INVERTEBRATES

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					
	Crab	Spawning Area		Spawning													May-Sep	May-Oct	May-Nov	-	May-Sep

MARINE MAMMALS





Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
 Manatee	West Indian manatee	General Distribution	-/E	E												
	Fin whale	General Distribution	E/E	E												
 Whale	Humpback whale	General Distribution	E/E	E												
	Humpback whale	General Distribution	E/E	E												
	N.A. right whale	General Distribution	E/E	E												

TERRESTRIAL MAMMALS



Subelement	Species	Mapping Qualifier	MD/VFA S F	Concentration	Monthly Presence											
					J	F	M	A	M	J	J	A	S	O	N	D
 Bat	Rafinesque's eastern big-eared	Vulnerable Occurrence	-/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													-	-	-	-
 Pelagic	Shearwaters													-	-	-	-
	Storm-petrels													-	-	-	-
 Shorebird	Phalaropes													-	-	-	-

FISH


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

Chesapeake South: Map 91A






FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Black drum													-	-	-	-	Apr-Oct
	Black sea bass													Jun-Oct	-	-	Apr-Oct	Apr-Oct
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Bluefish													-	-	-	May-Nov	Apr-Nov
	Kingfishes													-	-	-	-	Apr-Nov
	Kingfishes													Apr-Sep	-	-	-	Apr-Oct
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Northern puffer													-	-	-	-	Jan-Dec
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spot													-	-	-	Nov-Apr	Apr-Nov
	Spotted seatrout													May-Jul	-	-	Oct-May	Apr-Oct
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Summer flounder													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	Weakfish													-	-	-	-	Dec-Mar
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Winter flounder													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	-	Jan-Dec
	Silversides													Apr-Sep	-	-	-	Jan-Dec
	Anchovies													-	-	-	-	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Great hammerhead													-	-	-	-	May-Oct
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Clearnose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Jan-Dec
	Northern searobin													-	-	-	-	Apr-Dec
	Red hake													-	-	-	-	Mar-Oct
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	Feb-May	Sep-Nov
	Smooth butterfly ray													-	-	-	-	Oct-May
	Smooth dogfish													May-Sep	-	-	May-Oct	May-Oct
	Southern stingray													-	-	-	-	Apr-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					
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Atlantic mackerel													-	-	-	-	Jan-Dec
	Blacktip shark													-	-	-	-	Mar-Apr
	Butterfish													-	-	-	-	May-Oct
	Cobia													-	-	-	Jul-Nov	Mar-Nov
	Dusky shark													-	-	-	-	Jun-Sep
	Great white shark													-	-	-	-	May-Oct
	Harvestfish													-	-	-	-	Jan-Dec
	Lined seahorse													May-Oct	-	-	-	May-Nov
	Sand tiger shark													-	-	-	-	Jan-Dec
	Sandbar shark													-	-	-	-	May-Oct
	Scalloped hammerhead													-	-	-	May-Oct	May-Oct
	Spanish mackerel													-	-	-	-	May-Sep
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	Nov-May	Nov-May
	Thresher shark													-	-	-	-	May-Sep
														-	-	-	-	

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Atlantic surfclam													-	-	-	-	Jan-Dec
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Squid													-	-	-	-	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	May-Nov	Jan-Dec	Jan-Dec
	Hermit crab													-	-	-	-	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Lady crab													-	-	-	-	Jan-Dec
	Spider crabs													-	-	-	Jan-Dec	Jan-Dec
	Channeled whelk													-	-	-	Jan-Dec	Jan-Dec
	Knobbed whelk													-	-	-	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												Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D	May-Aug	May-Aug	
	Bottlenose dolphin															-
	Harbor porpoise															-
	Short-beaked common dolphin															-
	Gray seal															-
	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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	189.22	0.30
10B	Freshwater Marshes	5.89	0.01
10C	Swamps	2,025.57	3.16
10D	Scrub and Shrub Wetlands	19.62	0.03
9A	Sheltered Tidal Flats	99.94	0.16

ESI SHORELINE HABITAT TYPES

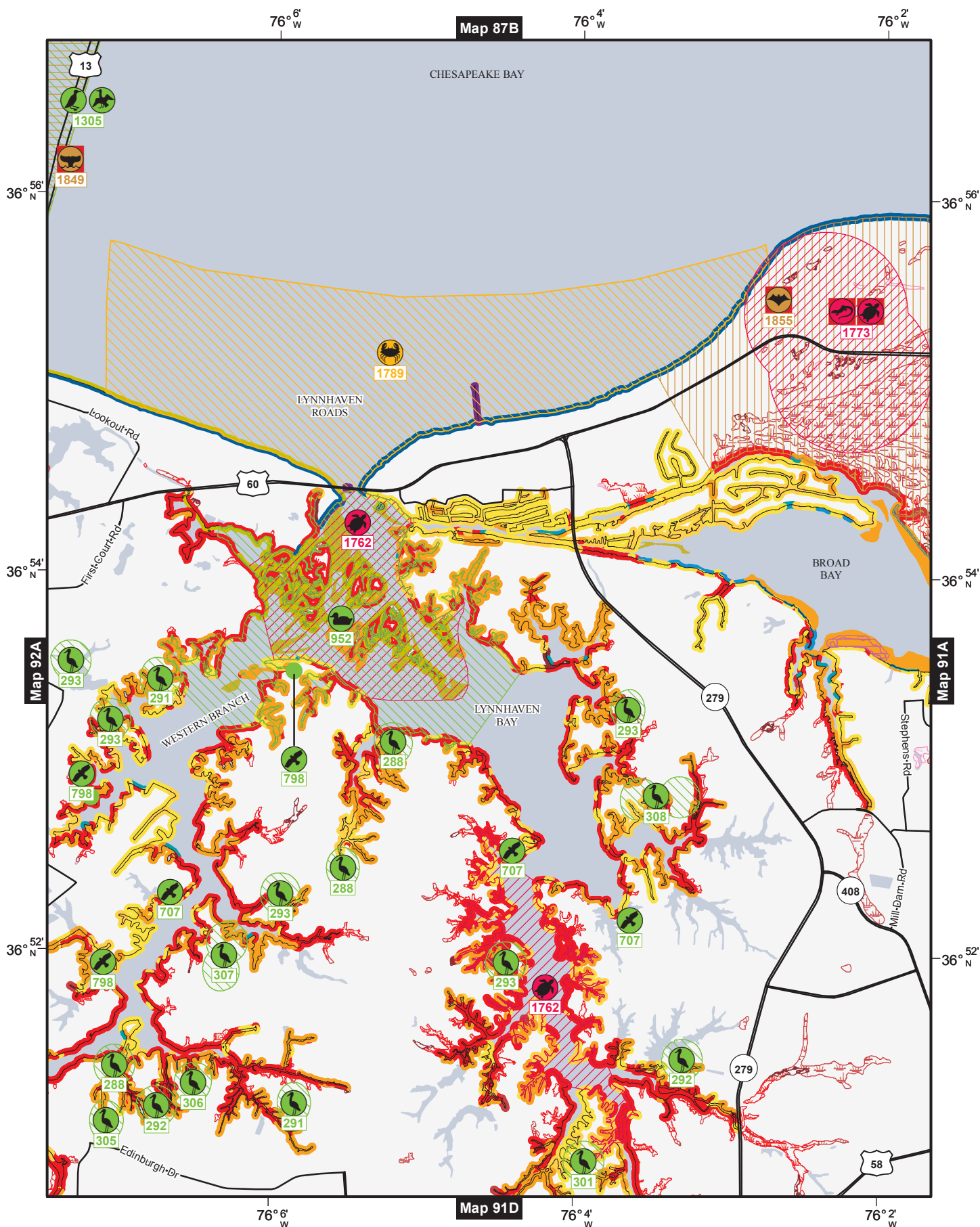
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	15,647.88	9.72	14%
10C	Swamps	830.86	0.52	1%
10D	Scrub and Shrub Wetlands	840.86	0.52	1%
9A	Sheltered Tidal Flats	5,772.00	3.59	5%
9B	Vegetated Low Banks	6,475.33	4.02	6%
8B	Sheltered, Solid Man-Made Structures	38,829.99	24.13	35%
8C	Sheltered Riprap	26,835.58	16.67	24%
6B	Riprap	2,344.58	1.46	2%
5	Mixed Sand and Gravel Beaches	2,681.23	1.67	2%
4	Coarse Grained Sand Beaches	559.41	0.35	1%
3A	Fine to Medium Grained Sand Beaches	9,772.66	6.07	9%
3B	Scarps and Steep Slopes (Sand)	39.15	0.02	< 1%
1B	Exposed, Solid Man-Made Structures	304.17	0.19	< 1%

Total ESI Shoreline: 110,933.69 Total ESI Shoreline: 68.93
Total Shoreline: 100,272.97 Total Shoreline: 62.31

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 91B Chesapeake South



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 91B
Chesapeake South

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	N	D				
288	Wading	YC night-heron	Nesting				2 Pairs													Apr-Jul	-	-	-
291	Wading	YC night-heron	Nesting				4 Pairs													Apr-Jul	-	-	-
292	Wading	YC night-heron	Nesting				5 Pairs													Apr-Jul	-	-	-
293	Wading	YC night-heron	Nesting				3 Pairs													Apr-Jul	-	-	-
301	Wading	YC night-heron	Nesting				9 Pairs													Apr-Jul	-	-	-
305	Wading	YC night-heron	Nesting				17 Pairs													Apr-Jul	-	-	-
306	Wading	YC night-heron	Nesting				8 Pairs													Apr-Jul	-	-	-
307	Wading	YC night-heron	Nesting				11 Pairs													Apr-Jul	-	-	-
308	Wading	YC night-heron	Nesting				12 Pairs													Apr-Jul	-	-	-
707	Raptor	Bald eagle	Roosting				-													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
952	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	Brant	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				10S													-	-	-	-
1305	Diving	Common loon	Wintering				100S													-	-	-	-
	Diving	D. crested cormorant	Wintering				100S													-	Mar-May	Aug-Nov	-
	Diving	Red-throated loon	Wintering				100S													-	-	-	-
	Pelagic	Northern gannet	Wintering				100S													-	-	-	-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
								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
1773	Amphibian	Barking treefrog	Vulnerable Occurrence				E/T													-	-	-	-	Jan-Dec
	Turtle	Chicken turtle	Vulnerable Occurrence				-/E													-	-	-	-	Jan-Dec

INVERTEBRATES

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					
1789	Crab	Blue crab	Concentration Area				Highly Abundant													-	-	-	Jun-Mar*	Jun-Mar*

MARINE MAMMALS

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

TERRESTRIAL MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
1855	Bat	Rafinesque's eastern big-eared	Vulnerable Occurrence		-/E		-	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-

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
Acid	Alcids	Wintering				10S	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-
Diving	Common loon	Wintering				1,000S	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-
	D. crested cormorant	Wintering				1,000S	J	F	M	A	M	J	J	A	S	O	N	D	-	Mar-May	Aug-Nov	-
	Grebes	Wintering				100S	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-
	Red-throated loon	Wintering				1,000S	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-
Pelagic	Northern gannet	Wintering				1,000S	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-
Waterfowl	Long-tailed duck	Wintering				10S	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-
	Red-breasted merganser	Wintering				100S	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-
	Scooters	Wintering				10,000S	J	F	M	A	M	J	J	A	S	O	N	D	-	-	-	-


FISH

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



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																
						T/T	T	T	T	T	T	T	T	T	T	T						T
	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	Common										-	-	-	Apr-Oct*	Apr-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	-		
	K. ridley sea turtle	General Distribution		E/E	E	Abundant										-	-	-	May-Jun	May-Jun		
	K. ridley sea turtle	General Distribution		E/E	E	Rare										-	-	-	Nov-Dec	-		
	Leatherback sea turtle	General Distribution		E/E	E	Common										-	-	-	May-Jun	May-Jun		
	Leatherback sea turtle	General Distribution		E/E	E	Rare										-	-	-	Mar-Dec*	Mar-Dec*		
	Loggerhead sea turtle	General Distribution		T/T	T	Abundant										-	-	-	Apr-Oct*	Apr-Oct*		
	Loggerhead sea turtle	General Distribution		T/T	T	Rare										-	-	-	Nov-Dec	Nov-Dec		
	Loggerhead sea turtle	General Distribution		T/T	T	Common										-	-	-	Nov-Dec	Nov-Dec		
	Loggerhead sea turtle	General Distribution		T/T	T	Very Abundant										-	-	-	May-Jun	May-Jun		
	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-Wint																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

MARINE MAMMALS






<div></div>	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				
<div></div>	Manatee	West Indian manatee	General Distribution	-E	E	Rare																
		Fin whale	General Distribution	E/E	E	Common																
	Whale	Humpback whale	General Distribution	E/E	E	Uncommon																
		Humpback whale	General Distribution	E/E	E	Common																

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					■											
	Gulls	■	■	■	■	■	■	■	■	■	■	■	■				
	Terns					■	■	■	■	■	■	■	■				
	Shearwaters					■	■	■	■	■	■	■	■				
	Storm-petrels					■	■	■	■	■	■	■	■				
	Phalaropes	■	■	■	■	■	■	■	■	■	■	■	■				

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 herring													-	-	-	Feb-Jun	Feb-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
	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													-	-	-	-	Jan-Dec
	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
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Jan-Dec
	Cobia													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	Jun-Sep
	Lined seahorse													May-Oct	-	-	-	May-Nov
	Spanish mackerel													-	-	-	-	Jan-Dec
	Spiny dogfish													-	-	-	-	May-Sep
														-	-	-	Nov-May	Nov-May



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
	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													-	-	-	-
	Short-beaked common dolphin													-	-	-	-
	Gray seal													-	-	-	-
	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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	644.88	1.01
10B	Freshwater Marshes	8.39	0.01
10C	Swamps	398.04	0.62
10D	Scrub and Shrub Wetlands	37.10	0.06
9A	Sheltered Tidal Flats	109.23	0.17
7	Exposed Tidal Flats	136.24	0.21

ESI SHORELINE HABITAT TYPES

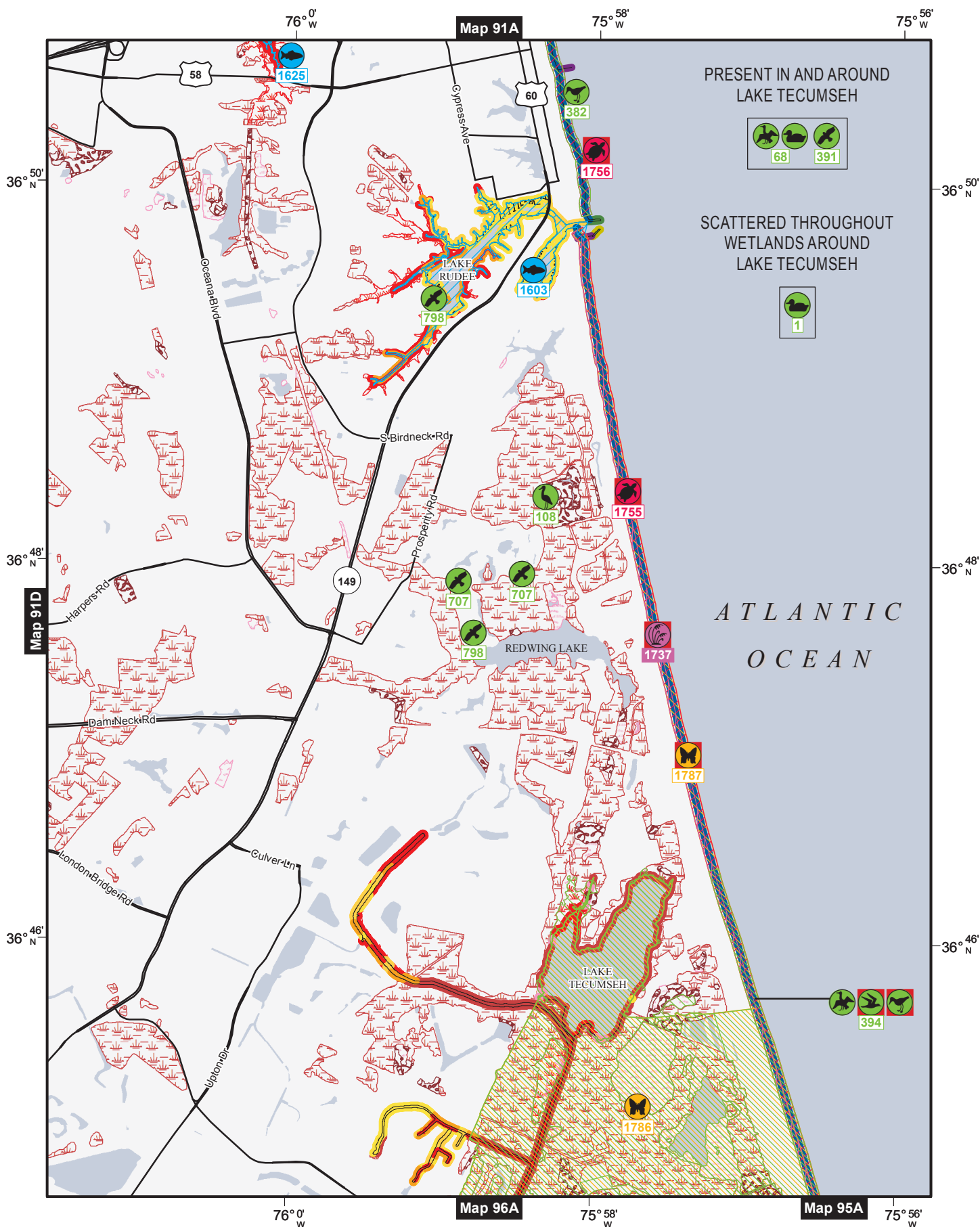
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	169,280.82	105.19	43%
10C	Swamps	817.02	0.51	< 1%
10D	Scrub and Shrub Wetlands	1,224.99	0.76	< 1%
9A	Sheltered Tidal Flats	9,228.84	5.73	2%
9B	Vegetated Low Banks	72,776.61	45.22	19%
8B	Sheltered, Solid Man-Made Structures	63,271.96	39.32	16%
8C	Sheltered Riprap	26,000.72	16.16	7%
7	Exposed Tidal Flats	32,949.54	20.47	8%
5	Mixed Sand and Gravel Beaches	2,791.34	1.73	1%
4	Coarse Grained Sand Beaches	1,856.13	1.15	< 1%
3A	Fine to Medium Grained Sand Beaches	7,836.45	4.87	2%
3B	Scarps and Steep Slopes (Sand)	3,198.47	1.99	1%
1B	Exposed, Solid Man-Made Structures	454.05	0.28	< 1%

Total ESI Shoreline: 391,686.94 Total ESI Shoreline: 243.38
 Total Shoreline: 301,514.22 Total Shoreline: 187.35

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 91C
Chesapeake South

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				
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
68	Diving	Common loon	Wintering				10S													-	-	-	-
	Diving	Grebes	Wintering				Present													-	-	-	-
	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American coot	Wintering				1,000S													-	-	-	-
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Canvasback	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				Present													-	-	-	-
	Waterfowl	Northern pintail	Wintering				100S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				Present													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				10S													-	-	-	-
	Waterfowl	Scaup	Wintering				100S													-	-	-	-
	Waterfowl	Snow goose	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
108	Wading	Great blue heron	Nesting				6 Nests													Feb-Jun	-	-	-
382	Shorebird	Sanderling	Migration				100S													-	May-Jun	Aug-Oct	-
391	Raptor	Northern harrier	Wintering				High													-	-	-	-
394	Diving	Brown pelican	Concentration Area				High													-	-	-	-
	Diving	D. crested cormorant	Migration				Very High													-	Mar-May	Aug-Nov	-
	Gull/Tern	Gull-billed tern	General Distribution				Low													-	Apr-Jun	Jul-Sep	-
	Gull/Tern	Gulls	Concentration Area				High													-	-	-	-
	Gull/Tern	Terns	Concentration Area				High													-	-	-	-
	Shorebird	Black-bellied plover	Migration				Moderate													-	May-Jun	Sep-Dec	-
	Shorebird	Dunlin	Migration				High													-	Apr-May	Oct-Nov	-
	Shorebird	Greater yellowlegs	Migration				Moderate													-	Mar-Apr	Jul-Nov	-
	Shorebird	Least sandpiper	Migration				High													-	Mar-Apr	Jul-Nov	-
	Shorebird	Piping plover	General Distribution				Low													-	Mar-Jun	Jul-Oct	-
	Shorebird	Red knot	Migration				Moderate													-	Apr-Jun	Jul-Oct	-

Chesapeake South: Map 91C

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				
	Shorebird	Ruddy turnstone	Migration			Moderate												-	May	Aug	-
	Shorebird	Sanderling	Migration			Very High												-	May-Jun	Aug-Oct	-
	Shorebird	Semipalmated plover	Migration			High												-	Apr-Jun	Jul-Nov	-
	Shorebird	Semipalmated sandpiper	Migration			High												-	Apr-Jun	Jul-Oct	-
	Shorebird	Whimbrel	Migration			Moderate												-	Apr-May	Jul-Sep	-
	Shorebird	Willet	Migration			High												-	May	Jul	-
707	Raptor	Bald eagle	Roosting			-												-	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest												-	-	-	-

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					
1603	Marine Pelagic	Sandbar shark	Nursery Area			-												-	-	-	May-Sep	May-Sep
1625	Diadromous	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Migration			-												-	-	-	-	Feb-Jun

HABITATS & RARE PLANTS

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					
1737	Wetland	Seabeach amaranth	Vulnerable Occurrence			Very Rare												-	-	-	-	-


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					
1755	Turtle	Green sea turtle	Vulnerable Occurrence			1 Nest												Jun-Aug	-	-	-	Jun-Aug
	Turtle	K. ridley sea turtle	Nesting			0-1 Nest												Jun-Aug	-	-	Jul-Sep	Jun-Aug
	Turtle	Loggerhead sea turtle	Nesting			0-8 Nests												May-Aug	Jun-Oct	-	Jun-Oct	May-Aug
1756	Turtle	Green sea turtle	Vulnerable Occurrence			False Crawl												Jun-Aug	-	-	-	Jun-Aug
	Turtle	K. ridley sea turtle	Vulnerable Occurrence			False Crawl												Jun-Aug	-	-	Jul-Sep	Jun-Aug
	Turtle	Loggerhead sea turtle	Nesting			0-2 Nests												May-Aug	Jun-Oct	-	Jun-Oct	May-Aug


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					
1786	Insect	Monarch butterfly	Migration			-												-	-	-	-	Sep-Oct
1787	Insect	NE beach tiger beetle	Vulnerable Occurrence			Potential												Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
							J	F	M	A	M	J	J	A	S	O	N	D					
 Diving	Alcid	Wintering				10S													-	-	-	-	-
	Common loon	Wintering				1,000S													-	-	-	-	-
	D. crested cormorant	Wintering				1,000S													-	Mar-May	Aug-Nov	-	-
	Grebes	Wintering				100S													-	-	-	-	-
	Red-throated loon	Wintering				1,000S													-	-	-	-	-
 Pelagic	Northern gannet	Wintering				1,000S													-	-	-	-	-
	Long-tailed duck	Wintering				10S													-	-	-	-	-
	Red-breasted merganser	Wintering				100S													-	-	-	-	-
	Waterfowl	Wintering				10,000S													-	-	-	-	-
	Scoters	Wintering																	-	-	-	-	-

FISH

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					
 Diadromous	American eel	Migration				-													-	-	-	-	Sep-Dec
	Atlantic sturgeon	General Distribution				-/E E													-	-	-	-	Jan-May


REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
							J	F	M	A	M	J	J	A	S	O	N	D					
 Turtle	Green sea turtle	General Distribution				T/T T													-	-	-	Jul-Oct	-
	Green sea turtle	General Distribution				T/T T													-	-	-	May-Dec*	-
	K. ridley sea turtle	General Distribution				E/E E													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution				E/E E													-	-	-	Apr-Oct	-
	Leatherback sea turtle	General Distribution				E/E E													-	-	-	Mar-Dec*	Mar-Dec*
	Leatherback sea turtle	General Distribution				E/E E													-	-	-	May-Jun	May-Jun
	Loggerhead sea turtle	General Distribution				T/T T													-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution				T/T T													-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution																	-	-	-	-	-
	Loggerhead sea turtle	General Distribution																	-	-	-	-	-






INVERTEBRATES

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					
 Crab	Blue crab	Spawning Area				Spawning													May-Sep	May-Oct	May-Nov	-	May-Sep



MARINE MAMMALS

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				
 Manatee	West Indian manatee	General Distribution				Rare													-	-	-	-
	Fin whale	General Distribution				E/E E													-	-	-	-
	Humpback whale	General Distribution				E/E E													-	-	-	-
	Humpback whale	General Distribution				E/E E													-	-	-	-
	N.A. right whale	General Distribution				E/E E													-	-	-	-

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													-	Mar-May	Aug-Nov	-
	D. crested cormorant													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Shearwaters													-	-	-	-
	Storm-petrels													-	-	-	-
	Bald eagle													Dec-Jun	-	-	-
	Bald eagle													-	-	-	-
	Osprey													-	-	-	-
	Osprey													Mar-Aug	-	-	-
	Phalaropes													-	-	-	-
	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													-	-	-	Apr-May	Mar-Jun
	Alewife													-	-	-	Aug-Nov	Feb-Jun
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	Alewife													-	-	-	Apr-Jun	Apr-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	Aug-Nov	Feb-Jul
	American shad													-	-	-	-	Apr-Jun
	American shad													-	-	-	Aug-Nov	Apr-Jun
	Blueback herring													-	-	-	Aug-Nov	Feb-Jul
	Blueback herring													-	-	-	Apr-Oct	Apr-Jun
	Blueback herring													-	-	Apr-Jun	Apr-Oct	Apr-Jun
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													-	-	-	Feb-Sep	Feb-Sep
	Hickory shad													-	-	-	Jun-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	-	Jan-Dec
	Striped bass													-	-	-	May-Oct	Jan-Dec
	Atl. sharpnose shark													-	-	-	-	May-Oct
	Atlantic croaker													-	-	-	Aug-Dec	May-Nov
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic herring													-	-	-	Feb-Jun	Feb-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	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					
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Atlantic menhaden													-	-	-	May-Oct	May-Oct
	Black drum													-	-	-	-	Apr-Oct
	Black drum													-	-	-	May-Oct	Jan-Dec
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Black sea bass													Jun-Oct	-	-	Apr-Oct	Apr-Oct
	Black sea bass													-	-	-	Apr-Dec	Apr-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Bluefish													-	-	-	May-Nov	Apr-Nov
	Kingfishes													Apr-Sep	-	-	-	Apr-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Mullet													Jul-Oct	-	-	Jan-Dec	Jan-Dec
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	-	Jan-Dec
	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	-	May-Nov
	Red drum													-	-	-	Jan-Dec	Jan-Dec
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Sheepshead													-	-	-	-	Apr-Nov
	Southern flounder													-	-	-	Jan-Dec	-
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spot													-	-	-	Jan-Dec	-
	Spot													-	-	-	Jul-Sep	Jul-Sep
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Jan-Dec	-
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Winter flounder													-	-	-	-	Dec-Mar
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Killifish													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	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					
	Silversides													-	-	-	-	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Great hammerhead													-	-	-	-	May-Oct
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jul	-	-	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Chain pickerel													Feb-Apr	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Eastern creek chubsucker													Mar-May	-	-	Jan-Dec	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Longnose gar													May-Jun	-	-	Jan-Dec	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleamose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Northern searobin													-	-	-	-	Mar-Oct
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	Feb-May	Sep-Nov
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Oct-Jun	-
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Tautog													-	-	-	Jan-Dec	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					
	Marine Pelagic													-	-	-	-	Mar-Apr
	Atlantic mackerel													-	-	-	-	-
	Atlantic needlefish													-	-	-	-	Jan-Dec
	Blacktip shark													-	-	-	-	May-Oct
	Butterfish													-	-	-	-	Jul-Nov
	Butterfish													-	-	-	-	May-Oct
	Cobia													-	-	-	-	Jun-Sep
	Crevalle jack													-	-	-	-	Jun-Oct
	Dusky shark													-	-	-	-	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	-	May-Oct
	Scalloped hammerhead													-	-	-	-	May-Oct
	Scalloped hammerhead													-	-	-	-	May-Sep
	Spanish mackerel													-	-	-	-	May-Oct
	Spinner shark													-	-	-	-	May-Sep
	Spiny dogfish													-	-	-	-	May-Oct
	Thresher shark													-	-	-	-	Nov-May
	Thresher shark													-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Cephalopod													-	-	-	-	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Crab													-	-	-	-	Jan-Dec
	Atlantic rock crab													-	-	-	-	Jan-Dec
	Blue crab													-	-	-	-	Jan-Dec
	Blue crab													-	-	May-Nov	Jan-Dec	Jan-Dec
	Hermit crab													-	-	-	-	Jan-Dec
	Horseshoe crab													Apr-Aug	Apr-Aug	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	-	Jan-Dec
	Lady crab													-	-	-	-	Jan-Dec
	Spider crabs													-	-	-	-	Jan-Dec
	Channeled whelk													-	-	-	-	Jan-Dec
	Knobbed whelk													-	-	-	-	Jan-Dec
	American lobster													-	-	-	-	May-Nov
	Brown shrimp													-	-	-	-	May-Oct
	Brown shrimp													-	-	-	-	May-Oct
	Brown shrimp													-	-	-	-	May-Oct
	Grass shrimp													May-Sep	Jun-Sep	Jan-Dec	Jan-Dec	Jan-Dec
	Mantis shrimp													-	-	-	-	Jan-Dec
	Sand shrimp													May-Sep	Jun-Sep	Jan-Dec	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	-	May-Oct

MARINE MAMMALS


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


TERRESTRIAL MAMMALS

Subelement	Species	Monthly Presence												Calving May-Aug	Pupping May-Aug	Molt
		J	F	M	A	M	J	J	A	S	O	N	D			
 Small Mammal	Northern river otter													-	-	-

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	163.31
10B	Freshwater Marshes	284.41
10C	Swamps	3,088.20
10D	Scrub and Shrub Wetlands	197.42

ESI SHORELINE HABITAT TYPES		
ESI Rank	Shoreline Habitat Classification	% of ESI Shoreline
 10A	Salt and Brackish Water Marshes	26%
10B	Freshwater Marshes	1%
10C	Swamps	17%
10D	Scrub and Shrub Wetlands	< 1%
9A	Sheltered Tidal Flats	12%
9B	Vegetated Low Banks	4%
8B	Sheltered, Solid Man-Made Structures	17%
8C	Sheltered Riprap	6%
7	Exposed Tidal Flats	< 1%
6B	Riprap	1%
3A	Fine to Medium Grained Sand Beaches	15%
1B	Exposed, Solid Man-Made Structures	< 1%

Total ESI Shoreline: 75,893.07 Total ESI Shoreline: 47.16
 Total Shoreline: 58,955.38 Total Shoreline: 36.63

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 91D
Chesapeake South

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	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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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					
1548	Diadromous	Atlantic sturgeon	General Distribution		-/E	E	-																	Jan-Dec
1560	Diadromous	Alewife	Migration				-																	Aug-Nov
	Diadromous	Atlantic sturgeon	General Distribution		-/E	E	-																	Jan-Dec
	Diadromous	Blueback herring	Migration				-																	Mar-Jun
	Diadromous	Striped bass	Migration				-																	Feb-Jun
1625	Diadromous	Alewife	Migration				-																	Feb-Apr
	Diadromous	Blueback herring	Migration				-																	Mar-Jun
	Diadromous	Striped bass	Migration				-																	Feb-Jun

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
1769	Turtle	Green sea turtle	General Distribution		T/T	T	Rare																	
	Turtle	Green sea turtle	General Distribution		T/T	T	Common																	
	Turtle	K. ridley sea turtle	General Distribution		E/E	E	Common																	
	Turtle	K. ridley sea turtle	General Distribution		E/E	E	Uncommon																	
	Turtle	Leatherback sea turtle	General Distribution		E/E	E	Rare																	
	Turtle	Leatherback sea turtle	General Distribution		E/E	E	Common																	Mar-Dec*
	Turtle	Loggerhead sea turtle	General Distribution		T/T	T	Common																	May-Jun
	Turtle	Loggerhead sea turtle	General Distribution		T/T	T	Abundant																	Nov-Dec
	Turtle	Loggerhead sea turtle	General Distribution		T/T	T																		Apr-Oct







INVERTEBRATES

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					
1788	Crab	Blue crab	Concentration Area				Highly Abundant-Summ																	


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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			</

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	Jan-May	Feb-Apr
	American eel													-	-	-	Jan-Dec	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
	Striped bass													-	-	-	-	Jan-Dec
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic herring													-	-	-	Feb-Jun	Feb-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
	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													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													-	-	-	-	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Chain pickerel													Feb-Apr	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Longnose gar													May-Jun	-	-	Jan-Dec	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	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					
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep
	Spiny dogfish													-	-	-	Nov-May	Nov-May

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

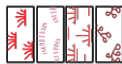
Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

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	71.57	0.11
10B	Freshwater Marshes	193.24	0.30
10C	Swamps	2,838.41	4.44
10D	Scrub and Shrub Wetlands	241.37	0.38



ESI SHORELINE HABITAT TYPES

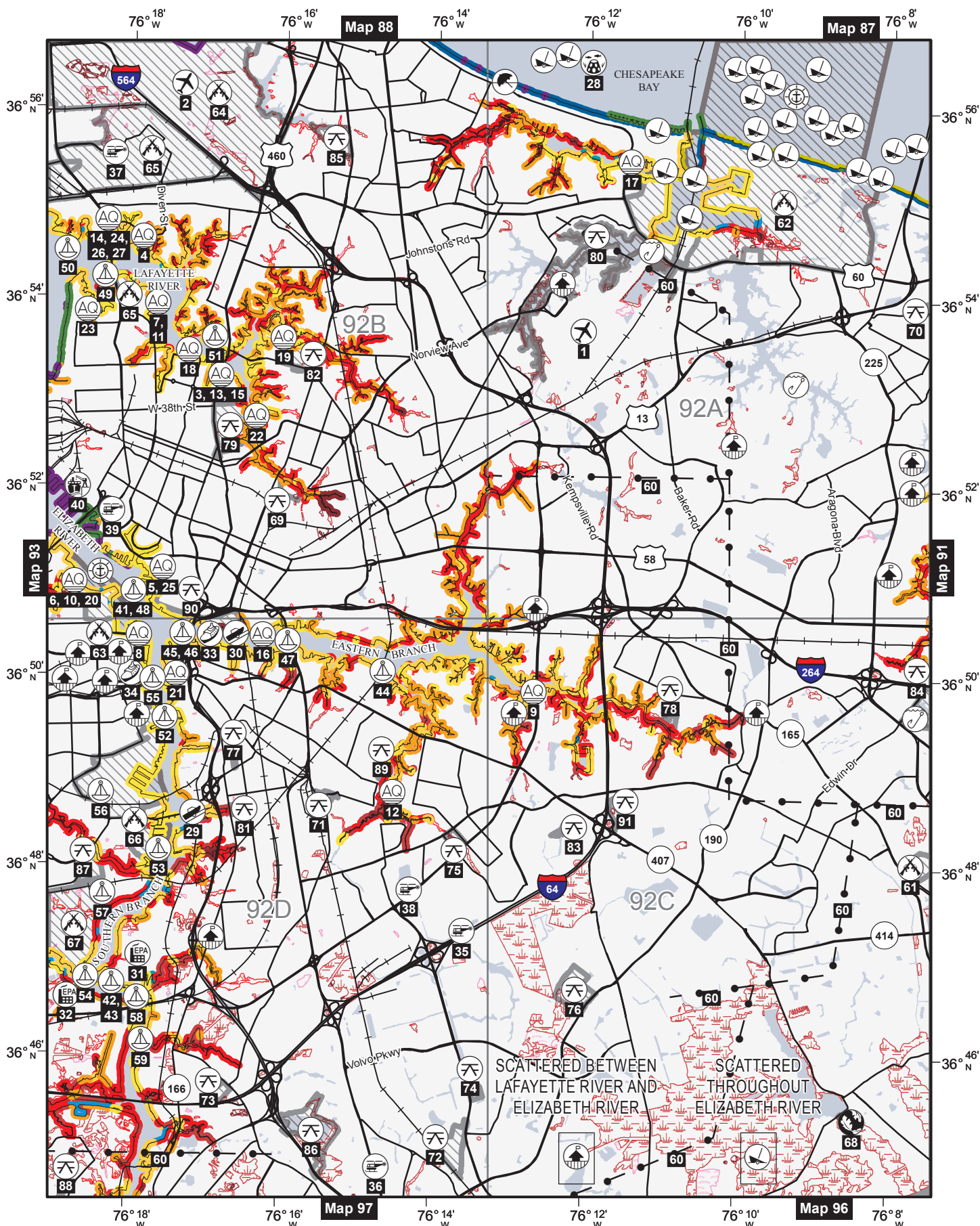
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	17,290.18	10.74	31%
10B	Freshwater Marshes	62.03	0.04	< 1%
10C	Swamps	16,504.20	10.26	29%
10D	Scrub and Shrub Wetlands	2,372.36	1.47	4%
9B	Vegetated Low Banks	17,912.16	11.13	32%
8B	Sheltered, Solid Man-Made Structures	1,465.13	0.91	3%
8C	Sheltered Riprap	749.47	0.47	1%

Total ESI Shoreline: 56,355.53 Total ESI Shoreline: 35.02
Total Shoreline: 46,718.64 Total Shoreline: 29.03

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 92
Chesapeake South



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 92
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)					
Map ID	Type	Name	Contact	Phone	
1	AIRPORT	NORFOLK INTL			
2	AIRPORT	NORFOLK NS (CHAMBERS FLD)			
3	AQUACULTURE	OYSTER NON-COMM BOLLING, JANE RF#98-1824	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
4	AQUACULTURE	OYSTER NON-COMM CHAPMAN, R.C. RF#98-2177	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
5	AQUACULTURE	OYSTER NON-COMM CHES BAY FOUNDATION RF#98-1634	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
6	AQUACULTURE	OYSTER NON-COMM CHES BAY FOUNDATION RF#98-1720	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
7	AQUACULTURE	OYSTER NON-COMM COLE, NANCY A. RF#99-0037	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
8	AQUACULTURE	OYSTER NON-COMM CRAWFORD DAY SCHOOL RF#99-0764	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
9	AQUACULTURE	OYSTER NON-COMM CRISPEN, KIMBERLY RF#98-1753	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
10	AQUACULTURE	OYSTER NON-COMM HARDY RF#98-1791	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
11	AQUACULTURE	OYSTER NON-COMM HOOK, NADINE RF#98-1769	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
12	AQUACULTURE	OYSTER NON-COMM JERRY PACILIO, III RF#2001-2248	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
13	AQUACULTURE	OYSTER NON-COMM KENNEDY, JOHN E. RF#99-0772	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
14	AQUACULTURE	OYSTER NON-COMM LANDMAN RF#01-0838	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
15	AQUACULTURE	OYSTER NON-COMM LINDSAY ABIOUNESS RF#2001-1904	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
16	AQUACULTURE	OYSTER NON-COMM LYON SHIPYARD, INC. RF#98-2212	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
17	AQUACULTURE	OYSTER NON-COMM MASLYN RF#98-1900	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
18	AQUACULTURE	OYSTER NON-COMM MCDONALD, DAVID RF#98-1877	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
19	AQUACULTURE	OYSTER NON-COMM MCELROY RF#01-1287	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
20	AQUACULTURE	OYSTER NON-COMM NAVAL MEDICAL CENTER RF#001700	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
21	AQUACULTURE	OYSTER NON-COMM NORFOLK SHIPBUIL AND D RF#98-1794	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
22	AQUACULTURE	OYSTER NON-COMM NORFOLK ZOO RF#01-2207	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
23	AQUACULTURE	OYSTER NON-COMM OSBORNE RF#01-0775	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
24	AQUACULTURE	OYSTER NON-COMM RAMSEY, HARRY E., JR. RF#99-1382	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
25	AQUACULTURE	OYSTER NON-COMM ROYBAL, DIANE RF#98-1726	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
26	AQUACULTURE	OYSTER NON-COMM STRODE, HILDRETH RF#99-1026	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
27	AQUACULTURE	OYSTER NON-COMM TAYLOR, HARRY B., JR. RF#98-1022	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254	
28	ARTIFICIAL REEF	EAST OCEAN VIEW			
29	BOAT RAMP	ELIZABETH RIVER BOAT RAMP	CITY OF CHESAPEAKE		
30	BOAT RAMP	ELIZABETH RIVER PARK	VIRGINIA DEPT. OF GAME AND INLAND FISHERIES	804-367-1000	
31	EPA FACILITY	CHESAPEAKE TERMINAL	TERMINAL SUPERINTENDENT	757-494-0470	
32	EPA FACILITY	GAS SUPPLY RESOURCES, CHESAPEAKE TERMINAL	SUPV. OPS 1	757-485-1018	
33	FERRY	NORFOLK FERRY			
34	FERRY	PORTSMOUTH FERRY			
35	HELIPORT	ARMADA/HOFFLER BUSINESS CENTER			
36	HELIPORT	CHESAPEAKE GENERAL HOSPITAL			
37	HELIPORT	COMLANFTLT			
38	HELIPORT	DIVISION FIVE			
39	HELIPORT	SENTARA NORFOLK GENERAL HOSPITAL			
40	PORT	PORT OF NORFOLK HARBOR			

DISPLAYED ON MAP (POINTS) (continued)

Map ID	Type	Name	Contact	Phone
41	REPEATED MEASUREMENT SITE	DB - MOORED BUOY, NORFOLK, VA	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
42	REPEATED MEASUREMENT SITE	DB - NOS, 8639348 - MONEY POINT, VA	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
43	REPEATED MEASUREMENT SITE	PORTS - MONEY POINT, S. BR. ELIZABETH RIVER	PORTS PROGRAM	301-713-4392
44	REPEATED MEASUREMENT SITE	WQ - STATION EBB01	CHESAPEAKE BAY PROGRAM	800-968-7229
45	REPEATED MEASUREMENT SITE	WQ - STATION EBE1	CHESAPEAKE BAY PROGRAM	800-968-7229
46	REPEATED MEASUREMENT SITE	WQ - STATION EBE1-E	CHESAPEAKE BAY PROGRAM	800-968-7229
47	REPEATED MEASUREMENT SITE	WQ - STATION EBE2	CHESAPEAKE BAY PROGRAM	800-968-7229
48	REPEATED MEASUREMENT SITE	WQ - STATION ELE01	CHESAPEAKE BAY PROGRAM	800-968-7229
49	REPEATED MEASUREMENT SITE	WQ - STATION LAF1	CHESAPEAKE BAY PROGRAM	800-968-7229
50	REPEATED MEASUREMENT SITE	WQ - STATION LFA01	CHESAPEAKE BAY PROGRAM	800-968-7229
51	REPEATED MEASUREMENT SITE	WQ - STATION LFB01	CHESAPEAKE BAY PROGRAM	800-968-7229
52	REPEATED MEASUREMENT SITE	WQ - STATION SBA1	CHESAPEAKE BAY PROGRAM	800-968-7229
53	REPEATED MEASUREMENT SITE	WQ - STATION SBC1	CHESAPEAKE BAY PROGRAM	800-968-7229
54	REPEATED MEASUREMENT SITE	WQ - STATION SBD1	CHESAPEAKE BAY PROGRAM	800-968-7229
55	REPEATED MEASUREMENT SITE	WQ - STATION SBE1	CHESAPEAKE BAY PROGRAM	800-968-7229
56	REPEATED MEASUREMENT SITE	WQ - STATION SBE2	CHESAPEAKE BAY PROGRAM	800-968-7229
57	REPEATED MEASUREMENT SITE	WQ - STATION SBE3	CHESAPEAKE BAY PROGRAM	800-968-7229
58	REPEATED MEASUREMENT SITE	WQ - STATION SBE4	CHESAPEAKE BAY PROGRAM	800-968-7229
59	REPEATED MEASUREMENT SITE	WQ - STATION SBE5	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (LINES)

Map ID	Type	Name	Contact	Phone
60	PIPELINE	PIPELINE		

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
61	MILITARY	NAVAL AIR STATION OCEANA (MIDWAY MANOR)		
62	MILITARY	NAVAL AMPHIBIOUS BASE LITTLE CREEK		
63	MILITARY	NAVAL MEDICAL CENTER PORTSMOUTH		
64	MILITARY	NAVAL STATION NORFOLK		
65	MILITARY	NAVAL SUPPORT ACTIVITY NORFOLK		
66	MILITARY	NORFOLK NAVAL SHIPYARD		
67	MILITARY	SAINT JULIEN'S CREEK ANNEX		
68	NATURE CONSERVANCY	NORTH LANDING RIVER	THE NATURE CONSERVANCY	703-841-5300
69	PARK	BARRAUD PARK	CITY OF NORFOLK	
70	PARK	BAYVILLE PARK	CITY OF VIRGINIA BEACH	
71	PARK	CAMPOSTELLA PARK	CITY OF CHESAPEAKE	
72	PARK	CHESAPEAKE CITY PARK	CITY OF CHESAPEAKE	
73	PARK	CRESTWOOD PARK	CITY OF CHESAPEAKE	
74	PARK	GREENBRIER SPORTS PARK	CITY OF CHESAPEAKE	
75	PARK	INDIAN RIVER PARK	CITY OF CHESAPEAKE	
76	PARK	JAKE SEARS PARK	CITY OF VIRGINIA BEACH	
77	PARK	JOHNSON PARK PLAY AREA	CITY OF CHESAPEAKE	
78	PARK	KEMPSVILLE PARK	CITY OF VIRGINIA BEACH	
79	PARK	LAFAYETTE PARK	CITY OF NORFOLK	

DISPLAYED ON MAP (POLYGONS) (continued)				
Map ID	Type	Name	Contact	Phone
80	PARK	LAKE WHITEHURST CITY PARK	CITY OF NORFOLK	
81	PARK	LAKESIDE PARK	CITY OF CHESAPEAKE	
82	PARK	LAKESIDE PARK - NORFOLK	CITY OF NORFOLK	
83	PARK	LEVEL GREEN PARK	CITY OF VIRGINIA BEACH	
84	PARK	MOUNT TRASHMORE PARK	CITY OF VIRGINIA BEACH	
85	PARK	NORTHSIDE PARK	CITY OF NORFOLK	
86	PARK	OAK GROVE LAKE PARK	CITY OF CHESAPEAKE	
87	PARK	PARADISE CREEK NATURE PARK	ELIZABETH RIVER PROJECT	
88	PARK	PARKVIEW PLAY AREA	CITY OF CHESAPEAKE	
89	PARK	PLYMOUTH PARK	CITY OF CHESAPEAKE	
90	PARK	TOWN POINT PARK	CITY OF NORFOLK	
91	PARK	WOODSTOCK PARK	CITY OF VIRGINIA BEACH	
ALSO PRESENT IN MAPPED AREA (POINTS)				
Type	Name	Contact	Phone	
COAST GUARD	ADM LAW JUDGE NORFOLK		757-441-3312	
COAST GUARD	ATLANTIC AREA		757-398-6000	
COAST GUARD	ATLANTIC MAR CTR-AMC			
COAST GUARD	CGC BELUGA			
COAST GUARD	COAST GUARD LIAISON OFFICER		757-445-2488	
COAST GUARD	FDCC ATLANTIC		757-852-3400	
COAST GUARD	FIFTH DISTRICT		757-398-6000	
COAST GUARD	FINANCE CENTER		757-523-6000	
COAST GUARD	INVESTIGATIVE SERVICES CHESAPEAKE REGION		757-398-6262	
COAST GUARD	MAINTENANCE & LOGISTICS COMMAND ATLANTIC		757-628-4275	
COAST GUARD	MSO HAMPTON ROADS		804-441-3302	
COAST GUARD	SECTOR HAMPTON ROADS			
COAST GUARD	STA LITTLE CREEK		757-464-9371	
COAST GUARD	TACLET NORTH		757-856-2559	
COAST GUARD	TRAINING QUOTA MGMT CENTER PORTSMOUTH		757-366-6577	
COAST GUARD	USJFCOM			
ALSO PRESENT IN MAPPED AREA (POLYGONS)				
Type	Name	Contact	Phone	
STATE PROTECTED AREA	BLUE CRAB SANCTUARY	VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200	

JURISDICTIONS

COUNTY: CHESAPEAKE CITY, NORFOLK CITY, PORTSMOUTH CITY, VIRGINIA BEACH CITY
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, NORFOLK DISTRICT

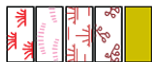
FEMA:
EPA:

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	1,320.44	2.06
10B	Freshwater Marshes	320.14	0.50
10C	Swamps	4,127.88	6.45
10D	Scrub and Shrub Wetlands	193.07	0.30
7	Exposed Tidal Flats	0.05	0.00



ESI SHORELINE HABITAT TYPES

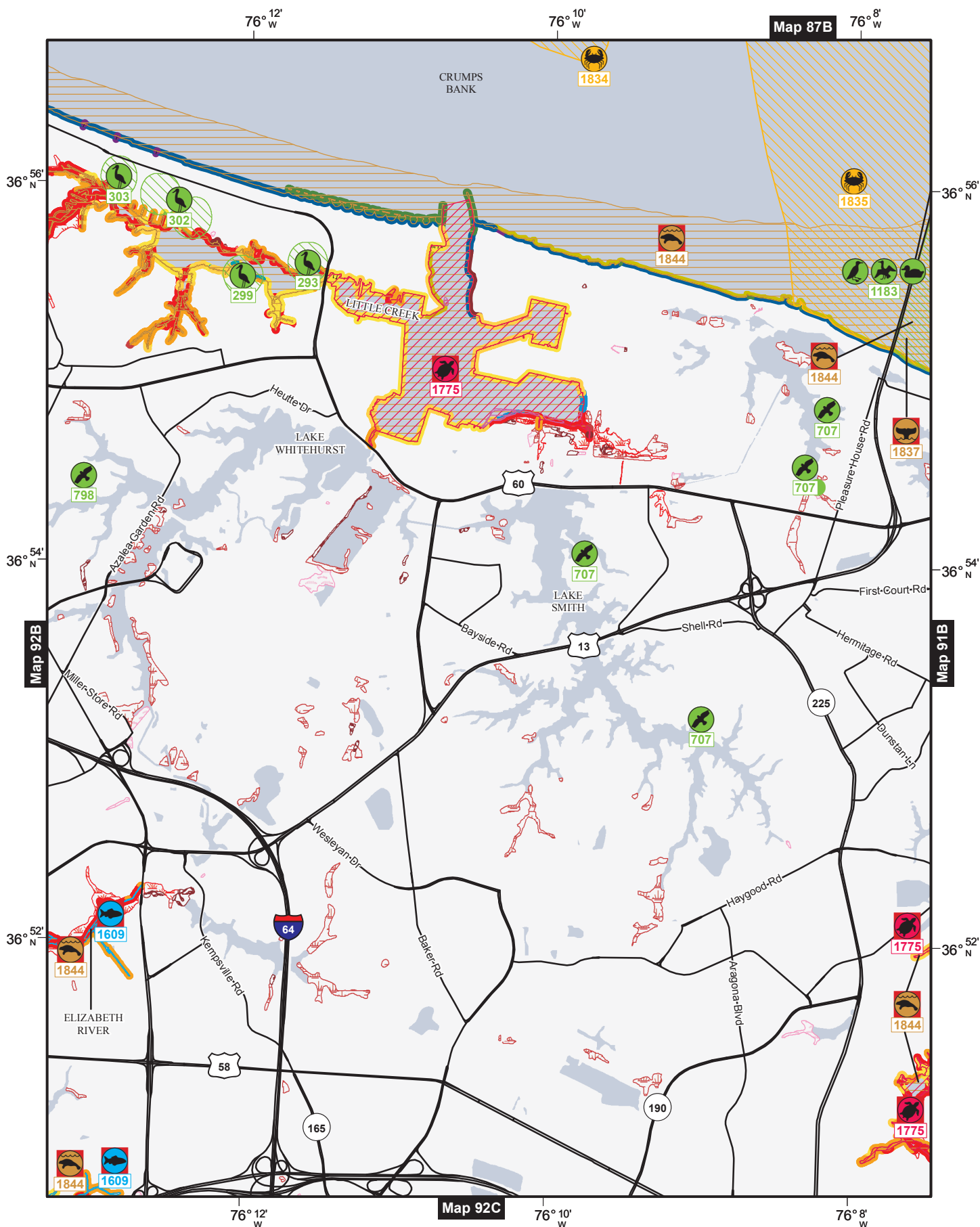
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	200,465.68	124.56	40%
10B	Freshwater Marshes	212.32	0.13	< 1%
10C	Swamps	17,656.29	10.97	4%
10D	Scrub and Shrub Wetlands	6,034.82	3.75	1%
9A	Sheltered Tidal Flats	118.26	0.07	< 1%
9B	Vegetated Low Banks	76,423.54	47.49	15%
8B	Sheltered, Solid Man-Made Structures	96,651.61	60.06	19%
8C	Sheltered Riprap	65,752.16	40.86	13%
7	Exposed Tidal Flats	5,964.38	3.71	1%
6B	Riprap	7,272.93	4.52	1%
5	Mixed Sand and Gravel Beaches	996.06	0.62	< 1%
4	Coarse Grained Sand Beaches	5,221.39	3.24	1%
3A	Fine to Medium Grained Sand Beaches	6,976.75	4.34	1%
3B	Scarps and Steep Slopes (Sand)	4,682.62	2.91	1%
1B	Exposed, Solid Man-Made Structures	5,857.63	3.64	1%

Total ESI Shoreline: 500,286.43 Total ESI Shoreline: 310.86
 Total Shoreline: 443,582.77 Total Shoreline: 275.63

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 92A
Chesapeake South



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 92A
Chesapeake South

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
293	Wading	YC night-heron	Nesting			3 Pairs											
299	Wading	YC night-heron	Nesting			7 Pairs											
302	Wading	Great egret	Nesting			68 Nests											
	Wading	Green heron	Nesting			2 Pairs											
	Wading	YC night-heron	Nesting			9 Pairs											
303	Wading	Green heron	Nesting			7 Pairs											
	Wading	YC night-heron	Nesting			9 Pairs											
707	Raptor	Bald eagle	Roosting			-											
798	Raptor	Bald eagle	Nesting			1 Nest											
1183	Alcid	Wintling	Wintling			10S											
	Diving	Common loon	Wintling			1,000S											
	Diving	D. crested cormorant	Wintling			1,000S											
	Diving	Red-throated loon	Wintling			1,000S											
	Pelagic	Northern gannet	Wintling			1,000S											
	Waterfowl	Long-tailed duck	Wintling			10S											
	Waterfowl	Red-breasted merganser	Wintling			100S											

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
1609	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-											
	Diadromous	Striped bass	Nursery Area			-											

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence											
				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	Abundant											
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common											

INVERTEBRATES




Map ID	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				
1834	Crab	Blue crab	Concentration Area			Highly Abundant-Wint													-	-	Dec-Mar	Dec-Mar
1835	Crab	Blue crab	Spawning Area			Spawning													May-Sep	May-Oct	May-Nov	May-Sep

MARINE MAMMALS




Map ID	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			
1837	Whale	Fin whale	General Distribution	E/E	E	Common													-	-	-
	Whale	Humpback whale	General Distribution	E/E	E	Uncommon													-	-	-
	Whale	Humpback whale	General Distribution	E/E	E	Common													-	-	-
1844	Manatee	West Indian manatee	General Distribution	-/E	E	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	Wintering			100S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			100S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
 Pelagic	Northern gannet	Wintering			100S													-	-	-	-
 Waterfowl	Scoters	Wintering			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	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
	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

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				
	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	Common												-	-	-	Apr-Oct*	Apr-Oct*
	K. ridley sea turtle	General Distribution	E/E	E	Rare												-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E	Abundant												-	-	-	May-Jun	May-Jun
	Leatherback sea turtle	General Distribution	E/E	E	Common												-	-	-	May-Jun	May-Jun
	Leatherback sea turtle	General Distribution	E/E	E	Rare												-	-	-	Mar-Dec*	Mar-Dec*
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct*	Apr-Oct*
	Loggerhead sea turtle	General Distribution	T/T	T	Very Abundant												-	-	-	May-Jun	May-Jun
	Loggerhead sea turtle	General Distribution	T/T	T	Rare												-	-	-	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-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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	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													-	-	-	-
	D. crested cormorant													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Shearwaters													-	-	-	-
	Storm-petrels													-	-	-	-
	Phalaropes													-	-	-	-

FISH

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

Chesapeake South: Map 92A

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Atlantic herring													-	-	-	Feb-Jun	Feb-Jun
	Atlantic herring													-	-	-	Jan-Jun	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	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	Apr-Nov	Apr-Nov
	Red drum													-	-	-	May-Nov	May-Nov
	Sheepshead													-	-	-	Apr-Nov	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	Apr-Sep	Jan-Dec	Jan-Dec
	Silversides													-	-	-	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jun-Dec
	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
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Jan-Dec
	Cobia													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	Jun-Sep
	Lined seahorse													-	-	-	-	May-Nov
	Spanish mackerel													May-Oct	-	-	-	Jan-Dec
	Spiny dogfish													-	-	-	-	May-Sep
														-	-	-	Nov-May	Nov-May
														-	-	-	-	-
														-	-	-	-	-
														-	-	-	-	-
														-	-	-	-	-


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
	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													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-
	Short-beaked common dolphin													-	-	-	-
	Gray seal													-	-	-	-
	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	141.07	0.22
10B	Freshwater Marshes	28.14	0.04
10C	Swamps	227.66	0.36
10D	Scrub and Shrub Wetlands	27.32	0.04
7	Exposed Tidal Flats	0.04	0.00

ESI SHORELINE HABITAT TYPES

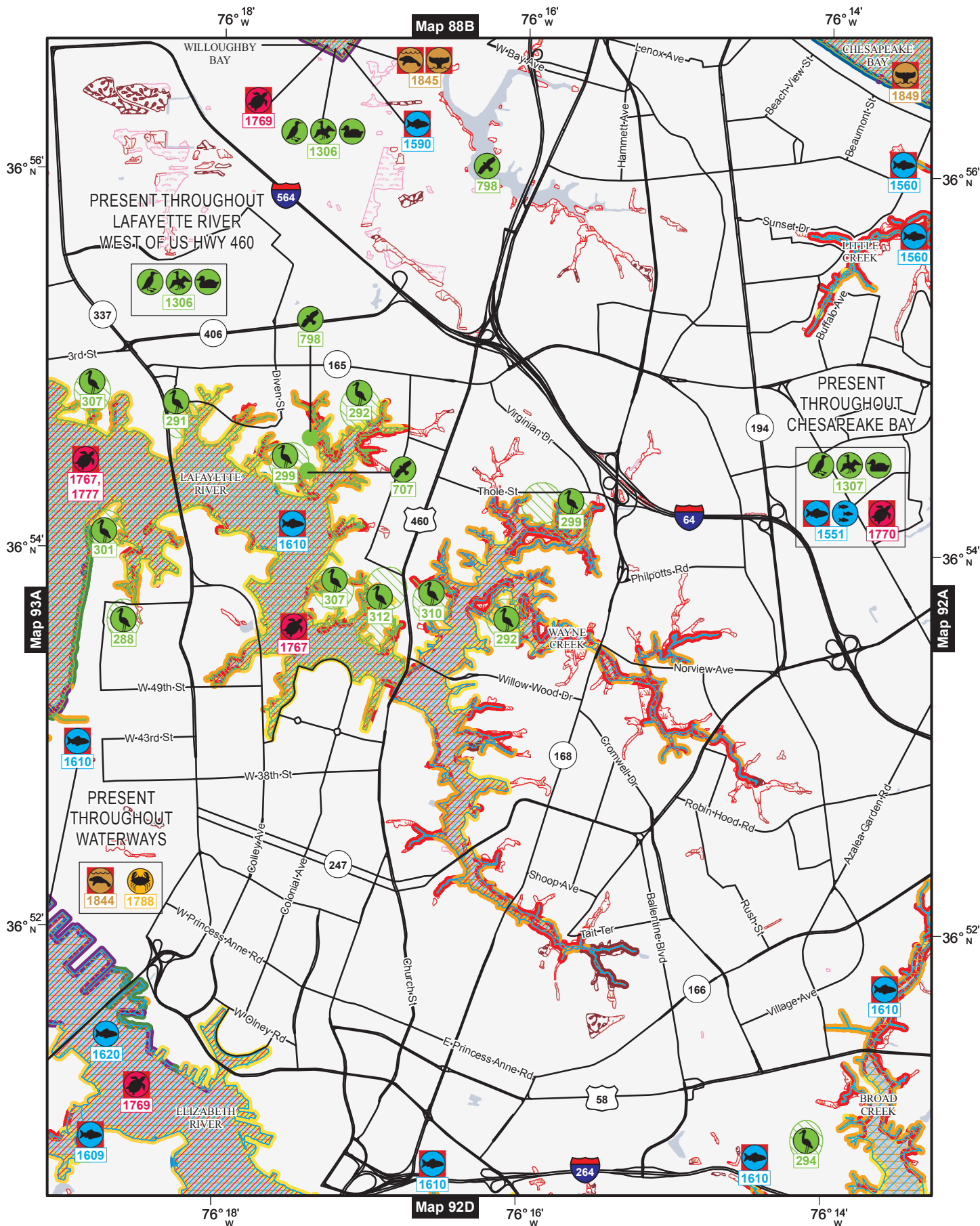
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	26,168.62	16.26	33%
10C	Swamps	165.74	0.10	< 1%
10D	Scrub and Shrub Wetlands	806.72	0.50	1%
9B	Vegetated Low Banks	13,052.18	8.11	16%
8B	Sheltered, Solid Man-Made Structures	13,154.81	8.17	16%
8C	Sheltered Riprap	6,391.79	3.97	8%
7	Exposed Tidal Flats	5,964.38	3.71	7%
6B	Riprap	3,168.95	1.97	4%
5	Mixed Sand and Gravel Beaches	273.08	0.17	< 1%
4	Coarse Grained Sand Beaches	498.76	0.31	1%
3A	Fine to Medium Grained Sand Beaches	5,629.66	3.50	7%
3B	Scarps and Steep Slopes (Sand)	4,488.28	2.79	6%
1B	Exposed, Solid Man-Made Structures	257.82	0.16	< 1%

Total ESI Shoreline: 80,020.80 Total ESI Shoreline: 49.72
 Total Shoreline: 63,716.37 Total Shoreline: 39.59

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



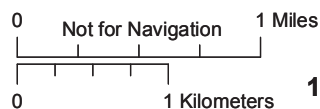


Map 92B

Chesapeake South



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 92B
Chesapeake South

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)	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
288	Wading	YC night-heron	Nesting				2 Pairs													Apr-Jul	-	-	-	-
291	Wading	YC night-heron	Nesting				4 Pairs													Apr-Jul	-	-	-	-
292	Wading	YC night-heron	Nesting				5 Pairs													Apr-Jul	-	-	-	-
294	Wading	Green heron	Nesting				1 Pair													Apr-Aug	-	-	-	-
	Wading	YC night-heron	Nesting				3 Pairs													Apr-Jul	-	-	-	-
299	Wading	YC night-heron	Nesting				7 Pairs													Apr-Jul	-	-	-	-
301	Wading	YC night-heron	Nesting				9 Pairs													Apr-Jul	-	-	-	-
307	Wading	YC night-heron	Nesting				11 Pairs													Apr-Jul	-	-	-	-
310	Wading	Green heron	Nesting				8 Pairs													Apr-Aug	-	-	-	-
312	Wading	YC night-heron	Nesting				13 Pairs													Apr-Jul	-	-	-	-
707	Raptor	Bald eagle	Roosting				-													-	-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-	-
1306	Diving	Common loon	Wintering				100S													-	-	-	-	-
	Diving	D. crested cormorant	Wintering				1,000S													-	Mar-May	Aug-Nov	-	-
	Diving	Grebes	Wintering				100S													-	-	-	-	-
	Diving	Red-throated loon	Wintering				100S													-	-	-	-	-
	Pelagic	Northern gannet	Wintering				100S													-	-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				Present													-	-	-	-	-
	Waterfowl	Scooters	Wintering				10,000S													-	-	-	-	-
1307	Diving	Common loon	Wintering				100S													-	-	-	-	-
	Diving	D. crested cormorant	Wintering				100S													-	Mar-May	Aug-Nov	-	-
	Diving	Grebes	Wintering				100S													-	-	-	-	-
	Diving	Red-throated loon	Wintering				100S													-	-	-	-	-
	Pelagic	Northern gannet	Wintering				100S													-	-	-	-	-
	Waterfowl	Scooters	Wintering				10,000S													-	-	-	-	-

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	D					
1551	Diadromous	Alewife	Migration				-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	American shad	Migration				-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Atlantic sturgeon	General Distribution				-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Migration				-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Hickory shad	Migration				-													-	-	-	Jun-Sep	Feb-May
	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

FISH (continued)

Map ID	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				
1560	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	Striped bass	Migration			-													-	-	-	Feb-Jun
1590	Diadromous	Alewife	Migration			-													-	-	Aug-Nov	Feb-Apr
	Diadromous	American shad	Migration			-													-	-	Aug-Nov	Feb-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	Jan-Dec	Jan-Dec
	Diadromous	Atlantic sturgeon	Migration	-/E	E	Fall Run Migration													-	-	-	Jun-Nov
	Diadromous	Atlantic sturgeon	Migration	-/E	E	Spring Run Migration													-	-	-	Apr-May
	Diadromous	Blueback herring	Migration			-													-	-	Aug-Nov	Mar-Jun
	Diadromous	Hickory shad	Migration			-													-	-	Jun-Sep	Feb-May
	Diadromous	Striped bass	Nursery Area			-													-	-	Jan-Dec	-
1609	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Jan-Dec	-
1610	Diadromous	Alewife	Migration			-													-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	Jan-Dec	Jan-Dec
	Diadromous	Blueback herring	Migration			-													-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Nursery Area			-													-	-	Jan-Dec	-
1620	Diadromous	Alewife	Migration			-													-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration			-													-	-	Aug-Nov	Mar-Jun

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	Common													-	-	-	Jul-Oct	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	May-Dec*	-
1769	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	May-Dec*	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	Jul-Oct	-
	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	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	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
1770	Turtle	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	Jul-Oct	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	May-Dec*	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Abundant													-	-	-	May-Jun	May-Jun
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Rare													-	-	-	Nov-Dec	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	-	Apr-Oct*	Apr-Oct*
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Very Abundant													-	-	-	May-Jun	May-Jun
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Rare													-	-	-	Nov-Dec	Nov-Dec
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	-	Apr-Oct*	Apr-Oct*

REPTILES & AMPHIBIANS (continued)

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
1777	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	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-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		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		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													-	-	-	
1845	Manatee	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	
	Whale	Humpback whale	General Distribution	E/E	E	Uncommon													-	-	-	
1849	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													-	-	-	-
	Gull/Tern													-	-	-	-
	D. crested cormorant													-	-	-	-
	Pelagic													-	-	-	-
	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					
	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
	Estuarine Nursery													-	-	-	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													-	-	-	Feb-Jun	Feb-Jun
	Atlantic herring													-	-	-	-	Jan-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	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					
	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													-	-	-	-	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleamose skate													-	-	-	-	Jun-Dec
	Cleamose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep
	Spiny dogfish													-	-	-	Nov-May	Nov-May
														-	-	-	-	-
														-	-	-	-	-
														-	-	-	-	-



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					
	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
	Cephalopod													Jun-Nov	-	-	Jan-Dec	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Crab													-	-	-	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Shrimp													-	-	-	May-Oct	May-Oct
	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													May-Aug	May-Aug	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													-	-	-	-
	Harbor porpoise													-	-	-	-
	Pinniped													-	-	-	-
	Short-beaked common dolphin													-	-	-	-
	Gray seal													-	-	-	-
	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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	381.80	0.60
10B	Freshwater Marshes	101.72	0.16
10C	Swamps	86.53	0.14
10D	Scrub and Shrub Wetlands	98.28	0.15
7	Exposed Tidal Flats	0.00	0.00

ESI SHORELINE HABITAT TYPES

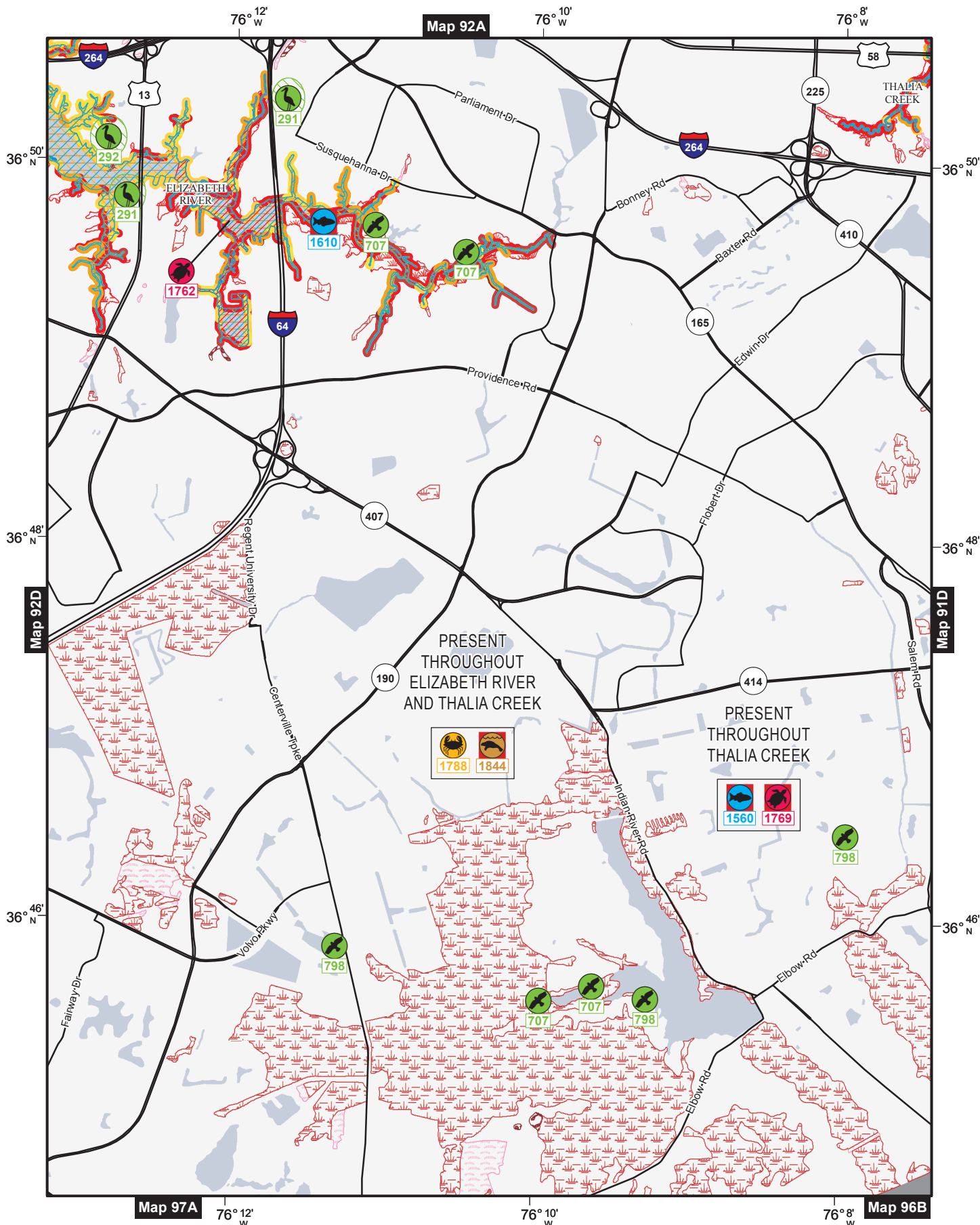
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	71,488.00	44.42	41%
10C	Swamps	224.09	0.14	< 1%
10D	Scrub and Shrub Wetlands	2,991.40	1.86	2%
9B	Vegetated Low Banks	37,112.34	23.06	21%
8B	Sheltered, Solid Man-Made Structures	31,977.62	19.87	18%
8C	Sheltered Riprap	19,848.52	12.33	11%
6B	Riprap	4,103.98	2.55	2%
5	Mixed Sand and Gravel Beaches	138.90	0.09	< 1%
4	Coarse Grained Sand Beaches	544.55	0.34	< 1%
3A	Fine to Medium Grained Sand Beaches	1,347.09	0.84	1%
1B	Exposed, Solid Man-Made Structures	5,599.81	3.48	3%

Total ESI Shoreline: 175,376.29 Total ESI Shoreline: 108.97
 Total Shoreline: 151,000.00 Total Shoreline: 93.83

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

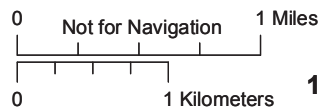




Map 92C Chesapeake South



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 92C
Chesapeake South

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	Eggs	Larvae	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
291	Wading	YC night-heron	Nesting		4 Pairs													Apr-Jul	-	-	-	-
292	Wading	YC night-heron	Nesting		5 Pairs													Apr-Jul	-	-	-	-
707	Raptor	Bald eagle	Roosting		-													-	-	-	-	-
798	Raptor	Bald eagle	Nesting		1 Nest													Dec-Jun	-	-	-	-

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					
1560	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	Striped bass	Migration		-													-	-	-	-	Feb-Jun
1610	Diadromous	Alewife	Migration		-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-/E E	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Blueback herring	Migration		-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Nursery Area		-													-	-	Mar-May	Jan-Dec	-

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					
1762	Turtle	Diamondback terrapin	Concentration Area		High													May-Aug	-	-	Apr-Oct	Apr-Oct
1769	Turtle	Green sea turtle	General Distribution	T/T T	Rare													-	-	-	May-Dec*	-
	Turtle	Green sea turtle	General Distribution	T/T T	Common													-	-	-	Jul-Oct	-
	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	Leatherback sea turtle	General Distribution	E/E E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	Turtle	Leatherback sea turtle	General Distribution	E/E E	Common													-	-	-	May-Jun	May-Jun
	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	MDVA S F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
						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
				S	F	J	F	M	A	M	J	J	A	S	O	N	D				
1844	Manatee	West Indian manatee	General Distribution	-/E	E													-	-	-	-

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	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Feb-Apr		
		American eel													-	-	-	Jan-May		
		Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct		
	Estuarine Nursery	Gizzard shad													Mar-Jun	-	-	Jan-Dec		
		Striped bass													-	-	-	Jan-Dec		
		Atlantic croaker													-	-	Dec-Apr	Jan-Dec		
		Atlantic croaker													-	-	Apr-Dec	Jan-Dec		
		Atlantic herring													-	-	-	Jan-Jun		
		Atlantic herring													-	-	-	Feb-Jun		
		Atlantic menhaden													-	-	-	Jan-Dec		
		Black drum													Apr-Jun	-	-	Apr-Dec		
		Black sea bass													-	-	-	Apr-Nov		
		Bluefish													-	-	-	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		
	Estuarine Resident	White perch												-	-	-	Jan-Dec	Jan-Dec		
		Winter flounder													-	-	-	Dec-Mar	Jan-Dec	
		Pipefish													-	-	-	Jan-Dec	Jan-Dec	
		Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec	
		Silversides													-	-	-	Jan-Dec	Jan-Dec	
		Anchovies													Apr-Sep	-	-	-	Jan-Dec	Jan-Dec
		Striped burrfish													-	-	-	May-Oct	May-Oct	
		Atlantic spadefish													-	-	-	Jun-Sep	Jun-Sep	
		Clearnose skate													-	-	-	-	Jun-Dec	Jan-Dec
		Clearnose skate													-	-	-	-	Jan-Dec	Jan-Dec
	Marine Benthic	Cownose ray												-	-	-	May-Oct	May-Oct	May-Oct	
		Northern searobin													Jun-Jul	-	-	-	Apr-Dec	Apr-Dec
		Northern searobin													May-Jul	-	-	-	Apr-Sep	Apr-Sep
		Red hake													-	-	-	-	Sep-May*	Sep-May*





FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Cobia													-	-	-	-	Jun-Sep
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep
	Spiny dogfish													-	-	-	Nov-May	Nov-May

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
	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
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-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

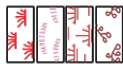
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-

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	237.66	0.37
10B	Freshwater Marshes	123.10	0.19
10C	Swamps	3,090.06	4.83
10D	Scrub and Shrub Wetlands	10.25	0.02



ESI SHORELINE HABITAT TYPES

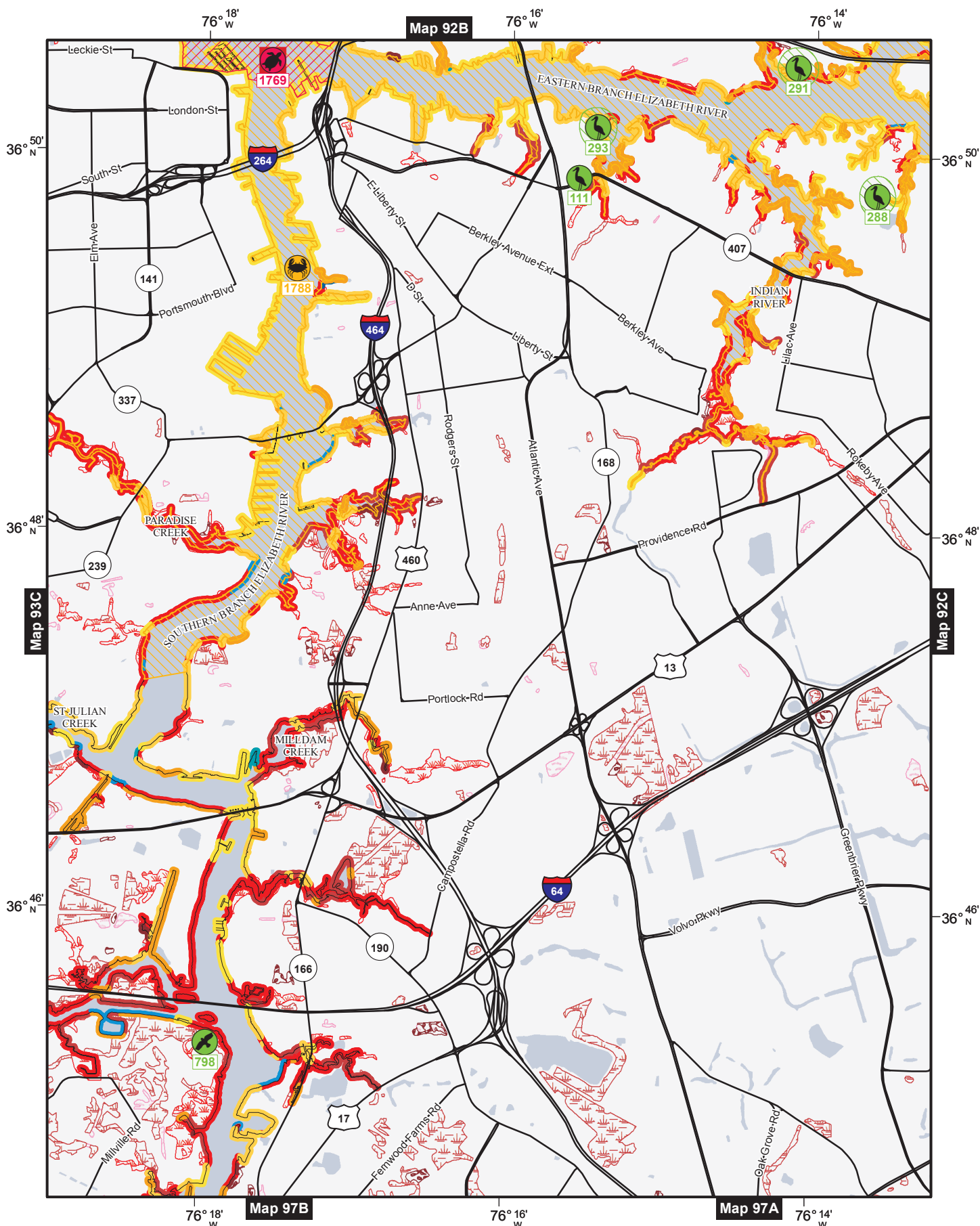
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	32,358.57	20.11	55%
10C	Swamps	4,049.44	2.52	7%
10D	Scrub and Shrub Wetlands	451.82	0.28	1%
9B	Vegetated Low Banks	7,954.24	4.94	14%
8B	Sheltered, Solid Man-Made Structures	6,503.62	4.04	11%
8C	Sheltered Riprap	7,100.15	4.41	12%
4	Coarse Grained Sand Beaches	192.31	0.12	< 1%

Total ESI Shoreline: 58,610.16 Total ESI Shoreline: 36.42
 Total Shoreline: 54,741.74 Total Shoreline: 34.01

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

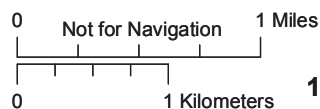




Map 92D Chesapeake South



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 92D
Chesapeake South

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	MD/VA	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
111	Wading	Great egret		Nesting			71 Nests													Apr-Aug	-	-	-	-
288	Wading	YC night-heron		Nesting			2 Pairs													Apr-Jul	-	-	-	-
291	Wading	YC night-heron		Nesting			4 Pairs													Apr-Jul	-	-	-	-
293	Wading	YC night-heron		Nesting			3 Pairs													Apr-Jul	-	-	-	-
798	Raptor	Bald eagle		Nesting			1 Nest													Dec-Jun	-	-	-	-

REPTILES & AMPHIBIANS


Map ID	Subelement	Species	MD/VA	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
1769	Turtle	Green sea turtle		General Distribution	T/T	T	Common													-	-	-	Jul-Oct	-
	Turtle	Green sea turtle		General Distribution	T/T	T	Rare													-	-	-	May-Dec*	-
	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	Leatherback sea turtle		General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	Turtle	Leatherback sea turtle		General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-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	MD/VA	Mapping Qualifier	S	F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
								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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)






FISH

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

MARINE MAMMALS

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





FISH

		Monthly Presence																
Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	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													-	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	-	-
	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
	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
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Clearnose skate													-	-	-	-	Jun-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

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

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
 Cephalopod	Squid													Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
 Crab	Blue 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				
 Dolphin	Bottlenose dolphin													May-Aug	May-Aug	-	-

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	0.87
 10B	Freshwater Marshes	0.10
 10C	Swamps	1.13
 10D	Scrub and Shrub Wetlands	0.09

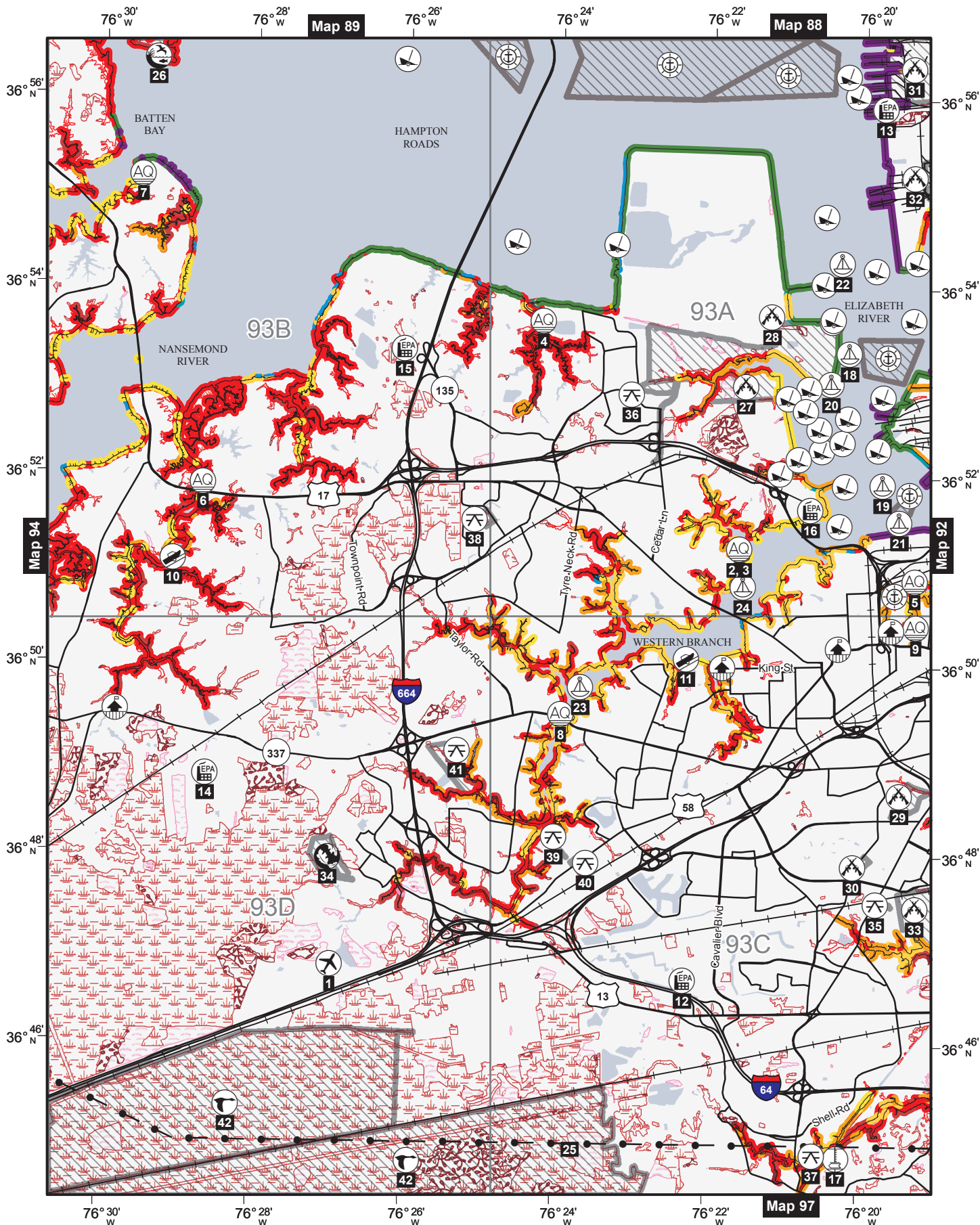
ESI SHORELINE HABITAT TYPES		
ESI Rank	Shoreline Habitat Classification	% of ESI Shoreline
 10A	Salt and Brackish Water Marshes	38%
 10B	Freshwater Marshes	< 1%
 10C	Swamps	7%
 10D	Scrub and Shrub Wetlands	1%
 9A	Sheltered Tidal Flats	< 1%
 9B	Vegetated Low Banks	10%
 8B	Sheltered, Solid Man-Made Structures	24%
 8C	Sheltered Riprap	17%
 5	Mixed Sand and Gravel Beaches	< 1%
 4	Coarse Grained Sand Beaches	2%
 3B	Scarps and Steep Slopes (Sand)	< 1%

Total ESI Shoreline: 186,279.19
Total ESI Shoreline: 115.75
Total Shoreline: 174,124.66
Total Shoreline: 108.20

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 93
Chesapeake South



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 93
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
Map ID	Type	Name	Contact Phone
1	AIRPORT	HAMPTON ROADS EXECUTIVE	
2	AQUACULTURE	OYSTER NON-COMM EDMONDS, JOHN RF#99-1504	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
3	AQUACULTURE	OYSTER NON-COMM EDMONDS, JOHN RF#99-1679	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
4	AQUACULTURE	OYSTER NON-COMM HOFFLER CREEK WILDLIFE RF#99-2130	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
5	AQUACULTURE	OYSTER NON-COMM MORELAND RF#98-1875	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
6	AQUACULTURE	OYSTER NON-COMM POWELL, YANCY RF#98-1719	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
7	AQUACULTURE	OYSTER NON-COMM ROBERTS, CATHERINE J. RF#98-1765	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
8	AQUACULTURE	OYSTER NON-COMM SMITH, KARLA M. RF#98-1766	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
9	AQUACULTURE	OYSTER NON-COMM WILLIAMS, MARK T. RF#2001-0773	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
10	BOAT RAMP	BENNETT'S CREEK	VIRGINIA DEPT. OF GAME AND INLAND FISHERIES 804-367-1000
11	BOAT RAMP	CITY PARK	LENE PENNINGTON, VDGIF 804-367-0058
12	EPA FACILITY	CLOVERLEAF COLD STORAGE - CHESAPEAKE	PLANT MANAGER 757-487-7847
13	EPA FACILITY	INTERNATIONAL REFRIGERATED PORT SERVICES	DIVISION MANAGER 757-451-3211
14	EPA FACILITY	SUFFOLK COLD STORAGE	GENERAL MANAGER 757-673-4510
15	EPA FACILITY	SYSCO HAMPTON ROADS, INC.	FACILITIES MANAGER 757-673-4200
16	EPA FACILITY	U. S. AMINES - PORTSMOUTH PLANT	PLANT MANAGER 757-638-2614
17	LOCK AND DAM	DEEP CREEK LOCK & DAM	
18	REPEATED MEASUREMENT SITE	DB - NOS, 8638595 - SOUTH CRANEY ISLAND, VA	NATIONAL COASTAL DATA DEVELOPMENT CENTER 866-732-2382
19	REPEATED MEASUREMENT SITE	WQ - STATION ELD01	CHESAPEAKE BAY PROGRAM 800-968-7229
20	REPEATED MEASUREMENT SITE	WQ - STATION ELI2	CHESAPEAKE BAY PROGRAM 800-968-7229
21	REPEATED MEASUREMENT SITE	WQ - STATION ELI3	CHESAPEAKE BAY PROGRAM 800-968-7229
22	REPEATED MEASUREMENT SITE	WQ - STATION LE5.6	CHESAPEAKE BAY PROGRAM 800-968-7229
23	REPEATED MEASUREMENT SITE	WQ - STATION WBB05	CHESAPEAKE BAY PROGRAM 800-968-7229
24	REPEATED MEASUREMENT SITE	WQ - STATION WBE1	CHESAPEAKE BAY PROGRAM 800-968-7229

DISPLAYED ON MAP (LINES)			
Map ID	Type	Name	Contact Phone
25	PIPELINE	PIPELINE	

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
26	MANAGEMENT AREA	RAGGED ISLAND WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES	
27	MILITARY	COAST GUARD STATION PORTSMOUTH		
28	MILITARY	CRANEY ISLAND FUEL DEPOT		
29	MILITARY	NAVAL SHIPYARD NEWPORT NEWS NEW GOSPORT		
30	MILITARY	NAVAL SHIPYARD NEWPORT NEWS STANLEY CT		
31	MILITARY	NAVAL STATION NORFOLK		
32	MILITARY	NAVAL SUPPORT ACTIVITY NORFOLK		
33	MILITARY	SAINT JULIEN'S CREEK ANNEX		
34	NATURE CONSERVANCY	GREAT DISMAL SWAMP NW	THE NATURE CONSERVANCY	703-841-5300
35	PARK	BRENTWOOD PARK	CITY OF CHESAPEAKE	
36	PARK	CHURCHLAND PARK	CITY OF PORTSMOUTH	
37	PARK	DEEP CREEK LOCK PARK	CITY OF CHESAPEAKE	
38	PARK	DUNEDIN PARK	CITY OF CHESAPEAKE	
39	PARK	LAKE AHOY LANDING AND PARK	CITY OF CHESAPEAKE	
40	PARK	SOUTHWESTERN PARK	CITY OF CHESAPEAKE	
41	PARK	WESTERN BRANCH PARK	CITY OF CHESAPEAKE	
42	WILDLIFE REFUGE	GREAT DISMAL SWAMP NWR	UNITED STATES FISH AND WILDLIFE SERVICE	757-986-3705
ALSO PRESENT IN MAPPED AREA (POINTS)				
Type	Name		Contact	Phone
COAST GUARD	ANT HAMPTON ROADS			757-483-8520
COAST GUARD	CGC BEAR (WMEC 901)			757-483-8700
COAST GUARD	CGC CHOCK (WYTL 65602)			757-483-8780
COAST GUARD	CGC FRANK DREW (WLM 557)			
COAST GUARD	CGC HARRIET LANE (WMEC 903)			757-483-8720
COAST GUARD	CGC KENNEBEC (WLIC-802)			757-483-4530
COAST GUARD	CGC LEGARE (WMEC 912)			757-483-8750
COAST GUARD	CGC NORTHLAND (WMEC 904)			757-483-8730
COAST GUARD	CGC SEA HORSE (WPB - 87361)			
COAST GUARD	CGC SHEARWATER (WPB-87349)			757-483-8765
COAST GUARD	CGC TAMPA (WMEC 902)			757-483-8710
COAST GUARD	COMMAND & CONTROL ENGINEERING CENTER			757-686-2100
COAST GUARD	ESU PORTSMOUTH			757-483-8457
COAST GUARD	GRP HAMPTON ROADS (I)			757-483-8562
COAST GUARD	ISC PORTSMOUTH			757-686-4000
COAST GUARD	NESU PORTSMOUTH			757-483-8633
COAST GUARD	STA PORTSMOUTH			757-483-8527

JURISDICTIONS

COUNTY: CHES. CTY, HAMP. CTY, I. OF W. CO., N. N. CITY, NORF. CTY, PORTS. CTY, SUFF. CTY **FEMA:** REGION I
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS **EPA:** REGION 3
USACE: NORTH ATLANTIC DIVISION, NORFOLK DISTRICT

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	2,490.39	3.89
10B	Freshwater Marshes	1,760.10	2.75
10C	Swamps	15,165.45	23.70
10D	Scrub and Shrub Wetlands	1,221.11	1.91
9A	Sheltered Tidal Flats	4.44	0.01



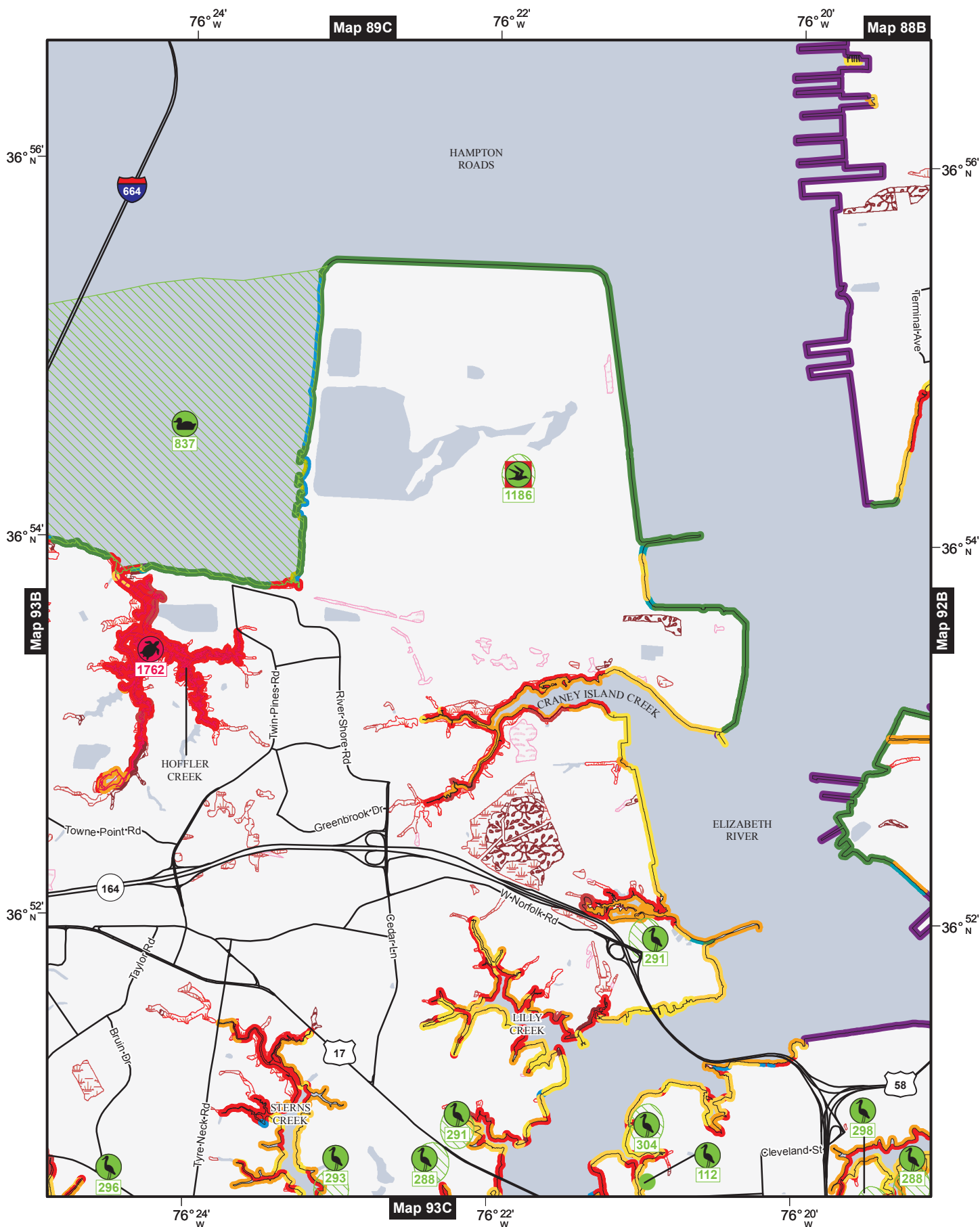
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	353,509.58	219.66	63%
10B	Freshwater Marshes	213.46	0.13	< 1%
10C	Swamps	26,782.22	16.64	5%
10D	Scrub and Shrub Wetlands	3,143.59	1.95	1%
9A	Sheltered Tidal Flats	16,703.73	10.38	3%
9B	Vegetated Low Banks	48,555.10	30.17	9%
8B	Sheltered, Solid Man-Made Structures	28,558.38	17.75	5%
8C	Sheltered Riprap	35,418.59	22.01	6%
7	Exposed Tidal Flats	879.55	0.55	< 1%
6B	Riprap	22,843.94	14.19	4%
5	Mixed Sand and Gravel Beaches	1,312.91	0.82	< 1%
4	Coarse Grained Sand Beaches	6,309.72	3.92	1%
1B	Exposed, Solid Man-Made Structures	18,958.90	11.78	3%
Total ESI Shoreline:		563,189.67	349.95	
Total Shoreline:		467,894.16	290.74	

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 93A

Chesapeake South



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 93A
Chesapeake South

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	Hatch	Internest	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
112	Wading	Great egret	Nesting				261 Nests													Apr-Aug				-
288	Wading	YC night-heron	Nesting				2 Pairs													Apr-Jul				-
291	Wading	YC night-heron	Nesting				4 Pairs													Apr-Jul				-
293	Wading	YC night-heron	Nesting				3 Pairs													Apr-Jul				-
296	Wading	YC night-heron	Nesting				6 Pairs													Apr-Jul				-
298	Wading	Green heron	Nesting				1 Pair													Apr-Aug				-
	Wading	YC night-heron	Nesting				7 Pairs													Apr-Jul				-
304	Wading	YC night-heron	Nesting				14 Pairs													Apr-Jul				-
837	Waterfowl	Bufflehead	Wintering				10S													-				-
	Waterfowl	Mergansers	Wintering				Present													-				-
	Waterfowl	Scaup	Wintering				100S													-				-
1186	Gull/Tern	Least tern	Nesting			T/-	261 Pairs													May-Jul				-

REPTILES & AMPHIBIANS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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


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				
	Canvasback	Wintering			1,000S												-	-	-	-	-
	Gadwall	Wintering			100S												-	-	-	-	-
	Green-winged teal	Wintering			100S												-	-	-	-	-
	Long-tailed duck	Wintering			Present												-	-	-	-	-
	Mallard	Wintering			10S												-	-	-	-	-
	Mergansers	Wintering			100S												-	-	-	-	-
	Northern pintail	Wintering			10S												-	-	-	-	-
	Northern shoveler	Wintering			100S												-	-	-	-	-
	Ring-necked duck	Wintering			10S												-	-	-	-	-
	Ruddy duck	Wintering			1,000S												-	-	-	-	-
	Scooters	Wintering			10,000S												-	-	-	-	-
	Scooters	Wintering			10S												-	-	-	-	-

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
	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Atlantic sturgeon	Migration	-/E	E	Spring Run Migration													-	-	-	-	Apr-May
	Atlantic sturgeon	Migration	-/E	E	Fall Run Migration													-	-	-	-	Jun-Nov
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	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	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	-
	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	-	Nov-Dec	Nov-Dec

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		Monthly Presence												Mating	Calving	Pupping	Molt
			S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
Manatee	West Indian manatee	General Distribution	-/E	E	Rare												-	-	-	-
Whale	Humpback whale	General Distribution	E/E	E	Uncommon												-	-	-	-

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
	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
	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
Estuarine Resident	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Marine Benthic	Atlantic spadefish													-	-	-	-	Jun-Sep
	Clearnose skate													-	-	-	-	Jun-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*





FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	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	Interest	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

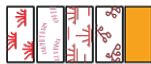
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

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	321.34	0.50
10B	Freshwater Marshes	60.52	0.09
10C	Swamps	170.33	0.27
10D	Scrub and Shrub Wetlands	151.07	0.24
9A	Sheltered Tidal Flats	4.44	0.01



ESI SHORELINE HABITAT TYPES

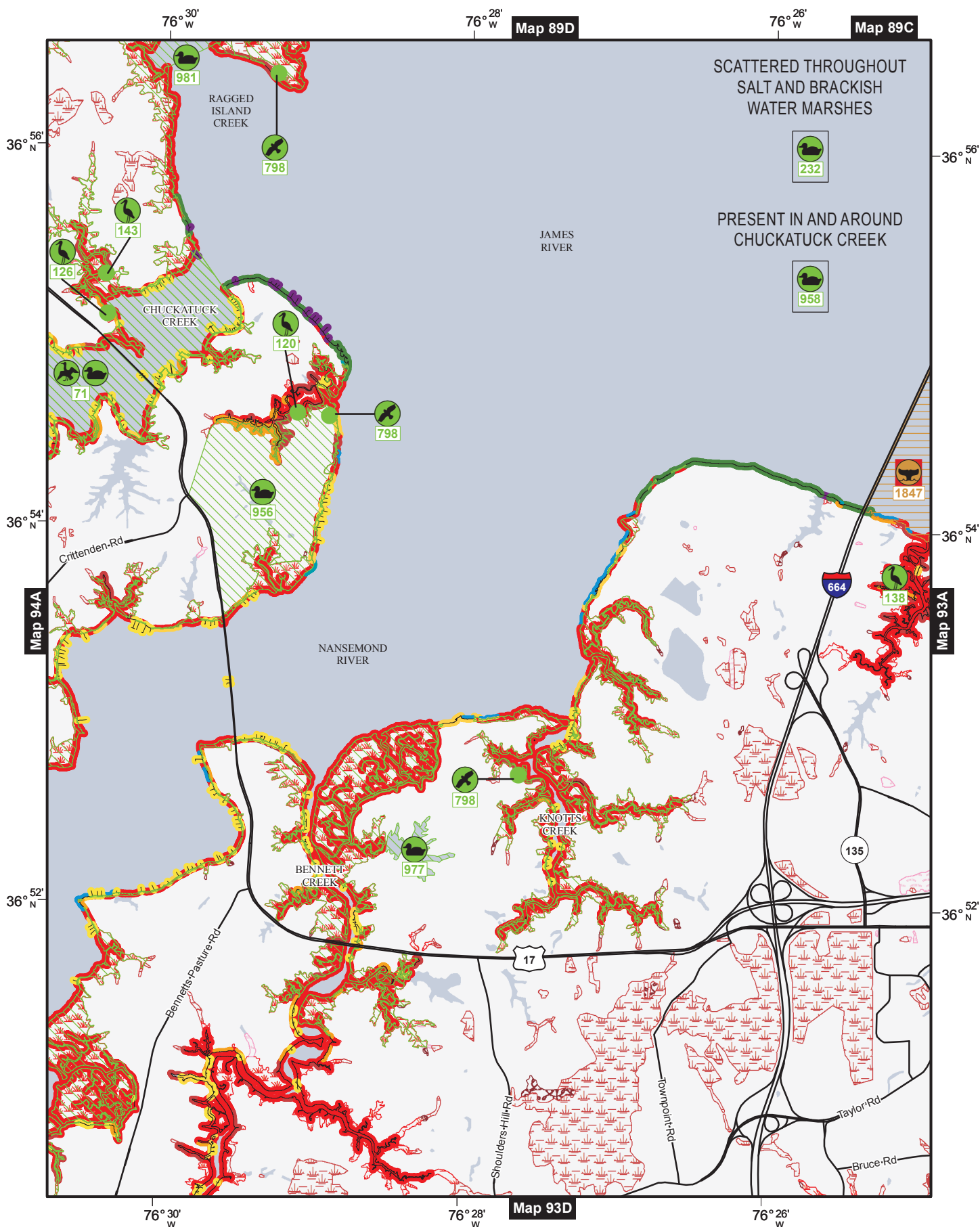
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	65,021.11	40.40	40%
10C	Swamps	2,037.36	1.27	1%
10D	Scrub and Shrub Wetlands	2,264.93	1.41	1%
9A	Sheltered Tidal Flats	16,045.91	9.97	10%
9B	Vegetated Low Banks	15,356.29	9.54	9%
8B	Sheltered, Solid Man-Made Structures	10,819.45	6.72	7%
8C	Sheltered Riprap	11,651.37	7.24	7%
7	Exposed Tidal Flats	879.55	0.55	1%
6B	Riprap	17,988.91	11.18	11%
5	Mixed Sand and Gravel Beaches	1,002.55	0.62	1%
4	Coarse Grained Sand Beaches	3,085.13	1.92	2%
1B	Exposed, Solid Man-Made Structures	18,315.40	11.38	11%

Total ESI Shoreline: 164,467.96 Total ESI Shoreline: 102.20
 Total Shoreline: 128,821.15 Total Shoreline: 80.05

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



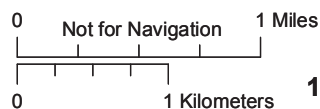


Map 93B

Chesapeake South



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 93B
Chesapeake South

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				
71	Diving	Grebes	Wintering		Present													-	-	-	-
	Waterfowl	Mergansers	Wintering		10S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering		100S													-	-	-	-
120	Wading	Great blue heron	Nesting		5 Nests													Feb-Jun	-	-	-
126	Wading	Great blue heron	Nesting		3 Nests													Feb-Jun	-	-	-
138	Wading	Great blue heron	Nesting		21 Nests													Feb-Jun	-	-	-
	Wading	Great egret	Nesting		6 Nests													Apr-Aug	-	-	-
143	Wading	Great blue heron	Nesting		7 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	-	-	-
956	Waterfowl	Canada goose	Wintering		1,000S													-	-	-	-
958	Waterfowl	Canada goose	Wintering		1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering		10S													-	-	-	-
977	Waterfowl	American wigeon	Wintering		10S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration		10S													Feb-Apr	Aug-Oct	-	-
	Waterfowl	Gadwall	Wintering		10S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering		10S													-	-	-	-
981	Waterfowl	American black duck	Wintering		Present													-	-	-	-
	Waterfowl	Blue-winged teal	Migration		10S													Feb-Apr	Aug-Oct	-	-
	Waterfowl	Common goldeneye	Wintering		Present													-	-	-	-
	Waterfowl	Green-winged teal	Wintering		10S													-	-	-	-

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA S F E/E	Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
1847	Whale	Humpback whale	General Distribution		Uncommon													-	-	-	-


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	Wintering			1,000S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			100S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Northern gannet	Wintering			100S													-	-	-	-
	American black duck	Wintering			10S													-	-	-	-
	Bufflehead	Wintering			10S													-	-	-	-
	Bufflehead	Wintering			100S													-	-	-	-
	Canada goose	Wintering			10S													-	-	-	-
	Canvasback	Wintering			1,000S													-	-	-	-
	Canvasback	Wintering			100S													-	-	-	-
	Long-tailed duck	Wintering			Present													-	-	-	-
	Mallard	Wintering			10S													-	-	-	-
	Mergansers	Wintering			Present													-	-	-	-
	Ruddy duck	Wintering			100S													-	-	-	-
	Ruddy duck	Wintering			1,000S													-	-	-	-
	Scaup	Wintering			100S													-	-	-	-
	Scaup	Wintering			10S													-	-	-	-
	Sooters	Wintering			Present													-	-	-	-
	Sooters	Wintering			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					
	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Atlantic sturgeon	Migration	-/E	E	Spring Run Migration													-	-	-	-	Apr-May
	Atlantic sturgeon	Migration	-/E	E	Fall Run Migration													-	-	-	-	Jun-Nov
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Sep	Feb-May
	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					
	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	-
	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	-	May-Jun	May-Jun
	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	-	Apr-Oct	Apr-Oct
	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	-	Nov-Dec	Nov-Dec

Chesapeake South: Map 93B

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				
	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		Concentration	Monthly Presence												Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D			
	West Indian manatee	General Distribution	-	E	Rare													-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)




BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mig.(S)	Mig.(F)	Molt
			S	F		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	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				
	Alewife																	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	American eel																	-	-	Jan-May	Jan-Dec
	Blueback herring																	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
	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																	-	-	-	Apr-Nov
	Spotted seatrout																	-	-	Nov-Apr	Apr-Dec
	Summer flounder																	May-Jul	-	Apr-Nov	Apr-Nov
	Weakfish																	-	Feb-May	Apr-Dec	Jan-Dec
	White perch																	-	May-Aug	Jan-Dec	Apr-Dec
	Pipefish																	-	-	Jan-Dec	Jan-Dec
	Silversides																	Mar-Jul	Apr-Sep	Jan-Dec	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					
 Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
 Marine Benthic	Clearnose skate													-	-	-	-	Jun-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	-	Jan-Dec
 Marine Pelagic	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Jan-Dec
	Harvestfish													-	-	-	Jul-Nov	Mar-Nov
	Lined seahorse													May-Oct	-	-	-	May-Nov
	Spanish mackerel													-	-	-	-	Jan-Dec
														-	-	-	-	May-Sep


REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Interest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
 Turtle	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					
 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	Jan-Dec	Apr-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
 Crab	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct
														-	-	-	-	May-Oct

MARINE MAMMALS

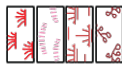
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
 Dolphin	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-
														-	-	-	-

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	1,553.74	2.43
10B	Freshwater Marshes	25.91	0.04
10C	Swamps	1,095.19	1.71
10D	Scrub and Shrub Wetlands	33.04	0.05



ESI SHORELINE HABITAT TYPES

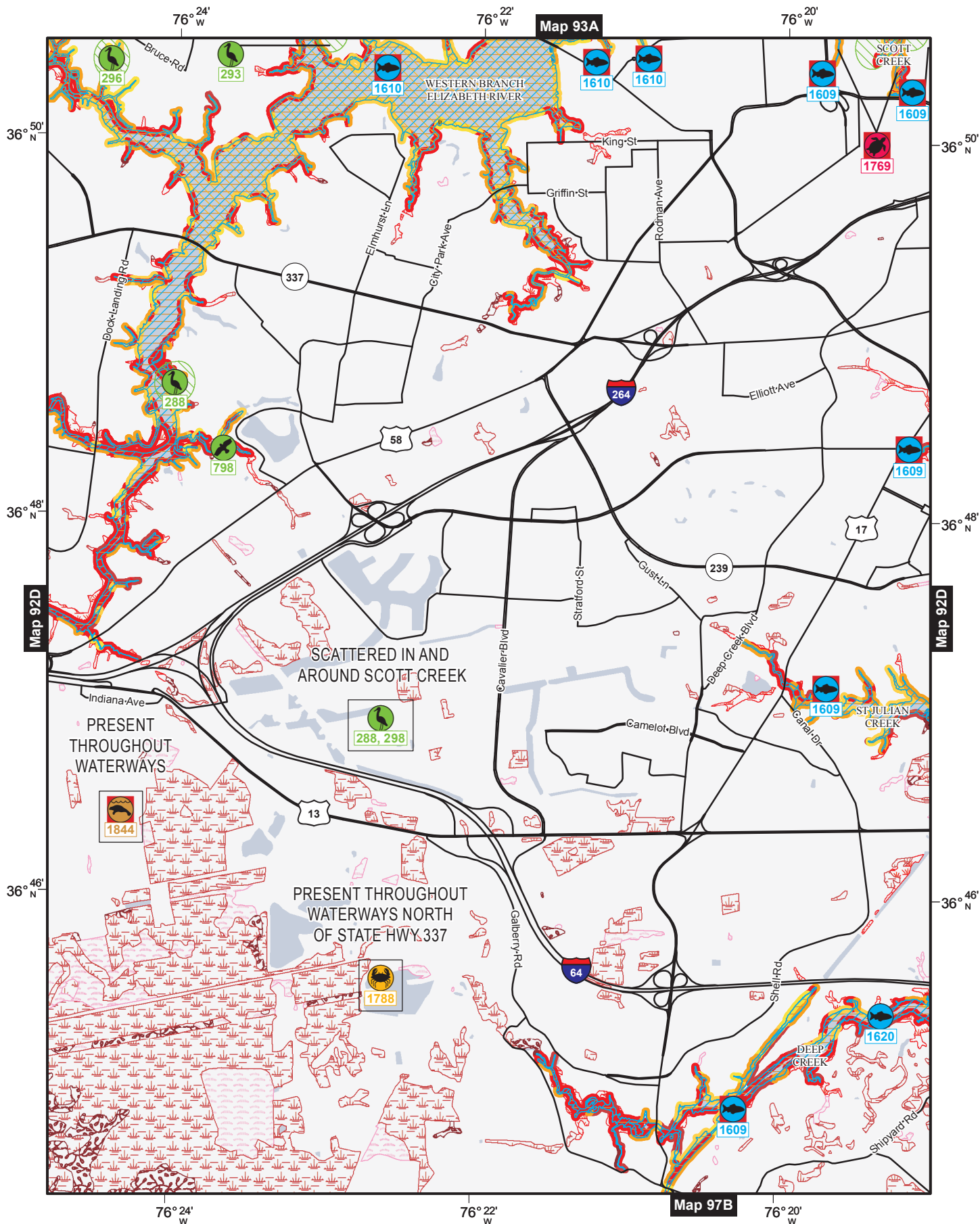
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	168,896.48	104.95	82%
10C	Swamps	7,699.12	4.78	4%
10D	Scrub and Shrub Wetlands	69.97	0.04	< 1%
9A	Sheltered Tidal Flats	657.82	0.41	< 1%
9B	Vegetated Low Banks	5,347.63	3.32	3%
8B	Sheltered, Solid Man-Made Structures	9,235.12	5.74	4%
8C	Sheltered Riprap	5,414.78	3.36	3%
6B	Riprap	4,855.03	3.02	2%
5	Mixed Sand and Gravel Beaches	310.36	0.19	< 1%
4	Coarse Grained Sand Beaches	2,715.77	1.69	1%
1B	Exposed, Solid Man-Made Structures	643.50	0.40	< 1%

Total ESI Shoreline: 205,845.58 Total ESI Shoreline: 127.91
 Total Shoreline: 188,058.17 Total Shoreline: 116.85

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%



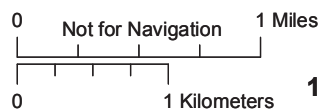
All underlying GIS data can be obtained from response.restoration.noaa.gov



Map 93C Chesapeake South



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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Map 93C
Chesapeake South

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				
288	Wading	YC night-heron	Nesting				2 Pairs													Apr-Jul	-	-	-
293	Wading	YC night-heron	Nesting				3 Pairs													Apr-Jul	-	-	-
296	Wading	YC night-heron	Nesting				6 Pairs													Apr-Jul	-	-	-
298	Wading	Green heron	Nesting				1 Pair													Apr-Aug	-	-	-
	Wading	YC night-heron	Nesting				7 Pairs													Apr-Jul	-	-	-
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					
1609	Diadromous	Atlantic sturgeon	General Distribution		-/E	E	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
1610	Diadromous	Striped bass	Nursery Area				-													-	-	Mar-May	Jan-Dec	-
	Diadromous	Alewife	Migration				-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution		-/E	E	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Blueback herring	Migration				-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Nursery Area				-													-	-	Mar-May	Jan-Dec	-
1620	Diadromous	Alewife	Migration				-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration				-													-	-	-	Aug-Nov	Mar-Jun

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
1769	Turtle	Green sea turtle	General Distribution		T/T	T	Common													-	-	-	Jul-Oct	-
	Turtle	Green sea turtle	General Distribution		T/T	T	Rare													-	-	-	May-Dec*	-
	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	Leatherback sea turtle	General Distribution		E/E	E	Rare													-	-	-	Mar-Dec*	Mar-Dec*
	Turtle	Leatherback sea turtle	General Distribution		E/E	E	Common													-	-	-	May-Jun	May-Jun
	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	S	F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
								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	S	F	Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
1844	Manatee	West Indian manatee	General Distribution		-/E	E	Rare													-	-	-	-


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	Jan-May	Feb-Apr
	American eel													Mar-Jun	Mar-Jun	Apr-Jun	Jan-May	Jan-Dec
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	Jan-May	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
	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
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleomose skate													-	-	-	-	Jun-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Jan-Dec
	Harvestfish													-	-	-	Jul-Nov	Mar-Nov
	Lined seahorse													May-Oct	-	-	-	May-Nov
	Spanish mackerel													-	-	-	-	Jan-Dec
														-	-	-	-	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											
		J	F	M	A	M	J	J	A	S	O	N	D
	Bivalve												
	Eastern oyster												
	Softshell clam												
	Stout razor clam												
	Cephalopod												
	Squid												
	Crab												
	Blue crab												
	Shrimp												
	Brown shrimp												
	Mantis shrimp												
	White shrimp												

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 (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	369.96	0.58
10B	Freshwater Marshes	375.17	0.59
10C	Swamps	2,196.80	3.43
10D	Scrub and Shrub Wetlands	193.33	0.30

ESI SHORELINE HABITAT TYPES

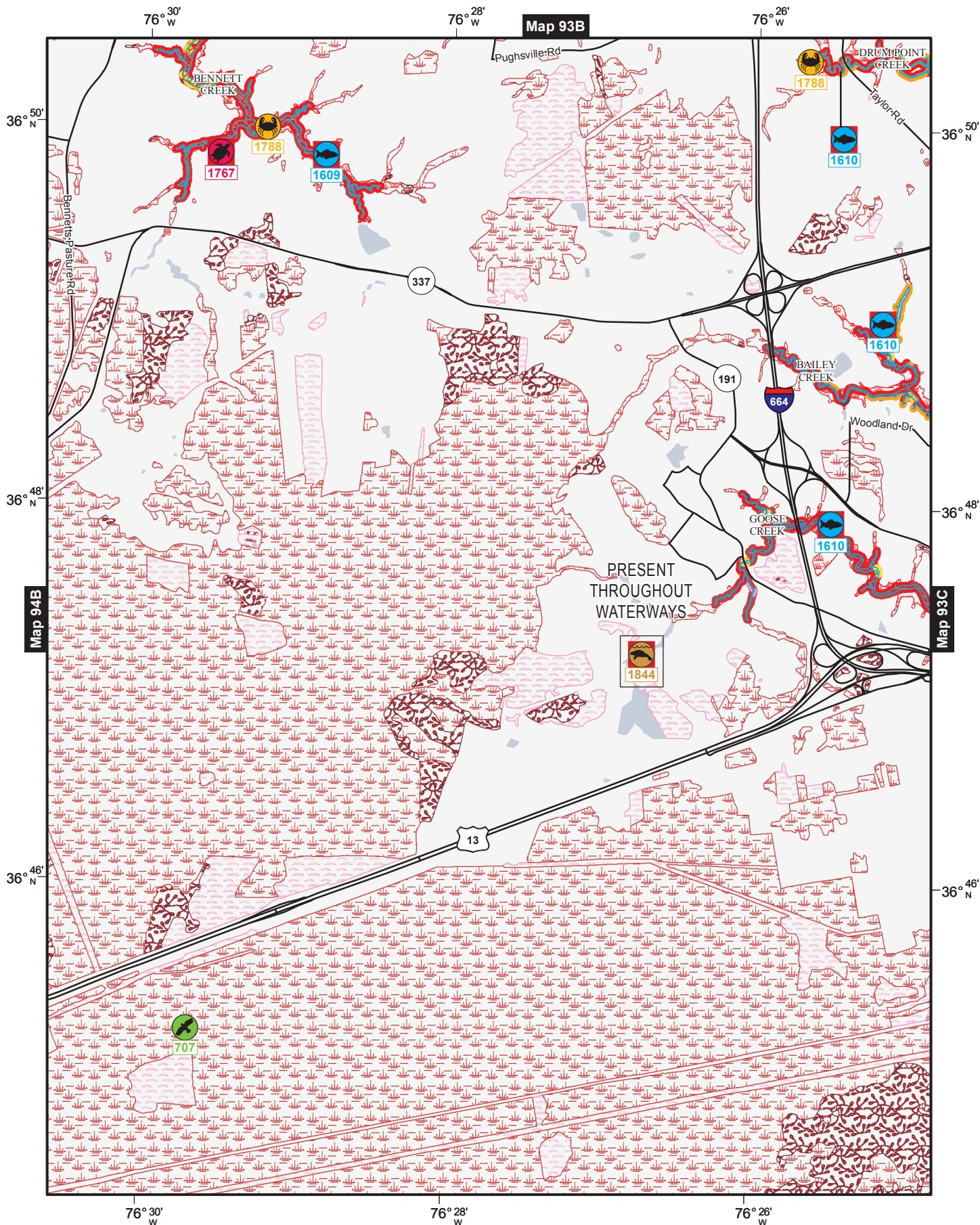
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	77,164.88	47.95	57%
10C	Swamps	7,737.38	4.81	6%
10D	Scrub and Shrub Wetlands	616.10	0.38	< 1%
9B	Vegetated Low Banks	24,146.67	15.00	18%
8B	Sheltered, Solid Man-Made Structures	8,177.76	5.08	6%
8C	Sheltered Riprap	17,900.56	11.12	13%
4	Coarse Grained Sand Beaches	508.82	0.32	< 1%

Total ESI Shoreline: 136,252.19
Total Shoreline: 107,596.35

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

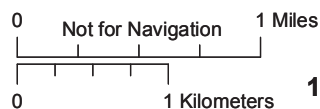




Map 93D Chesapeake South



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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Map 93D
Chesapeake South

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		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
707	Raptor	Bald eagle	Roosting			-													-	-	-

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				
1609	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-												-	-	Mar-May	Jan-Dec	-
1610	Diadromous	Alewife	Migration			-												-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Blueback herring	Migration			-												-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Nursery Area			-												-	-	Mar-May	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				
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

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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

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													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
	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
	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
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Clearnose skate													-	-	-	-	Jun-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Spanish mackerel													-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

Monthly Presence

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												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													May-Dec*	May-Jan*	-	Jan-Dec
	Softshell clam													Jun-Nov	-	Jan-Dec	Jan-Dec
	Stout razor clam													-	Apr-Dec	Apr-Dec	Apr-Dec
	Cephalopod													-	-	Jan-Dec	Jan-Dec
	Squid													-	-	Jan-Dec	Jan-Dec
	Crab													-	-	May-Oct	May-Oct
	Blue crab													-	-	Jan-Dec	Jan-Dec
	Shrimp													-	-	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													May-Aug	May-Aug	-	-
	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	245.35	0.38
10B	Freshwater Marshes	1,298.50	2.03
10C	Swamps	11,703.13	18.29
10D	Scrub and Shrub Wetlands	843.67	1.32

ESI SHORELINE HABITAT TYPES

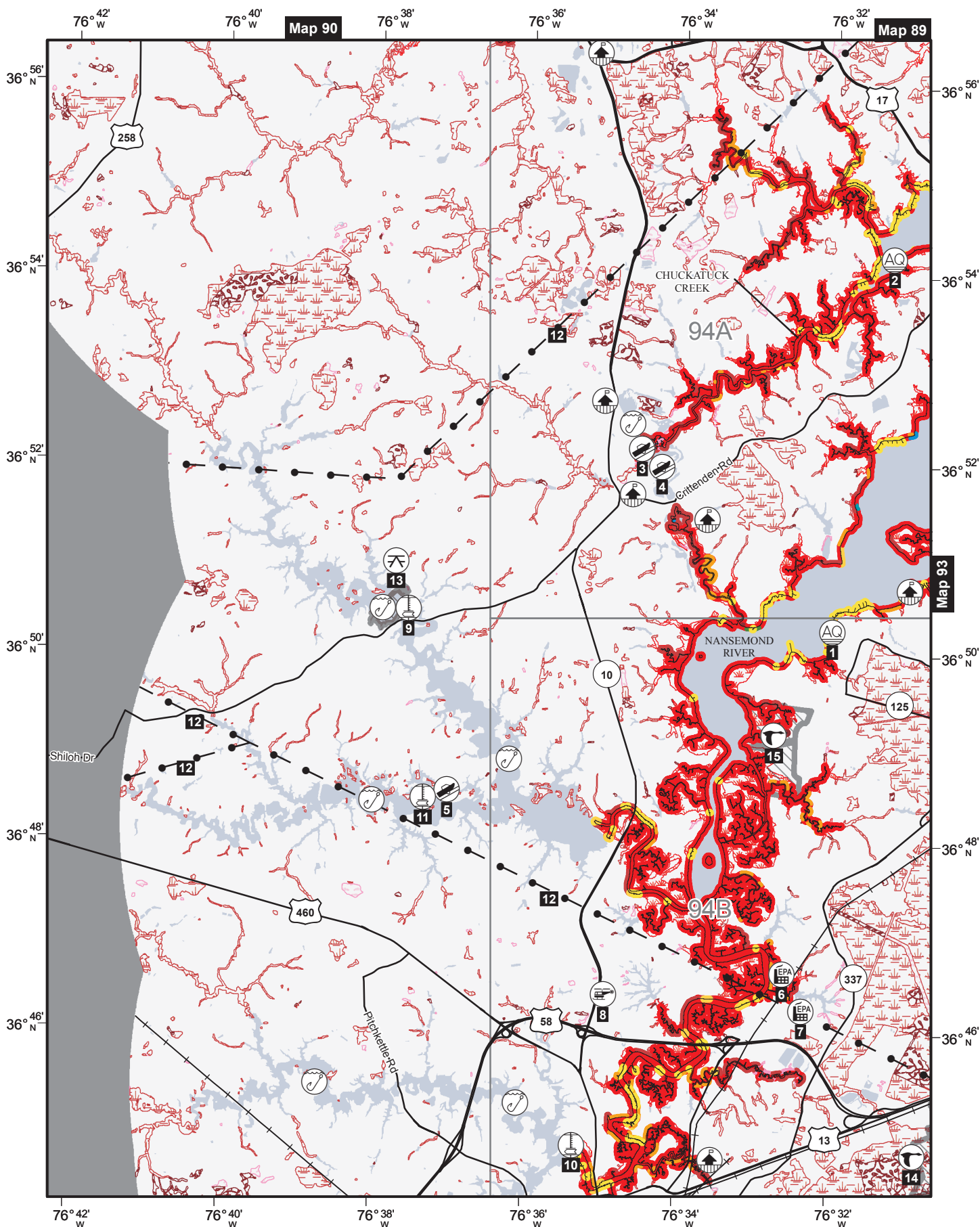
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	42,427.11	26.36	75%
10B	Freshwater Marshes	213.46	0.13	< 1%
10C	Swamps	9,308.35	5.78	16%
10D	Scrub and Shrub Wetlands	192.59	0.12	< 1%
9B	Vegetated Low Banks	3,704.50	2.30	7%
8B	Sheltered, Solid Man-Made Structures	326.04	0.20	1%
8C	Sheltered Riprap	451.88	0.28	1%

Total ESI Shoreline: 56,623.94
Total Shoreline: 43,418.49
Total ESI Shoreline: 35.18
Total Shoreline: 26.98

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 94
Chesapeake South



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 94
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
Map ID	Type	Name	Contact Phone
1	AQUACULTURE	OYSTER NON-COMM IAMS RF#011572	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
2	AQUACULTURE	OYSTER NON-COMM SMITH, KARLA M RF#98-1767	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
3	BOAT RAMP	BUTLER TRACT LAKE	LENE PENNINGTON, VDGIF 804-367-0058
4	BOAT RAMP	CRANE LAKE	LENE PENNINGTON, VDGIF 804-367-0058
5	BOAT RAMP	WESTERN BRANCH	LENE PENNINGTON, VDGIF 804-367-0058
6	EPA FACILITY	BASF CORPORATION	SITE PRODUCTION MANAGER 757-538-5266
7	EPA FACILITY	JMS FOODSERVICE, LLC - SUFFOLK	SQMS MANAGER 757-342-5236
8	HELIPORT	SENTARA OBICI HOSPITAL	
9	LOCK AND DAM	LAKE BURNT MILLS DAM	
10	LOCK AND DAM	LAKE MEAD DAM	
11	LOCK AND DAM	LAKE PRINCE DAM	

DISPLAYED ON MAP (LINES)			
Map ID	Type	Name	Contact Phone
12	PIPELINE	PIPELINE	

DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Contact Phone
13	PARK	BURNT MILLS LAKE PARK	CITY OF SUFFOLK
14	WILDLIFE REFUGE	GREAT DISMAL SWAMP NWR	UNITED STATES FISH AND WILDLIFE SERVICE 757-986-3705
15	WILDLIFE REFUGE	NANSEMOND NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE 757-986-3705

JURISDICTIONS

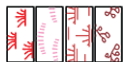
COUNTY: ISLE OF WIGHT COUNTY, SUFFOLK CITY
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, NORFOLK DISTRICT

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	4,254.41	6.65
10B	Freshwater Marshes	403.17	0.63
10C	Swamps	7,736.51	12.09
10D	Scrub and Shrub Wetlands	886.73	1.39



ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	365,659.64	227.21	90%
10B	Freshwater Marshes	1,041.14	0.65	< 1%
10C	Swamps	16,948.32	10.53	4%
10D	Scrub and Shrub Wetlands	77.03	0.05	< 1%
9B	Vegetated Low Banks	12,611.19	7.84	3%
8B	Sheltered, Solid Man-Made Structures	8,471.63	5.26	2%
8C	Sheltered Riprap	2,494.07	1.55	1%
6B	Riprap	282.91	0.18	< 1%
5	Mixed Sand and Gravel Beaches	114.58	0.07	< 1%
4	Coarse Grained Sand Beaches	235.45	0.15	< 1%

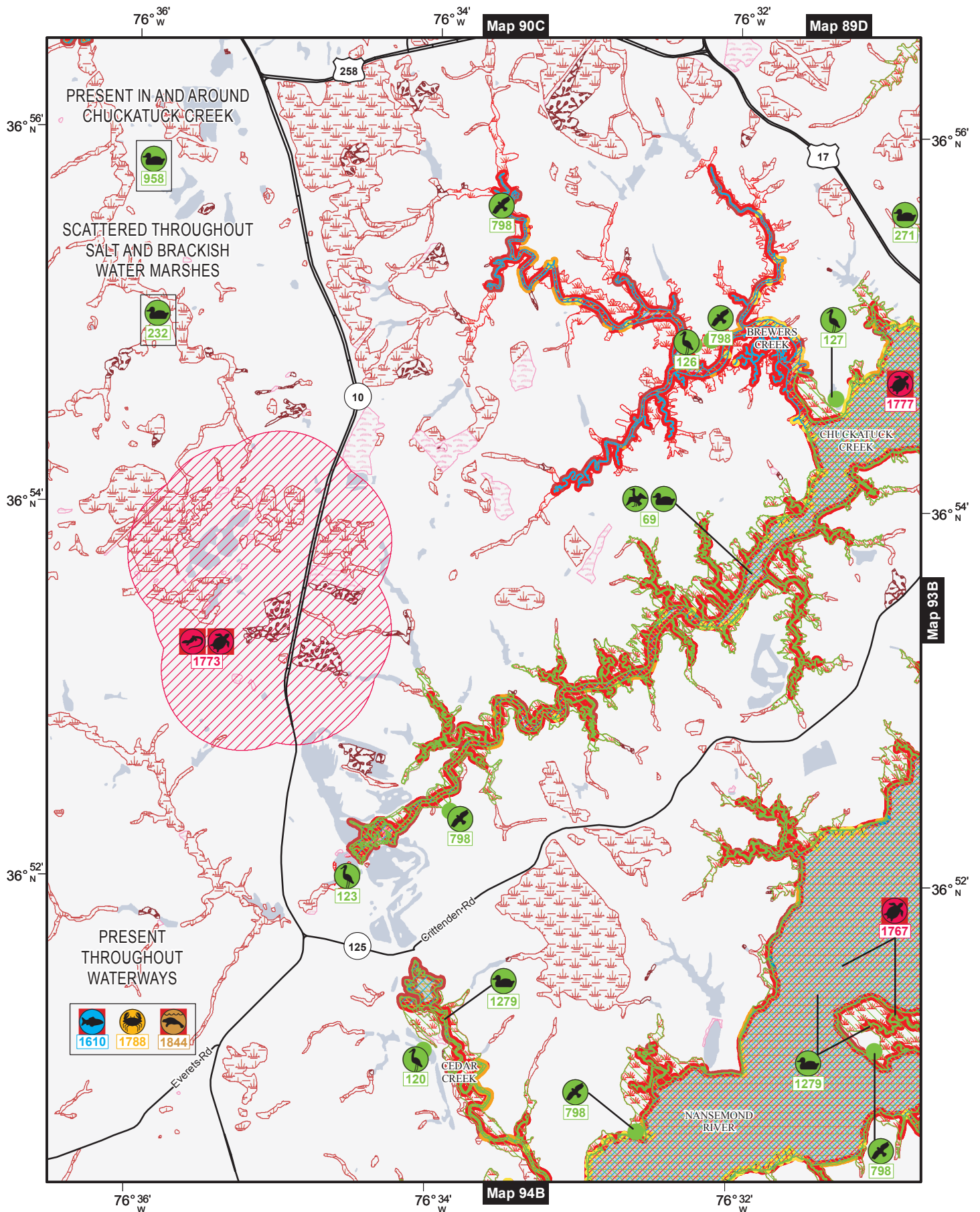


Total ESI Shoreline: 407,935.96 Total ESI Shoreline: 253.48
 Total Shoreline: 379,738.08 Total Shoreline: 235.96

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

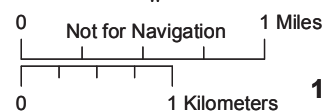




Map 94A Chesapeake South



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 94A
Chesapeake South

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)	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
69	Diving	Grebes	Wintering		Present													-	-	-	-	-
	Waterfowl	Bufflehead	Wintering		10S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering		100S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering		10S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering		100S													-	-	-	-	-
120	Wading	Great blue heron	Nesting		5 Nests													Feb-Jun	-	-	-	-
123	Wading	Great blue heron	Nesting		14 Nests													Feb-Jun	-	-	-	-
126	Wading	Great blue heron	Nesting		3 Nests													Feb-Jun	-	-	-	-
127	Wading	Great blue heron	Nesting		3 Nests													Feb-Jun	-	-	-	-
	Wading	Great egret	Nesting		1 Nest													Apr-Aug	-	-	-	-
232	Waterfowl	Canada goose	Nesting		Present													Mar-Aug	-	-	Jun-Jul	-
	Waterfowl	Mallard	Nesting		Present													Mar-Aug	-	-	Jul-Aug	-
271	Waterfowl	Canada goose	Nesting		Present													Mar-Aug	-	-	Jun-Jul	-
	Waterfowl	Canada goose	Wintering		1,000S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering		10S													-	-	-	-	-
	Waterfowl	Mallard	Nesting		Present													Mar-Aug	-	-	Jul-Aug	-
798	Raptor	Bald eagle	Nesting		1 Nest													Dec-Jun	-	-	-	-
958	Waterfowl	Canada goose	Wintering		1,000S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering		10S													-	-	-	-	-
1279	Waterfowl	Bufflehead	Wintering		100S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering		10S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering		100S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering		Present													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering		100S													-	-	-	-	-
	Waterfowl	Scaup	Wintering		10S													-	-	-	-	-
	Waterfowl	Sooters	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					
1610	Diadromous	Alewife	Migration		-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-/E	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Blueback herring	Migration		-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Nursery Area		-													-	-	Mar-May	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																
							T/T	T	T	T	T	T	T	T	T	T	T						T
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	-		
1773	Amphibian	Barking treefrog	Vulnerable Occurrence	E/T		-											-	-	-	-	Jan-Dec		
	Turtle	Chicken turtle	Vulnerable Occurrence	-/E		-											-	-	-	-	Jan-Dec		
1777	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	Leatherback sea turtle	General Distribution	E/E	E	Rare											-	-	-	Mar-Dec*	-		
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Common											-	-	-	May-Jun	May-Jun		
	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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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1788	Crab	Blue crab	Concentration Area																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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1844	Manatee	West Indian manatee	General Distribution			Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

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															
	Waterfowl	American black duck	Wintering			10S												-	-	-		
		Mallard	Wintering			10S												-	-	-		

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

<div></div>	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																-	-	-

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	Jan-Dec
		American eel													-	-	-	Jan-May	Jan-Dec
		Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
		Striped bass													-	-	-	Jan-Dec	Jan-Dec

Chesapeake South: Map 94A





FISH (continued)

[illegible]

REPTILES & AMPHIBIANS

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

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
 Bivalve	Eastern oyster	J	F	M	A	M	J	J	A	S	O	N	D	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	Apr-Dec	Apr-Dec
 Crab	Blue 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

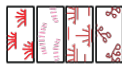
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
 Dolphin	Bottlenose dolphin	J	F	M	A	M	J	J	A	S	O	N	D	May-Aug	May-Aug	-	-

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	1,400.08	2.19
10B	Freshwater Marshes	210.89	0.33
10C	Swamps	2,171.77	3.39
10D	Scrub and Shrub Wetlands	230.14	0.36



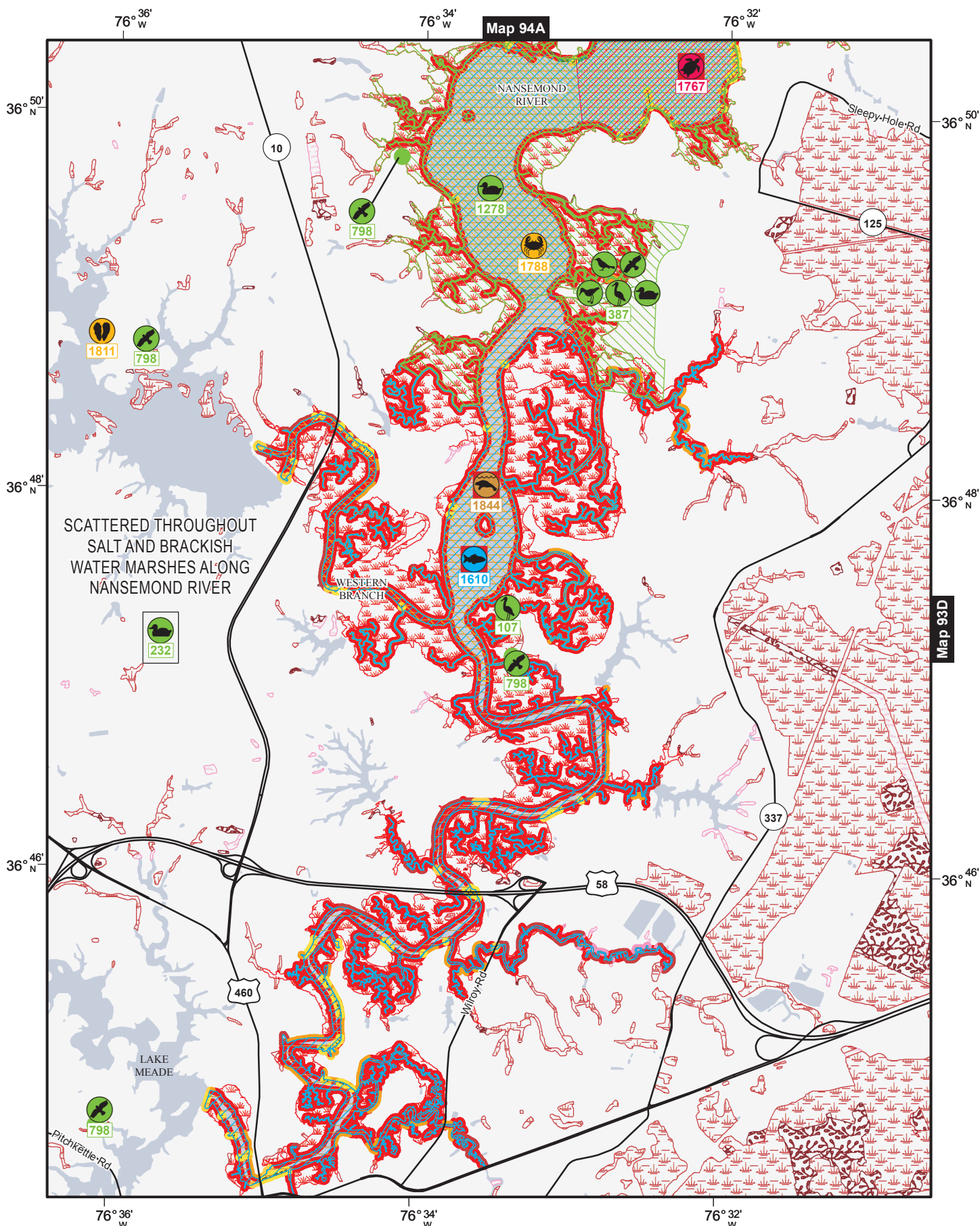
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	125,909.93	78.24	84%
10B	Freshwater Marshes	533.82	0.33	< 1%
10C	Swamps	11,079.34	6.88	7%
10D	Scrub and Shrub Wetlands	23.86	0.01	< 1%
9B	Vegetated Low Banks	5,620.96	3.49	4%
8B	Sheltered, Solid Man-Made Structures	4,383.31	2.72	3%
8C	Sheltered Riprap	1,207.67	0.75	1%
5	Mixed Sand and Gravel Beaches	114.58	0.07	< 1%
4	Coarse Grained Sand Beaches	235.45	0.15	< 1%
Total ESI Shoreline:		149,108.91	92.65	
Total Shoreline:		134,154.29	83.36	

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 94B
Chesapeake South

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				
107	Wading	Great blue heron	Nesting		22 Nests													Feb-Jun	-	-	-
232	Waterfowl	Canada goose	Nesting		Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting		Present													Mar-Aug	-	-	Jul-Aug
387	Passerine	Saltmarsh sharp-tailed sparrow	Nesting		-													May-Aug	-	-	-
	Passerine	Seaside sparrow	Nesting		-													May-Jul	-	-	-
	Raptor	Osprey	Nesting		-													Mar-Aug	-	-	-
	Shorebird	Shorebirds	Wintering		-													-	May-Jun	Aug-Oct	-
	Wading	Clapper rail	Nesting		-													Apr-Sep	-	-	-
	Waterfowl	American black duck	Nesting		Occasional													Apr-Aug	-	-	-
	Waterfowl	Waterfowl	Wintering		-													-	-	-	-
798	Raptor	Bald eagle	Nesting		1 Nest													Dec-Jun	-	-	-
1278	Waterfowl	American black duck	Wintering		10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering		100S													-	-	-	-
	Waterfowl	Canada goose	Wintering		10S													-	-	-	-
	Waterfowl	Canvasback	Wintering		100S													-	-	-	-
	Waterfowl	Mallard	Wintering		10S													-	-	-	-
	Waterfowl	Mergansers	Wintering		Present													-	-	-	-
	Waterfowl	Ruddy duck	Wintering		100S													-	-	-	-
	Waterfowl	Scaup	Wintering		10S													-	-	-	-
	Waterfowl	Sooters	Wintering		Present													-	-	-	-

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	D					
1610	Diadromous	Alewife	Migration		-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-/E E	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Blueback herring	Migration		-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Nursery Area		-													-	-	Mar-May	Jan-Dec	-

REPTILES & AMPHIBIANS

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

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
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	Jun-Oct	Jun-Oct
1811	Bivalve	Eastern floater	Vulnerable Occurrence			-													-	-	Jan-Dec	Jan-Dec
	Bivalve	Paper pondshell	Vulnerable Occurrence			-													-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

MARINE MAMMALS




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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1844	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													-	-	-	-
	Raptor													-	Mar-May	Aug-Nov	-
	D. crested cormorant													-	-	-	-
	Shorebird													-	May	Jul	-
	Bald eagle													-	-	-	-
	Wading													-	-	-	-
	Willet													-	-	-	-
	Virginia rail													-	-	-	-

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													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery													-	-	Apr-Dec	Jan-Dec	May-Oct
	Striped bass													-	-	-	-	Jan-Jun
	Atlantic croaker													-	-	-	-	Jan-Oct
	Atlantic herring													-	-	-	-	Jan-Dec
	Atlantic menhaden													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black drum													-	-	-	Apr-Nov	Apr-Nov
	Black sea bass													-	-	-	May-Oct	May-Oct
	Bluefish													-	-	-	-	Apr-Nov
	Kingfishes													-	-	-	-	Mar-Oct
	Northern puffer													-	-	-	-	Apr-Nov
	Pigfish													-	-	-	-	May-Nov
	Red drum													-	-	-	-	Apr-Nov
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	-	Nov-Apr
	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
	Estuarine Resident													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	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					
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Sep
	Atlantic spadefish													-	-	-	-	Jun-Dec
	Cleamose skate													-	-	-	-	Jun-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	-	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Butterfish													-	-	-	-	Jan-Dec
	Harvestfish													-	-	-	Jul-Nov	Mar-Nov
	Lined seahorse													-	-	-	-	May-Nov
	Spanish mackerel													May-Oct	-	-	-	Jan-Dec
														-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

Subelement	Species	Monthly Presence												Nest	Hatch	Interest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diamondback terrapin													-	-	-	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
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

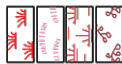
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-

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	2,843.47	4.44
10B	Freshwater Marshes	97.74	0.15
10C	Swamps	2,931.58	4.58
10D	Scrub and Shrub Wetlands	340.63	0.53



ESI SHORELINE HABITAT TYPES

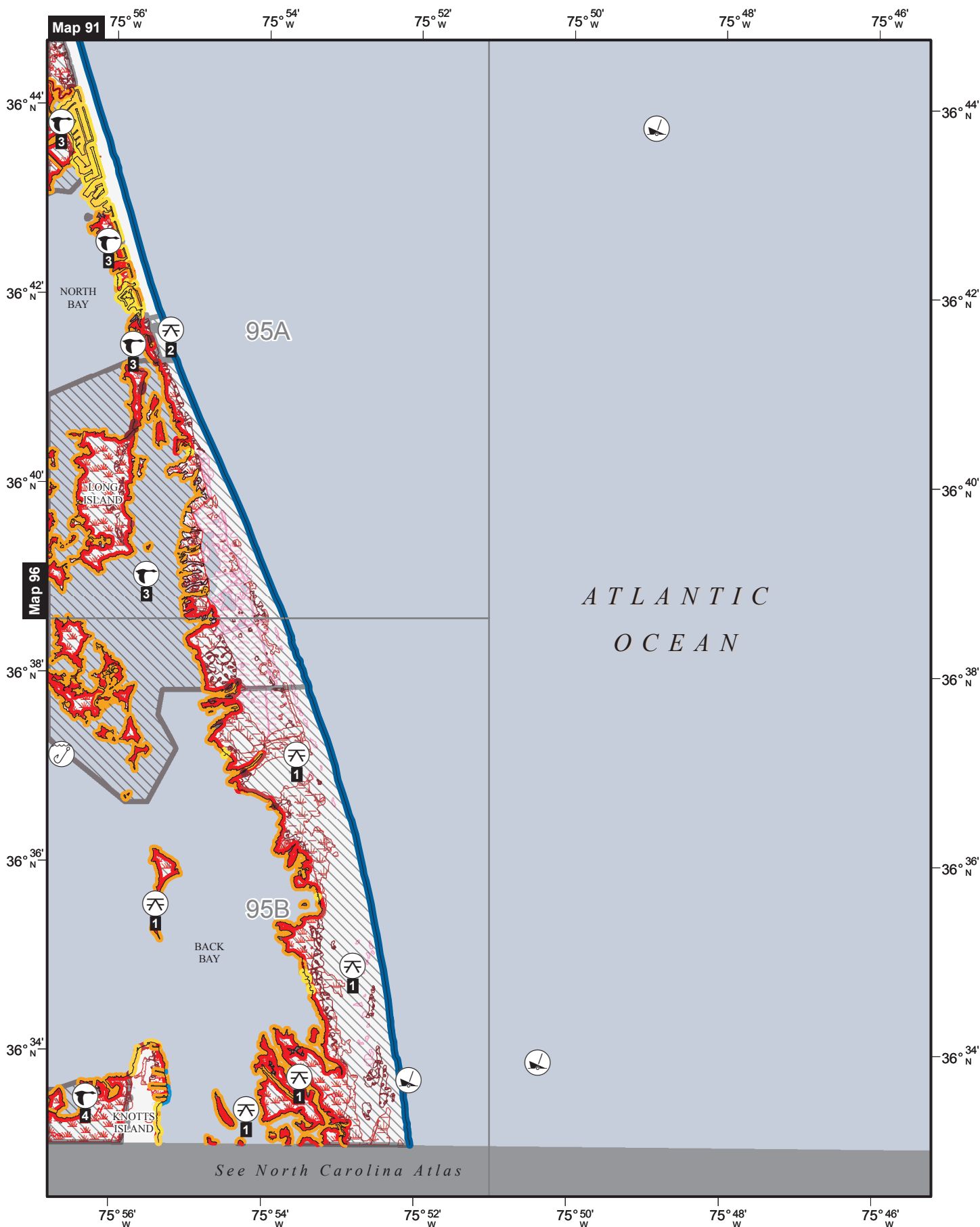
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	239,749.71	148.97	93%
10B	Freshwater Marshes	507.32	0.32	< 1%
10C	Swamps	5,868.98	3.65	2%
10D	Scrub and Shrub Wetlands	53.17	0.03	< 1%
9B	Vegetated Low Banks	6,990.23	4.34	3%
8B	Sheltered, Solid Man-Made Structures	4,088.32	2.54	2%
8C	Sheltered Riprap	1,286.41	0.80	< 1%
6B	Riprap	282.91	0.18	< 1%

Total ESI Shoreline: 258,827.05 Total ESI Shoreline: 160.83
Total Shoreline: 245,583.79 Total Shoreline: 152.60

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

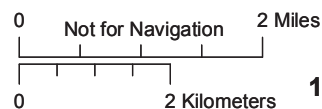




Map 95
Chesapeake South



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



1:100,000



Map 95
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
1	PARK	FALSE CAPE STATE PARK	VA DEPT OF CONSERVATION AND RECREATION	
2	PARK	LITTLE ISLAND PARK	CITY OF VIRGINIA BEACH	
3	WILDLIFE REFUGE	BACK BAY NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE	757-301-7329
4	WILDLIFE REFUGE	MACKAY ISLAND NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE	252-429-3100

JURISDICTIONS

COUNTY: VIRGINIA BEACH CITY
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, 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	2,901.77	4.53
10B	Freshwater Marshes	688.61	1.08
10C	Swamps	837.81	1.31
10D	Scrub and Shrub Wetlands	502.01	0.78
9A	Sheltered Tidal Flats	130.41	0.20
7	Exposed Tidal Flats	0.19	0.00

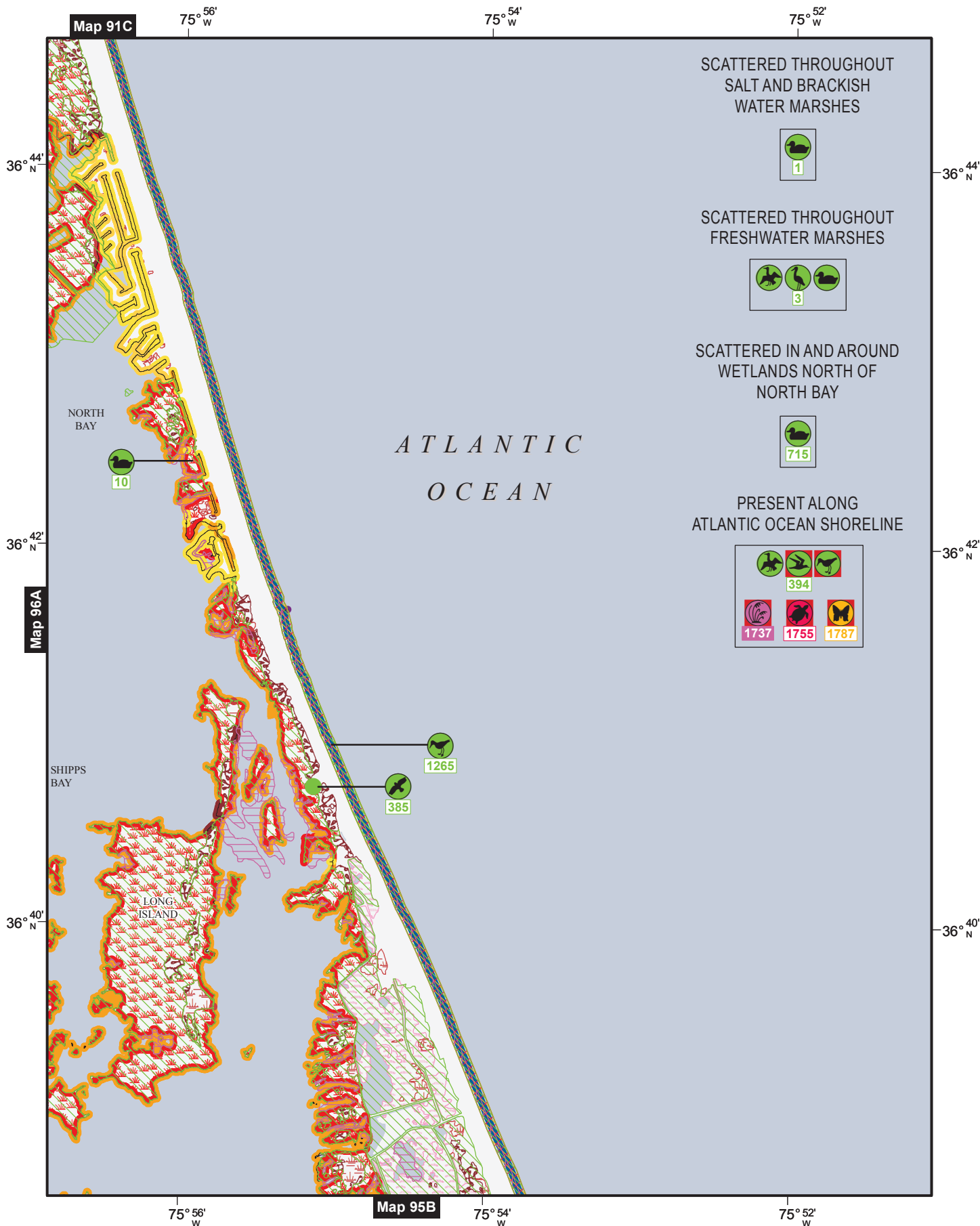
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	157,764.35	98.03	43%
10C	Swamps	2,257.87	1.40	1%
10D	Scrub and Shrub Wetlands	1,417.51	0.88	< 1%
9A	Sheltered Tidal Flats	157,106.95	97.62	43%
9B	Vegetated Low Banks	2,790.53	1.73	1%
8B	Sheltered, Solid Man-Made Structures	16,081.53	9.99	4%
8C	Sheltered Riprap	4,053.53	2.52	1%
7	Exposed Tidal Flats	15.88	0.01	< 1%
4	Coarse Grained Sand Beaches	472.95	0.29	< 1%
3A	Fine to Medium Grained Sand Beaches	22,731.69	14.12	6%
1B	Exposed, Solid Man-Made Structures	55.71	0.03	< 1%
Total ESI Shoreline:		364,748.49	Total ESI Shoreline:	226.64
		Total Shoreline:	Total Shoreline:	126.96

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



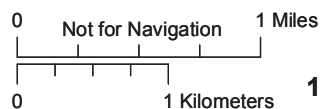


Map 95A

Chesapeake South



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 95A
Chesapeake South

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				-									

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence											
								J	F	M	A	M	J	J	A	S	N	D	Nest
1	Waterfowl	American black duck	Nesting				Present												Apr-Jul
	Waterfowl	Canada goose	Nesting				Present												Mar-Aug
	Waterfowl	Mallard	Nesting				Present												Mar-Aug
3	Diving	D. crested cormorant	Concentration Area				High												-
	Wading	King rail	Nesting				Low												Apr-Jul
	Waterfowl	American black duck	Nesting				Present												Apr-Jul
	Waterfowl	American coot	Concentration Area				Very High												-
	Waterfowl	Canada goose	Nesting				Present												Mar-Aug
	Waterfowl	Dabbling ducks	Wintering				1,000S												-
	Waterfowl	Diving ducks	Wintering				100S												-
	Waterfowl	Geese	Wintering				1,000S												-
	Waterfowl	Mallard	Nesting				Present												Mar-Aug
	Waterfowl	Wood duck	Nesting				Present												Apr-Jul
	Waterfowl	American black duck	Nesting				Present												Apr-Jul
	Waterfowl	American black duck	Wintering				100S												-
	Waterfowl	American wigeon	Wintering				100S												-
	Waterfowl	Blue-winged teal	Migration				100S												-
	Waterfowl	Canada goose	Nesting				Present												Mar-Aug
	Waterfowl	Canvasback	Wintering				10S												-
	Waterfowl	Gadwall	Wintering				100S												-
	Waterfowl	Green-winged teal	Wintering				100S												-
	Waterfowl	Mallard	Nesting				Present												Mar-Aug
	Waterfowl	Mallard	Wintering				100S												-
	Waterfowl	Mergansers	Wintering				Present												-
	Waterfowl	Northern shoveler	Wintering				Present												-
	Waterfowl	Ruddy duck	Wintering				10S												-
	Waterfowl	Snow goose	Wintering				10S												-
	Waterfowl	Tundra swan	Wintering				100S												-
	Raptor	Osprey	Nesting				-												Mar-Aug
	Diving	Brown pelican	Concentration Area				High												-
	Diving	D. crested cormorant	Migration				Very High												-
	Gull/Tern	Gull-billed tern	General Distribution				Low												-
																			-

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			
	Gull/Tern	Gulls	Concentration Area			High													-	-	-
	Gull/Tern	Terns	Concentration Area			High													-	-	-
	Shorebird	Black-bellied plover	Migration			Moderate													-	May-Jun	Sep-Dec
	Shorebird	Dunlin	Migration			High													-	Apr-May	Oct-Nov
	Shorebird	Greater yellowlegs	Migration			Moderate													-	Mar-Jun	Jul-Nov
	Shorebird	Least sandpiper	Migration			High													-	Mar-Apr	Jul-Nov
	Shorebird	Piping plover	General Distribution	E/T	T	Low													-	Mar-Jun	Jul-Oct
	Shorebird	Red knot	Migration	T/T	T	Moderate													-	Apr-Jun	Jul-Oct
	Shorebird	Ruddy turnstone	Migration			Moderate													-	May	Aug
	Shorebird	Sanderling	Migration			Very High													-	May-Jun	Aug-Oct
	Shorebird	Semipalmated plover	Migration			High													-	Apr-Jun	Jul-Nov
	Shorebird	Semipalmated sandpiper	Migration			High													-	Apr-Jun	Jul-Oct
	Shorebird	Whimbrel	Migration			Moderate													-	Apr-May	Jul-Sep
	Shorebird	Willet	Migration			High													-	May	Jul
715	Waterfowl	American black duck	Wintering			100S													-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct
	Waterfowl	Canvasback	Wintering			10S													-	-	-
	Waterfowl	Gadwall	Wintering			100S													-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-
	Waterfowl	Mergansers	Wintering			Present													-	-	-
	Waterfowl	Northern shoveler	Wintering			Present													-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-
	Waterfowl	Snow goose	Wintering			10S													-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-
1265	Shorebird	Shorebirds	Migration			High Diversity													-	May-Jun	Aug-Oct

HABITATS & RARE PLANTS

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				
1737	Wetland	Seabeach amaranth	Vulnerable Occurrence	E/T	T	Very Rare													-	-	-	-







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				
1755	Turtle	Green sea turtle	Vulnerable Occurrence	T/T	T	1 Nest													Jun-Aug	-	-	Jun-Aug
	Turtle	K. ridley sea turtle	Nesting	E/E	E	0-1 Nest													Jun-Aug	-	-	Jul-Sep
	Turtle	Loggerhead sea turtle	Nesting	T/T	T	0-8 Nests													May-Aug	Jun-Oct	-	Jun-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				
1787	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	Potential													Jun-Aug	Jun-Aug	Jan-Dec	-

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				
	Alcids	Wintering			Present													-	-	-	-
	Alcids	Wintering			10S													-	-	-	-
	Common loon	Wintering			1,000S													-	-	-	-
	Common loon	Wintering			100S													-	-	-	-
	Common loon	Wintering			10S													-	-	-	-
	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			100S													-	-	-	-
	Grebes	Wintering			Present													-	-	-	-
	Grebes	Wintering			10S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Red-throated loon	Wintering			1,000S													-	-	-	-
	Northern gannet	Wintering			1,000S													-	-	-	-
	Northern harrier	Wintering			High													-	-	-	-
	Lesser yellowlegs	Migration			-													-	Mar-May	Jul-Sep	-
	Short-billed dowitcher	Migration			-													-	Mar-Jun	Jul-Oct	-
	King rail	Nesting			-													Apr-Jul	-	-	-
	American black duck	Wintering			1,000S													-	-	-	-
	American coot	Wintering			1,000S													-	-	-	-
	American wigeon	Wintering			1,000S													-	-	-	-
	Blue-winged teal	Migration			1,000S													-	Feb-Apr	Aug-Oct	-
	Bufflehead	Wintering			10S													-	-	-	-
	Canada goose	Wintering			100S													-	-	-	-
	Canvasback	Wintering			100S													-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-
	Green-winged teal	Wintering			1,000S													-	-	-	-
	Long-tailed duck	Wintering			10S													-	-	-	-
	Long-tailed duck	Wintering			Present													-	-	-	-
	Mallard	Wintering			1,000S													-	-	-	-
	Mergansers	Wintering			10S													-	-	-	-
	Northern pintail	Wintering			100S													-	-	-	-
	Northern shoveler	Wintering			100S													-	-	-	-
	Red-breasted merganser	Wintering			Present													-	-	-	-
	Red-breasted merganser	Wintering			100S													-	-	-	-
	Redhead	Wintering			100S													-	-	-	-
	Ring-necked duck	Wintering			100S													-	-	-	-
	Ruddy duck	Wintering			100S													-	-	-	-
	Scaup	Wintering			100S													-	-	-	-
	Scooters	Wintering			100S													-	-	-	-
	Scooters	Wintering			10,000S													-	-	-	-
	Snow goose	Wintering			1,000S													-	-	-	-
	Tundra swan	Wintering			1,000S													-	-	-	-

FISH

[illegible]

REPTILES & AMPHIBIANS

Subelement	Species	Mapping Qualifier	MDVA		Monthly Presence												Nest	Hatch	Interest	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													-	-	-	Jul-Oct	-
	Green sea turtle	General Distribution	T/T	T													-	-	-	May-Dec*	-
	K. ridley sea turtle	General Distribution	E/E	E													-	-	-	Nov-Dec	-
	K. ridley sea turtle	General Distribution	E/E	E													-	-	-	Apr-Oct	-
	Leatherback sea turtle	General Distribution	E/E	E													-	-	-	May-Jun	May-Jun
	Leatherback sea turtle	General Distribution	E/E	E													-	-	-	Mar-Dec*	Mar-Dec*
	Loggerhead sea turtle	General Distribution	T/T	T													-	-	-	Nov-Dec	Nov-Dec
	Loggerhead sea turtle	General Distribution	T/T	T													-	-	-	Apr-Oct	Apr-Oct

INVERTEBRATES

[illegible]

MARINE MAMMALS

[illegible]






ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS



[illegible]

Chesapeake South: Map 95A

BIRDS (continued)

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Saltmarsh sharp-tailed sparrow													-	-	-	-
	Seaside sparrow													-	-	-	-
	Shearwaters													-	-	-	-
	Storm-petrels													-	-	-	-
	Bald eagle													-	-	-	-
	Bald eagle													Dec-Jun	-	-	-
	Osprey													-	-	-	-
	Osprey													Mar-Aug	-	-	-
	Phalaropes													-	-	-	-
	Semipalmated sandpiper													-	Apr-Jun	Jul-Oct	-
	Shorebirds													-	-	-	-
	Great egret													-	-	-	-
	Least bittern													-	-	-	-
	Secretive marsh birds													-	-	-	-
	Snowy egret													-	-	-	-
	Wading birds													-	-	-	-
	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													-	-	-	Apr-Jun	Apr-Jun
	Alewife													-	-	-	Aug-Nov	Feb-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	Aug-Nov	Feb-Jul
	American shad													-	-	-	-	Apr-Jun
	Blueback herring													-	-	-	Aug-Nov	Feb-Jul
	Blueback herring													-	-	-	Apr-Jun	Feb-Jul
	Gizzard shad													Mar-Jun	-	Apr-Jun	Jan-Dec	Jan-Dec
	Hickory shad													-	-	-	Jun-Oct	Feb-Jun
	Striped bass													-	-	-	-	Jan-Dec
	Atl. sharpnose shark													-	-	-	-	May-Oct
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic croaker													-	-	-	Aug-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	May-Oct
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Black drum													-	-	-	-	Apr-Oct
	Black sea bass													Jun-Oct	-	-	Apr-Oct	Apr-Oct
	Bluefish													-	-	-	May-Nov	Apr-Nov
	Kingfishes													Apr-Sep	-	-	-	Apr-Oct
	Mullet													Jul-Oct	-	-	Jan-Dec	Jan-Dec
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	-	Jan-Dec
	Pigfish													-	-	-	-	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					
Estuarine Resident	Red drum													-	-	-	Jan-Dec	Jan-Dec
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Southern flounder													-	-	-	Jan-Dec	-
	Spot													-	-	-	Jan-Dec	-
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Jan-Dec	-
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
Fish	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Killifish													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Great hammerhead													-	-	-	-	May-Oct
	Black crappie													Mar-Jul	-	-	Jan-Dec	-
Freshwater	Blue catfish													May-Jul	-	-	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Chain pickerel													Feb-Apr	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Eastern creek chubsucker													Mar-May	-	-	Jan-Dec	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Longnose gar													May-Jun	-	-	Jan-Dec	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
Marine Benthic	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleomose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	-	Mar-Oct
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Tautog													Apr-Aug	-	-	-	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					
	Marine Pelagic																	
	Atlantic mackerel																	Mar-Apr
	Atlantic needlefish																Jan-Dec	-
	Blacktip shark																	May-Oct
	Butterfish																Jul-Nov	Mar-Nov
	Dusky shark																	May-Oct
	Great white shark																	Jan-Dec
	Sand tiger shark																	May-Oct
	Sandbar shark																	May-Oct
	Scalloped hammerhead																May-Oct	May-Oct
	Spanish mackerel																	May-Sep
	Spinner shark																	May-Oct
	Spiny dogfish																Nov-May	Nov-May
	Thresher shark																	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																	Jan-Dec
	Atlantic surfclam																	Jan-Dec
	Squid																	Jan-Dec
	Cephalopod																	Jan-Dec
	Blue crab																	Jan-Dec
	Blue crab																	Jan-Dec
	Hermit crab																	Jan-Dec
	Horseshoe crab																	Jan-Dec
	Lady crab																	Jan-Dec
	Spider crabs																	Jan-Dec
	Channeled whelk																	Jan-Dec
	Gastropod																	Jan-Dec
	Knobbed whelk																	Jan-Dec
	Brown shrimp																	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																-
	Harbor porpoise																-
	Pinniped																-
	Short-beaked common dolphin																-
	Gray seal																-
	Harbor seal																-

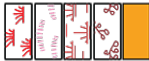
TERRESTRIAL MAMMALS

Subelement	Species	Monthly Presence											
		J	F	M	A	M	J	J	A	S	O	N	D
	Small Mammal												
	Northern river otter												

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	1,186.80	1.85
10B	Freshwater Marshes	249.10	0.39
10C	Swamps	91.40	0.14
10D	Scrub and Shrub Wetlands	182.67	0.29
9A	Sheltered Tidal Flats	23.83	0.04



ESI SHORELINE HABITAT TYPES

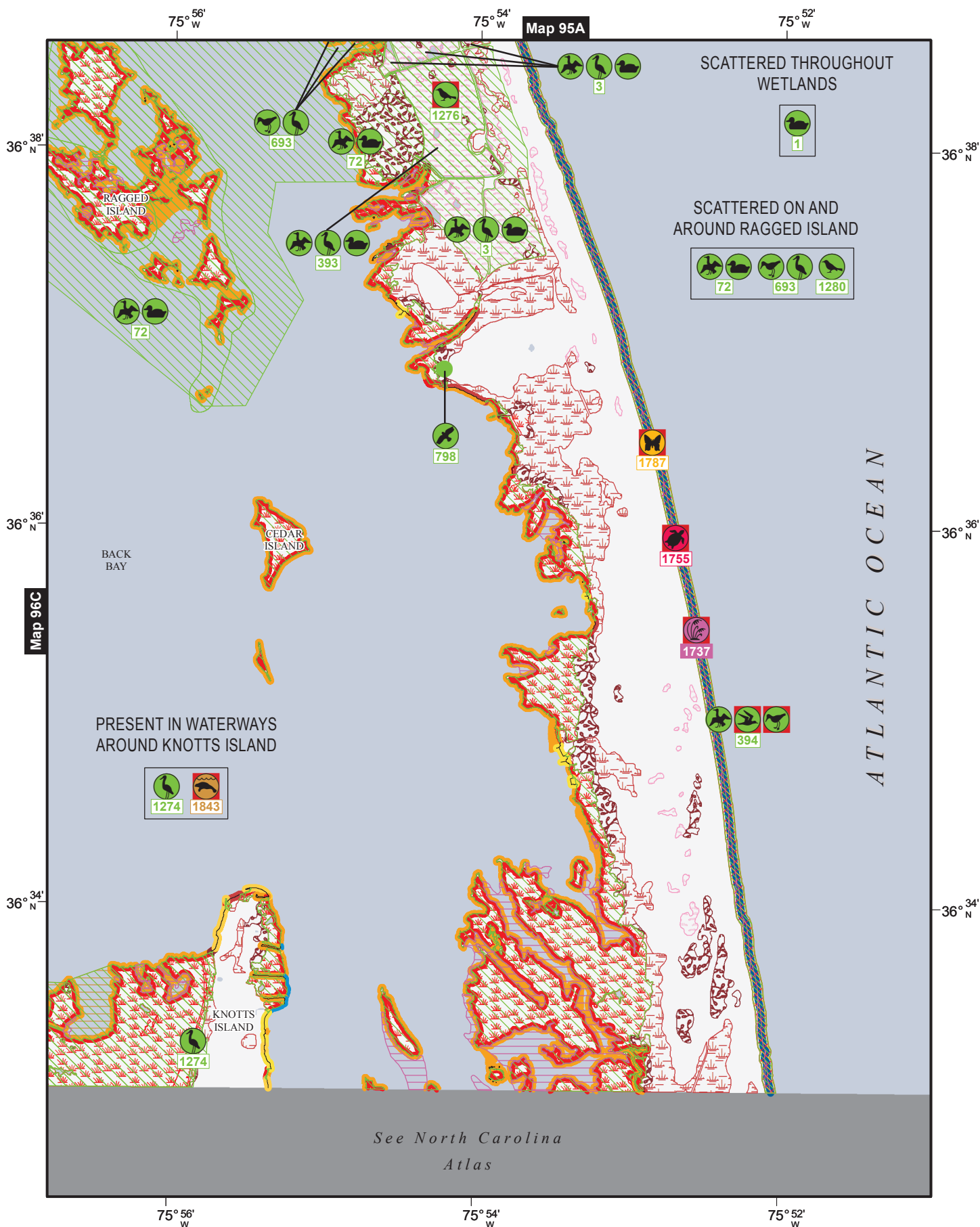
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	67,112.50	41.70	40%
10C	Swamps	875.02	0.54	1%
10D	Scrub and Shrub Wetlands	1,119.86	0.70	1%
9A	Sheltered Tidal Flats	65,981.27	41.00	40%
9B	Vegetated Low Banks	1,359.36	0.84	1%
8B	Sheltered, Solid Man-Made Structures	14,759.12	9.17	9%
8C	Sheltered Riprap	2,976.99	1.85	2%
3A	Fine to Medium Grained Sand Beaches	12,036.81	7.48	7%
1B	Exposed, Solid Man-Made Structures	55.71	0.03	< 1%

Total ESI Shoreline: 166,276.64 Total ESI Shoreline: 103.32
 Total Shoreline: 98,150.41 Total Shoreline: 60.99

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 95B
Chesapeake South

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			-												

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				
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
3	Diving	D. crested cormorant	Concentration Area			High											-	-	-	-
	Wading	King rail	Nesting			Low											Apr-Jul	-	-	-
	Waterfowl	American black duck	Nesting			Present											Apr-Jul	-	-	-
	Waterfowl	American coot	Concentration Area			Very High											-	-	-	-
	Waterfowl	Canada goose	Nesting			Present											Mar-Aug	-	-	Jun-Jul
	Waterfowl	Dabbling ducks	Wintering			1,000S											-	-	-	-
	Waterfowl	Diving ducks	Wintering			100S											-	-	-	-
	Waterfowl	Geese	Wintering			1,000S											-	-	-	-
	Waterfowl	Mallard	Nesting			Present											Mar-Aug	-	-	Jul-Aug
72	Waterfowl	Wood duck	Nesting			Present											Apr-Jul	-	-	Jul-Aug
	Diving	Common loon	Wintering			10S											-	-	-	-
	Diving	Grebes	Wintering			Present											-	-	-	-
	Waterfowl	American black duck	Wintering			1,000S											-	-	-	-
	Waterfowl	American coot	Wintering			1,000S											-	-	-	-
	Waterfowl	American wigeon	Wintering			1,000S											-	-	-	-
	Waterfowl	Blue-winged teal	Migration			1,000S											-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canvasback	Wintering			100S											-	-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S											-	-	-	-
	Waterfowl	Mallard	Wintering			1,000S											-	-	-	-
	Waterfowl	Northern pintail	Wintering			100S											-	-	-	-
	Waterfowl	Northern shoveler	Wintering			100S											-	-	-	-
393	Waterfowl	Redhead	Wintering			100S											-	-	-	-
	Diving	D. crested cormorant	Concentration Area			High											-	-	-	-
	Wading	King rail	Nesting			Low											Apr-Jul	-	-	-
	Waterfowl	American coot	Concentration Area			Very High											-	-	-	-
	Waterfowl	Dabbling ducks	Wintering			1,000S											-	-	-	-
	Waterfowl	Diving ducks	Wintering			100S											-	-	-	-
	Waterfowl	Geese	Wintering			1,000S											-	-	-	-
	Waterfowl	Wood duck	Nesting			Present											Apr-Jul	-	-	Jul-Aug

BIRDS (continued)

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				
394	Diving	Brown pelican	Concentration Area		High													-	-	-	-
	Diving	D. crested cormorant	Migration		Very High													-	Mar-May	Aug-Nov	-
	Gull/Tern	Gull-billed tern	General Distribution	E/T	Low													-	Apr-Jun	Jul-Sep	-
	Gull/Tern	Gulls	Concentration Area		High													-	-	-	-
	Gull/Tern	Terns	Concentration Area		High													-	-	-	-
	Shorebird	Black-bellied plover	Migration		Moderate													-	May-Jun	Sep-Dec	-
	Shorebird	Dunlin	Migration		High													-	Apr-May	Oct-Nov	-
	Shorebird	Greater yellowlegs	Migration		Moderate													-	Mar-Jun	Jul-Nov	-
	Shorebird	Least sandpiper	Migration		High													-	Mar-Apr	Jul-Nov	-
	Shorebird	Piping plover	General Distribution	E/T T	Low													-	Mar-Jun	Jul-Oct	-
	Shorebird	Red knot	Migration	T/T T	Moderate													-	Apr-Jun	Jul-Oct	-
	Shorebird	Ruddy turnstone	Migration		Moderate													-	May	Aug	-
	Shorebird	Sanderling	Migration		Very High													-	May-Jun	Aug-Oct	-
	Shorebird	Semipalmated plover	Migration		High													-	Apr-Jun	Jul-Nov	-
	Shorebird	Semipalmated sandpiper	Migration		High													-	Apr-Jun	Jul-Oct	-
	Shorebird	Whimbrel	Migration		Moderate													-	Apr-May	Jul-Sep	-
	Shorebird	Willet	Migration		High													-	May	Jul	-
	Shorebird	Lesser yellowlegs	Migration		-													-	Mar-May	Jul-Sep	-
	Shorebird	Short-billed dowitcher	Migration		-													-	Mar-Jun	Jul-Oct	-
	Wading	King rail	Nesting		-													-	Apr-Jul	-	-
798	Raptor	Bald eagle	Nesting		1 Nest													-	Dec-Jun	-	-
1274	Wading	King rail	Nesting		-													-	May-Jun	-	-
1276	Passerine	Le Conte's sparrow	Wintering		-													-	-	Sep-Feb	-
	Passerine	Nelson's sharp-tailed sparrow	Wintering		-													-	Sep-Jun	-	-
	Passerine	Savannah sparrow	Wintering		-													-	Sep-May	-	-
	Passerine	Sedge wren	Wintering	E/-	-													-	-	-	-
	Passerine	Swamp sparrow	Wintering		-													-	Oct-May	-	-
1280	Passerine	Purple martin	Roosting		10,000 Indivs													-	-	-	-

HABITATS & RARE PLANTS

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
1737	Wetland	Seabeach amaranth	Vulnerable Occurrence	E/T	Very Rare												

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
1755	Turtle	Green sea turtle	Vulnerable Occurrence	T/T	1 Nest													Jun-Aug	-	-	-	Jun-Aug
	Turtle	K. ridley sea turtle	Nesting	E/E	0-1 Nest													Jun-Aug	-	-	Jul-Sep	Jun-Aug
	Turtle	Loggerhead sea turtle	Nesting	T/T	0-8 Nests													May-Aug	Jun-Oct	-	Jun-Oct	May-Aug

INVERTEBRATES


Map ID	Subelement	Species	Mapping Qualifier	MD/VIA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	E/T	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Jun-Aug	Jun-Aug	Jun-Aug
1787	Insect	NE beach tiger beetle	Vulnerable Occurrence				Potential															

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VIA		Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

	Subelement	Species	Mapping Qualifier	MD/VIA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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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	Migration			-													-	-	-	Sep-Dec
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	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				
	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	-
	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	May-Jun	May-Jun
	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	Mar-Dec*	Mar-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				
	Monarch butterfly	Migration			-													-	-	-	Sep-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			
	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-
	Fin whale	General Distribution	E/E	E	Common													-	-	-
	Humpback whale	General Distribution	E/E	E	Common													-	-	-
	Humpback whale	General Distribution	E/E	E	Uncommon													-	-	-
	N.A. right whale	General Distribution	E/E	E	Rare													-	-	-
																		-	-	-

BIRDS



		Monthly Presence												Nest	Mig. (S)	Mig. (F)	Molt
Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-
	D. crested cormorant													-	-	-	-
	Diving birds													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Marsh passerine													-	-	-	-
	Marsh wren													-	-	-	-
	Northern parula													-	Apr-Jun	Jul-Oct	-
	Saltmarsh sharp-tailed sparrow													-	-	-	-
	Seaside sparrow													-	-	-	-
	Shearwaters													-	-	-	-
	Storm-petrels													-	-	-	-
	Bald eagle													-	-	-	-
	Bald eagle													-	-	-	-
	Osprey													-	-	-	-
	Osprey													-	-	-	-
	Phalaropes													-	-	-	-
	Semipalmated sandpiper													-	Apr-Jun	Jul-Oct	-
	Shorebirds													-	-	-	-
	Great egret													-	-	-	-
	Least bittern													-	-	-	-
	Secretive marsh birds													-	-	-	-
	Snowy egret													-	-	-	-
	Virginia rail													-	-	-	-
	Wading birds													-	-	-	-
	Wood duck													-	-	-	-
	Waterfowl													Apr-Jul	-	-	Jul-Aug

FISH




Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Alewife													-	-	-	Apr-Jun	Apr-Jun
	Alewife													-	-	-	Aug-Nov	Feb-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	Aug-Nov	Feb-Jul
	American shad													-	-	-	-	Apr-Jun
	Blueback herring													-	-	-	Aug-Nov	Feb-Jul
	Blueback herring													-	-	-	Apr-Oct	Apr-Jun
	Gizzard shad													Mar-Jun	-	Apr-Jun	Jan-Dec	Jan-Dec
	Hickory shad													-	-	-	Jun-Oct	Feb-Jun
	Striped bass													-	-	-	-	Jan-Dec
	Atl. sharpnose shark													-	-	-	-	May-Oct
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic croaker													-	-	-	Aug-Dec	May-Nov
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Atlantic menhaden													-	-	-	Jan-Dec	May-Oct
	Black drum													-	-	-	-	Apr-Oct
	Black sea bass													Jun-Oct	-	-	Apr-Oct	Apr-Oct
	Bluefish													-	-	-	May-Nov	Apr-Nov
	Kingfishes													Apr-Sep	-	-	-	Apr-Oct
	Mullet													Jul-Oct	-	-	Jan-Dec	Jan-Dec
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	-	Jan-Dec
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	Jan-Dec	Jan-Dec
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Southern flounder													-	-	-	Jan-Dec	-
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spot													-	-	-	Jan-Dec	-
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Summer flounder													-	-	-	Jan-Dec	-
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	White perch													-	-	-	Jan-Dec	Jan-Dec
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Killifish													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Great hammerhead													-	-	-	-	May-Oct
	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jul	-	-	Jan-Dec	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					
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Chain pickerel													Feb-Apr	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Eastern creek chubsucker													Mar-May	-	-	Jan-Dec	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Longnose gar													May-Jun	-	-	Jan-Dec	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleomose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	-	Mar-Oct
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Atlantic mackerel													-	-	-	-	Mar-Apr
	Atlantic needlefish													-	-	-	Jan-Dec	-
	Blacktip shark													-	-	-	-	May-Oct
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Dusky shark													-	-	-	-	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Oct	May-Oct
	Spanish mackerel													-	-	-	-	May-Sep
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	Nov-May	Nov-May
	Thresher shark													-	-	-	-	May-Sep
														-	-	-	-	May-Sep

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
 Cephalopod	Squid													-	-	-	-	Jan-Dec
	Blue crab													-	-	May-Nov	Jan-Dec	Jan-Dec
Crab	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Hermit crab													-	-	-	-	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Lady crab													-	-	-	-	Jan-Dec
	Spider crabs													-	-	-	-	Jan-Dec
	Channeled whelk													-	-	-	Jan-Dec	Jan-Dec
 Gastropod	Knobbed whelk													-	-	-	Jan-Dec	Jan-Dec
	Brown 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	-	-
	Harbor porpoise													-	-	-	-
 Pinniped	Short-beaked common dolphin													-	-	-	-
	Gray seal													-	-	-	-
	Harbor seal													-	-	-	-

TERRESTRIAL MAMMALS

Subelement	Species	Monthly Presence											
		J	F	M	A	M	J	J	A	S	O	N	D
 Small Mammal	Northern river otter												

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	1,714.97	2.68
10B	Freshwater Marshes	439.51	0.69
10C	Swamps	746.41	1.17
10D	Scrub and Shrub Wetlands	319.34	0.50
9A	Sheltered Tidal Flats	106.58	0.17
7	Exposed Tidal Flats	0.19	0.00

ESI SHORELINE HABITAT TYPES

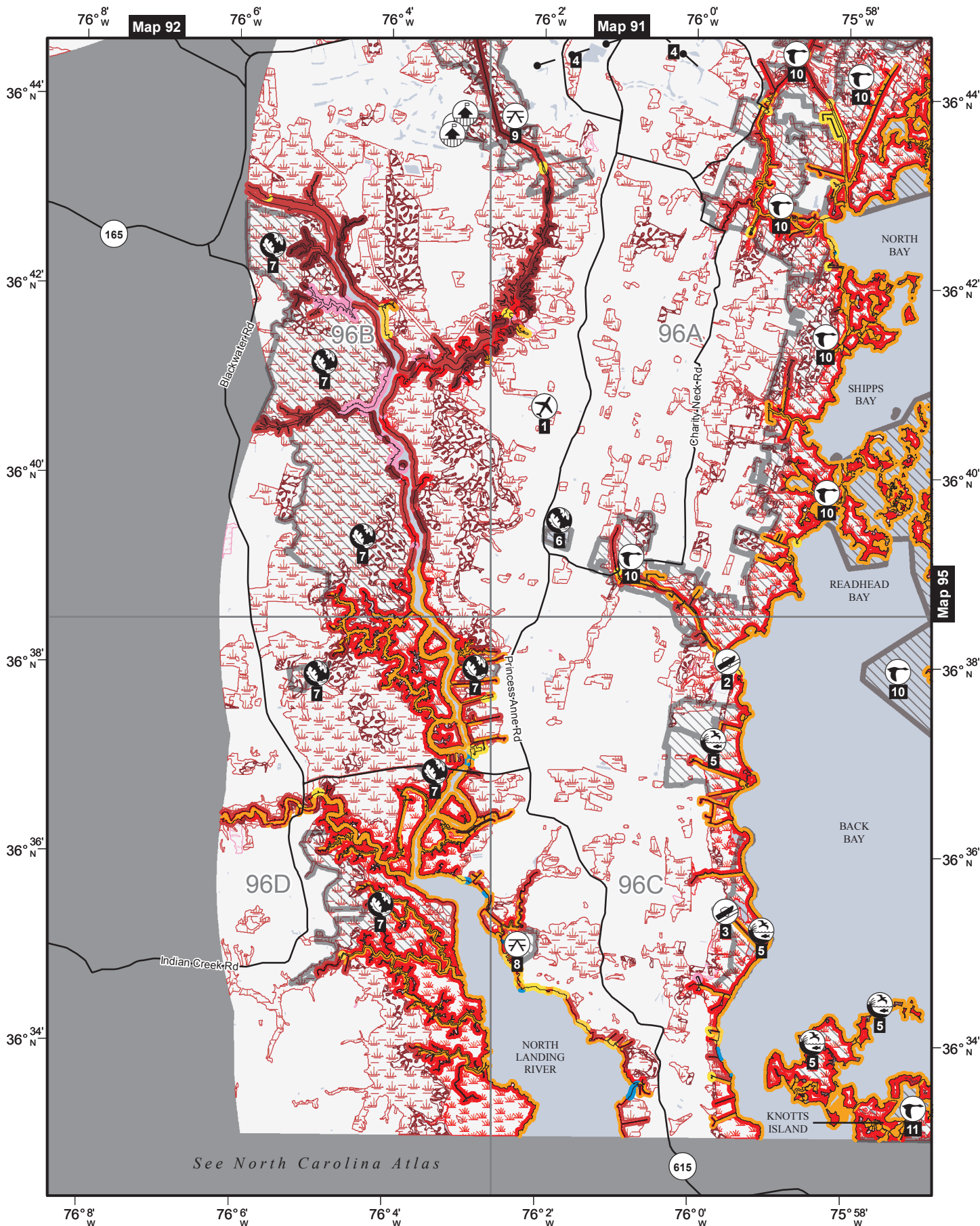
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	90,651.85	56.33	46%
10C	Swamps	1,382.85	0.86	1%
10D	Scrub and Shrub Wetlands	297.65	0.18	< 1%
9A	Sheltered Tidal Flats	91,125.67	56.62	46%
9B	Vegetated Low Banks	1,431.17	0.89	1%
8B	Sheltered, Solid Man-Made Structures	1,322.41	0.82	1%
8C	Sheltered Riprap	1,076.54	0.67	1%
7	Exposed Tidal Flats	15.88	0.01	< 1%
4	Coarse Grained Sand Beaches	472.95	0.29	< 1%
3A	Fine to Medium Grained Sand Beaches	10,694.88	6.65	5%

Total ESI Shoreline: 198,471.85 Total ESI Shoreline: 123.32
 Total Shoreline: 106,178.45 Total Shoreline: 65.98

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

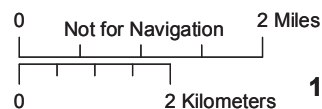




Map 96
Chesapeake South



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



Map 96
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
<i>Map ID</i>	<i>Type</i>	<i>Name</i>	<i>Contact</i>
1	AIRPORT	VIRGINIA BEACH	
2	BOAT RAMP	BACK BAY	LENE PENNINGTON, VDGIF
3	BOAT RAMP	PRINCESS ANNE WMA	LENE PENNINGTON, VDGIF
			804-367-0058
			804-367-0058

DISPLAYED ON MAP (LINES)			
<i>Map ID</i>	<i>Type</i>	<i>Name</i>	<i>Contact</i>
4	PIPELINE	PIPELINE	

DISPLAYED ON MAP (POLYGONS)			
<i>Map ID</i>	<i>Type</i>	<i>Name</i>	<i>Contact</i>
5	MANAGEMENT AREA	PRINCESS ANNE WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES
6	NATURE CONSERVANCY	NAWNEY CREEK FEE	THE NATURE CONSERVANCY
7	NATURE CONSERVANCY	NORTH LANDING RIVER	THE NATURE CONSERVANCY
8	PARK	MUNDEN POINT PARK	CITY OF VIRGINIA BEACH
9	PARK	WEST NECK CREEK PARK	CITY OF VIRGINIA BEACH
10	WILDLIFE REFUGE	BACK BAY NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE
11	WILDLIFE REFUGE	MACKAY ISLAND NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE
			703-841-5300
			703-841-5300
			757-301-7329
			252-429-3100

ALSO PRESENT IN MAPPED AREA (POLYGONS)			
<i>Type</i>	<i>Name</i>	<i>Contact</i>	<i>Phone</i>
STATE PROTECTED AREA	NORTH LANDING RIVER	VA DEPT OF CONSERVATION AND RECREATION	

JURISDICTIONS

COUNTY: CHESAPEAKE CITY, VIRGINIA BEACH CITY
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, 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	7,688.25	12.01
10B	Freshwater Marshes	312.23	0.49
10C	Swamps	15,641.24	24.44
10D	Scrub and Shrub Wetlands	3,802.35	5.94
9A	Sheltered Tidal Flats	132.35	0.21

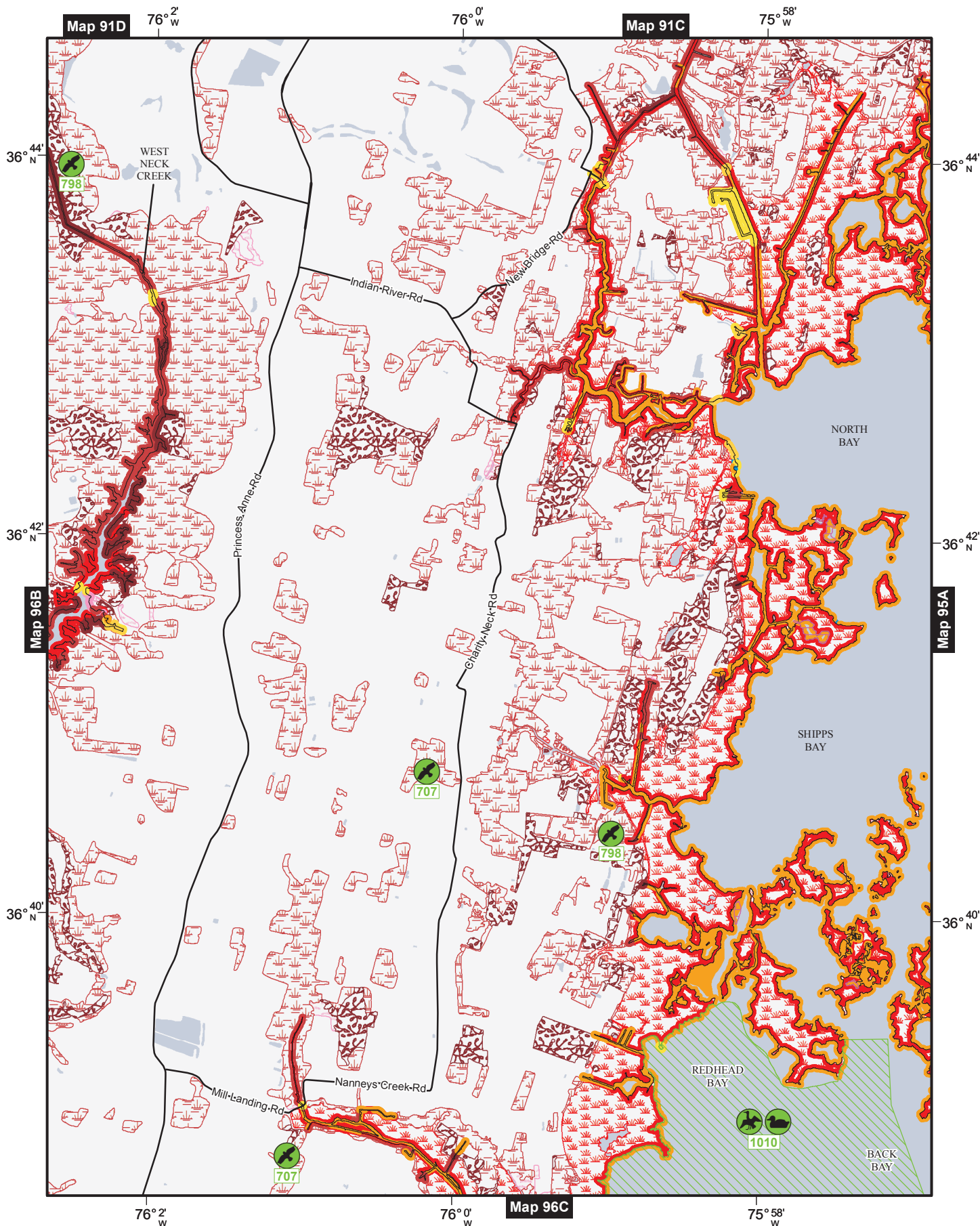
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	448,747.80	278.84	43%
10B	Freshwater Marshes	10,807.22	6.72	1%
10C	Swamps	86,573.67	53.79	8%
10D	Scrub and Shrub Wetlands	30,999.10	19.26	3%
9A	Sheltered Tidal Flats	430,414.40	267.45	41%
9B	Vegetated Low Banks	17,011.68	10.57	2%
8B	Sheltered, Solid Man-Made Structures	7,202.43	4.48	1%
8C	Sheltered Riprap	3,655.37	2.27	< 1%
4	Coarse Grained Sand Beaches	1,720.59	1.07	< 1%
3B	Scarps and Steep Slopes (Sand)	98.36	0.06	< 1%
Total ESI Shoreline:		1,037,230.62	644.51	
Total Shoreline:		534,904.34	332.37	

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



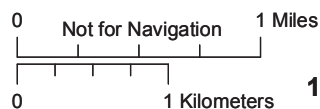


Map 96A

Chesapeake South



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 96A
Chesapeake South

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



Submerged aquatic veg

Mapping Qualifier
High Ecological Value

Concentration
-



BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt
707	Raptor	Bald eagle	Roosting				-													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
1010	Diving	Common loon	Wintering				10S													-	-	-	-
	Diving	Grebes	Wintering				10S													-	-	-	-
	Waterfowl	American coot	Wintering				10,000S													-	-	-	-
	Waterfowl	Northern pintail	Wintering				10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				10S													-	-	-	-
	Waterfowl	Redhead	Wintering				10S													-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt
	Diving	Common loon				10S													-	-	-	-
		Grebes				Present													-	-	-	-
	Raptor	Northern harrier				High													-	-	-	-
	Shorebird	Lesser yellowlegs				-													-	Mar-May	Jul-Sep	-
		Short-billed dowitcher				-													-	Mar-Jun	Jul-Oct	-
	Wading	King rail				-													-	Apr-Jul	-	-
	Waterfowl	American black duck				Present													-	Apr-Jul	-	-
		American black duck				1,000S													-	-	-	-
		American black duck				100S													-	-	-	-
		American coot				1,000S													-	-	-	-
		American wigeon				100S													-	-	-	-
		American wigeon				1,000S													-	-	-	-
		Blue-winged teal				100S													-	Feb-Apr	Aug-Oct	-
		Blue-winged teal				1,000S													-	Feb-Apr	Aug-Oct	-
		Bufflehead				10S													-	-	-	-
		Canada goose				Present													Mar-Aug	-	-	Jun-Jul
		Canada goose				100S													-	-	-	-
		Canvasback				10S													-	-	-	-

Chesapeake South: Map 96A

BIRDS (continued)

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	Canvasback	Wintering			100S													-	-	-	
	Gadwall	Wintering			100S													-	-	-	
	Gadwall	Wintering			1,000S													-	-	-	
Green-winged teal	Green-winged teal	Wintering			1,000S													-	-	-	
	Green-winged teal	Wintering			100S													-	-	-	
	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug	
Mallard	Mallard	Wintering			1,000S													-	-	-	
	Mallard	Wintering			100S													-	-	-	
	Mergansers	Wintering			10S													-	-	-	
Mergansers	Mergansers	Wintering			Present													-	-	-	
	Northern pintail	Wintering			100S													-	-	-	
	Northern shoveler	Wintering			100S													-	-	-	
Northern shoveler	Northern shoveler	Wintering			Present													-	-	-	
	Redhead	Wintering			100S													-	-	-	
	Ring-necked duck	Wintering			100S													-	-	-	
Ruddy duck	Ruddy duck	Wintering			10S													-	-	-	
	Ruddy duck	Wintering			100S													-	-	-	
	Scaup	Wintering			100S													-	-	-	
Snow goose	Snow goose	Wintering			10S													-	-	-	
	Snow goose	Wintering			1,000S													-	-	-	
	Tundra swan	Wintering			100S													-	-	-	
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					
	Diadromous Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec








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					
	Insect Monarch butterfly	Migration			-													-	-	-	-	Sep-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 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													-	Mar-May	Aug-Nov	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-
	Marsh wren													-	-	-	-	-
	Saltmarsh sharp-tailed sparrow													-	-	-	-	-
	Seaside sparrow													-	-	-	-	-
	Bald eagle													Dec-Jun	-	-	-	-
	Osprey													Mar-Aug	-	-	-	-
	Semipalmated sandpiper													-	Apr-Jun	Jul-Oct	-	-
	Great egret													-	-	-	-	-
	Least bittern													-	-	-	-	-
	Snowy egret													-	-	-	-	-
	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													-	-	-	Apr-Jun	Apr-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	-	Apr-Jun
	Blueback herring													-	-	Apr-Jun	Apr-Oct	Apr-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	-	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Mullet													Jul-Oct	-	-	Jan-Dec	Jan-Dec
	Red drum													-	-	-	Jan-Dec	Jan-Dec
	Southern flounder													-	-	-	Jan-Dec	-
	Spot													-	-	-	Jan-Dec	-
	Summer flounder													-	-	-	Jan-Dec	-
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Killifish													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jul	-	-	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Chain pickerel													Feb-Apr	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	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					
	Common carp													May-Jun	-	-	-	Jan-Dec
	Eastern creek chubsucker													Mar-May	-	-	Jan-Dec	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Longnose gar													May-Jun	-	-	Jan-Dec	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Atlantic needlefish													-	-	-	Jan-Dec	-

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Blue crab													-	-	-	Jan-Dec	Jan-Dec

TERRESTRIAL MAMMALS

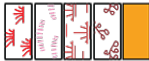
Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Northern river otter													-	-	-	-	-

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	2,648.24	4.14
10B	Freshwater Marshes	65.33	0.10
10C	Swamps	4,552.82	7.11
10D	Scrub and Shrub Wetlands	1,051.61	1.64
9A	Sheltered Tidal Flats	78.63	0.12



ESI SHORELINE HABITAT TYPES

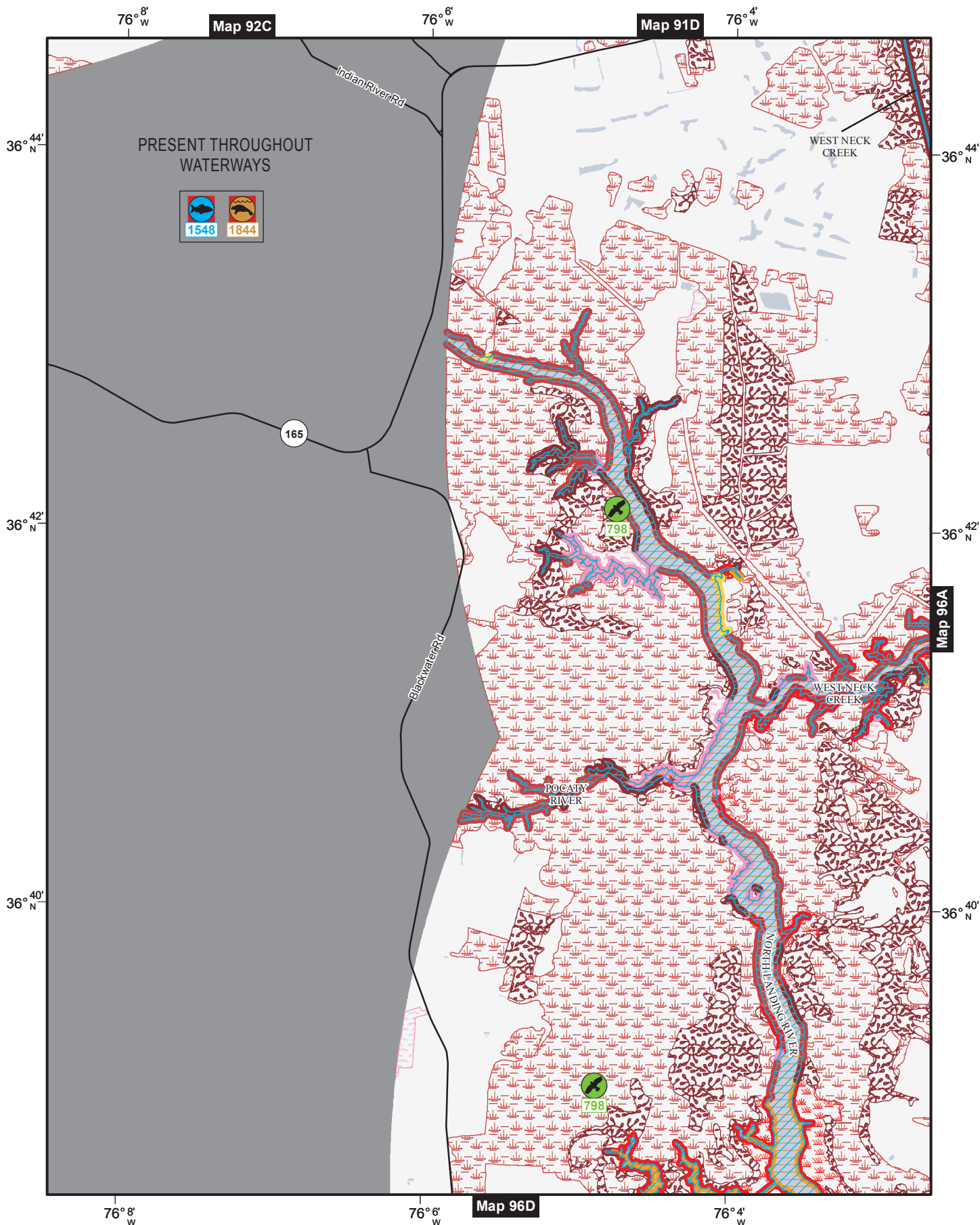
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	162,361.31	100.89	45%
10B	Freshwater Marshes	408.30	0.25	< 1%
10C	Swamps	29,393.63	18.26	8%
10D	Scrub and Shrub Wetlands	7,846.02	4.88	2%
9A	Sheltered Tidal Flats	152,171.82	94.56	42%
9B	Vegetated Low Banks	5,328.05	3.31	1%
8B	Sheltered, Solid Man-Made Structures	3,485.79	2.17	1%
8C	Sheltered Riprap	773.96	0.48	< 1%
4	Coarse Grained Sand Beaches	158.95	0.10	< 1%

Total ESI Shoreline: 361,927.82 Total ESI Shoreline: 224.89
Total Shoreline: 188,685.74 Total Shoreline: 117.24

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



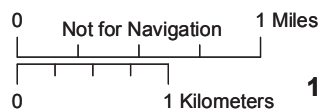


Map 96B

Chesapeake South



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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Map 96B
Chesapeake South

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/V/A		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-

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					
1548	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-												-	-	-	-	Jan-Dec

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				
1844	Manatee	West Indian manatee	General Distribution	-/E	E	Rare												-	-	-	-

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	American eel												-	-	-	Jan-May	Jan-Dec
		Gizzard shad												Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	Striped bass												-	-	-	-	Jan-Dec
	Freshwater	White perch												Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
		Black crappie												Mar-Jul	-	-	Jan-Dec	-
		Bullhead catfish												Apr-Jun	-	-	-	Jan-Dec
		Chain pickerel												Feb-Apr	-	-	-	Jan-Dec
		Channel catfish												May-Jun	-	-	Jan-Dec	Jan-Dec
		Common carp												May-Jun	-	-	-	Jan-Dec
		Golden shiner												May-Jun	-	-	Jan-Dec	Jan-Dec
		Largemouth bass												Apr-Aug	-	-	Jan-Dec	Jan-Dec
		Longnose gar												Mar-May	-	-	-	Jan-Dec
		Redfin pickerel												May-Jun	-	-	Jan-Dec	Jan-Dec
		Sunfish												Feb-Mar	-	-	Jan-Dec	Jan-Dec
		Yellow perch												Mar-Jul	-	-	-	Jan-Dec
														-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

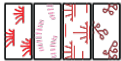
Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Crab													-	-	-	Jan-Dec	Jan-Dec

Chesapeake South: Map 96B

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	240.92	0.38
10B	Freshwater Marshes	172.26	0.27
10C	Swamps	5,977.53	9.34
10D	Scrub and Shrub Wetlands	1,768.77	2.76



ESI SHORELINE HABITAT TYPES

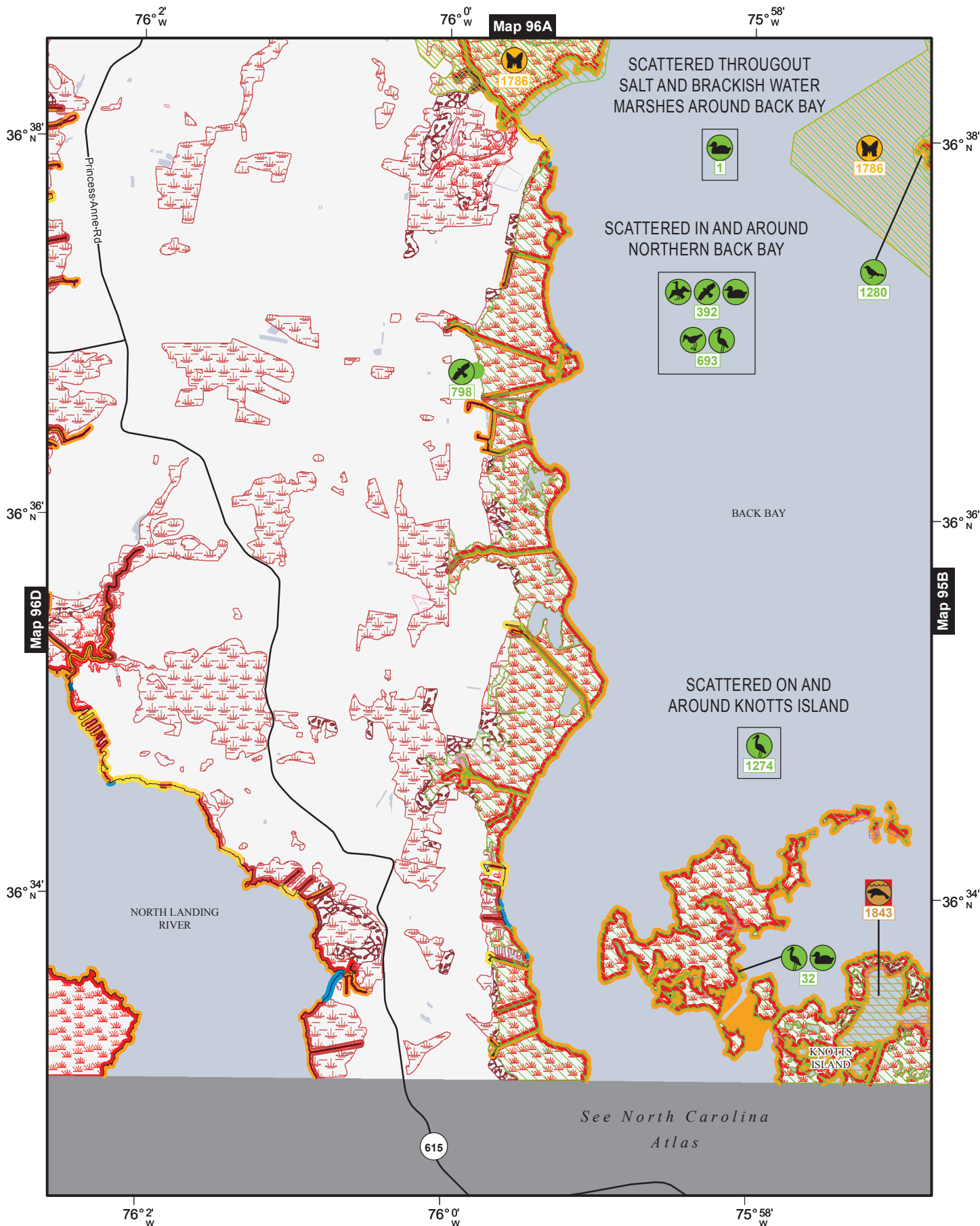
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	19,119.89	11.88	24%
10B	Freshwater Marshes	10,079.79	6.26	13%
10C	Swamps	25,404.07	15.79	32%
10D	Scrub and Shrub Wetlands	14,772.44	9.18	19%
9A	Sheltered Tidal Flats	9,159.80	5.69	12%
9B	Vegetated Low Banks	152.00	0.09	< 1%
8B	Sheltered, Solid Man-Made Structures	290.56	0.18	< 1%
8C	Sheltered Riprap	551.22	0.34	1%

Total ESI Shoreline: 79,529.77 Total ESI Shoreline: 49.42
Total Shoreline: 70,190.92 Total Shoreline: 43.61

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

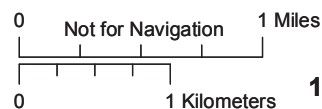




Map 96C
Chesapeake South



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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Map 96C
Chesapeake South

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	D
SAV	Submerged aquatic veg	High Ecological Value			-												

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				
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
32	Wading	King rail	Nesting			-												May-Jun	-	-	-
	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
392	Diving	Common loon	Wintering			10S												-	-	-	-
	Diving	Grebes	Wintering			Present												-	-	-	-
	Raptor	Northern harrier	Wintering			High												-	-	-	-
	Waterfowl	American black duck	Wintering			1,000S												-	-	-	-
	Waterfowl	American coot	Wintering			1,000S												-	-	-	-
	Waterfowl	American wigeon	Wintering			1,000S												-	-	-	-
	Waterfowl	Blue-winged teal	Migration			1,000S												-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canvasback	Wintering			100S												-	-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S												-	-	-	-
	Waterfowl	Mallard	Wintering			1,000S												-	-	-	-
	Waterfowl	Northern pintail	Wintering			100S												-	-	-	-
	Waterfowl	Northern shoveler	Wintering			100S												-	-	-	-
	Waterfowl	Redhead	Wintering			100S												-	-	-	-
693	Shorebird	Lesser yellowlegs	Migration			-												-	Mar-May	Jul-Sep	-
	Shorebird	Short-billed dowitcher	Migration			-												-	Mar-Jun	Jul-Oct	-
	Wading	King rail	Nesting			-												Apr-Jul	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-
1274	Wading	King rail	Nesting			-												May-Jun	-	-	-
1280	Passerine	Purple martin	Roosting			10,000 Indivs												-	-	-	-

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					
1786	Insect	Monarch butterfly	Migration			-												-	-	-	-	Sep-Oct

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Mating	Calving	Pupping	Juveniles	Adults	Molt
1843	Manatee	West Indian manatee	General Distribution		-	/E	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt
	Diving	Common loon				10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Grebes				10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Waterfowl	American black duck				100S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		American coot				10,000S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		American wigeon				100S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Blue-winged teal				100S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Bufflehead				10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Canada goose				100S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Canvasback				10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Gadwall				1,000S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Green-winged teal				100S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Mallard				100S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Mergansers				10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Northern pintail				10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Northern shoveler				10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Redhead				10S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Ring-necked duck				100S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Ruddy duck				100S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Scaup				100S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Snow goose				1,000S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Tundra swan				1,000S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







FISH

Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	Atlantic sturgeon				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






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	West Indian manatee	General Distribution	-/E	E	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													-	Mar-May	Aug-Nov	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Marsh wren													-	-	-	-
	Northern parula													-	Apr-Jun	Jul-Oct	-
	Saltmarsh sharp-tailed sparrow													-	-	-	-
	Seaside sparrow													-	-	-	-
	Bald eagle													Dec-Jun	-	-	-
	Bald eagle													-	-	-	-
	Osprey													Mar-Aug	-	-	-
	Semipalmated sandpiper													-	Apr-Jun	Jul-Oct	-
	Great egret													-	-	-	-
	Least bittern													-	-	-	-
	Snowy egret													-	-	-	-
	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													-	-	-	Apr-Jun	Apr-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	Apr-Jun	Apr-Jun
	Blueback herring													-	-	Apr-Jun	Apr-Oct	Apr-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	-	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Mullet													Jul-Oct	-	-	Jan-Dec	Jan-Dec
	Red drum													-	-	-	Jan-Dec	Jan-Dec
	Southern flounder													-	-	-	Jan-Dec	-
	Spot													-	-	-	Jan-Dec	-
	Summer flounder													-	-	-	Jan-Dec	-
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Killifish													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jul	-	-	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	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					
	Chain pickerel													Feb-Apr	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Eastern creek chubsucker													Mar-May	-	-	Jan-Dec	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Longnose gar													May-Jun	-	-	Jan-Dec	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
Marine Pelagic	Atlantic needlefish													-	-	-	Jan-Dec	-

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Crab	Blue crab													-	-	-	Jan-Dec	Jan-Dec

TERRESTRIAL MAMMALS

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Small Mammal	Northern river otter													-	-	-	-	-

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	2,076.35	3.24
10B	Freshwater Marshes	40.29	0.06
10C	Swamps	1,795.63	2.81
10D	Scrub and Shrub Wetlands	219.87	0.34
9A	Sheltered Tidal Flats	53.72	0.08

ESI SHORELINE HABITAT TYPES

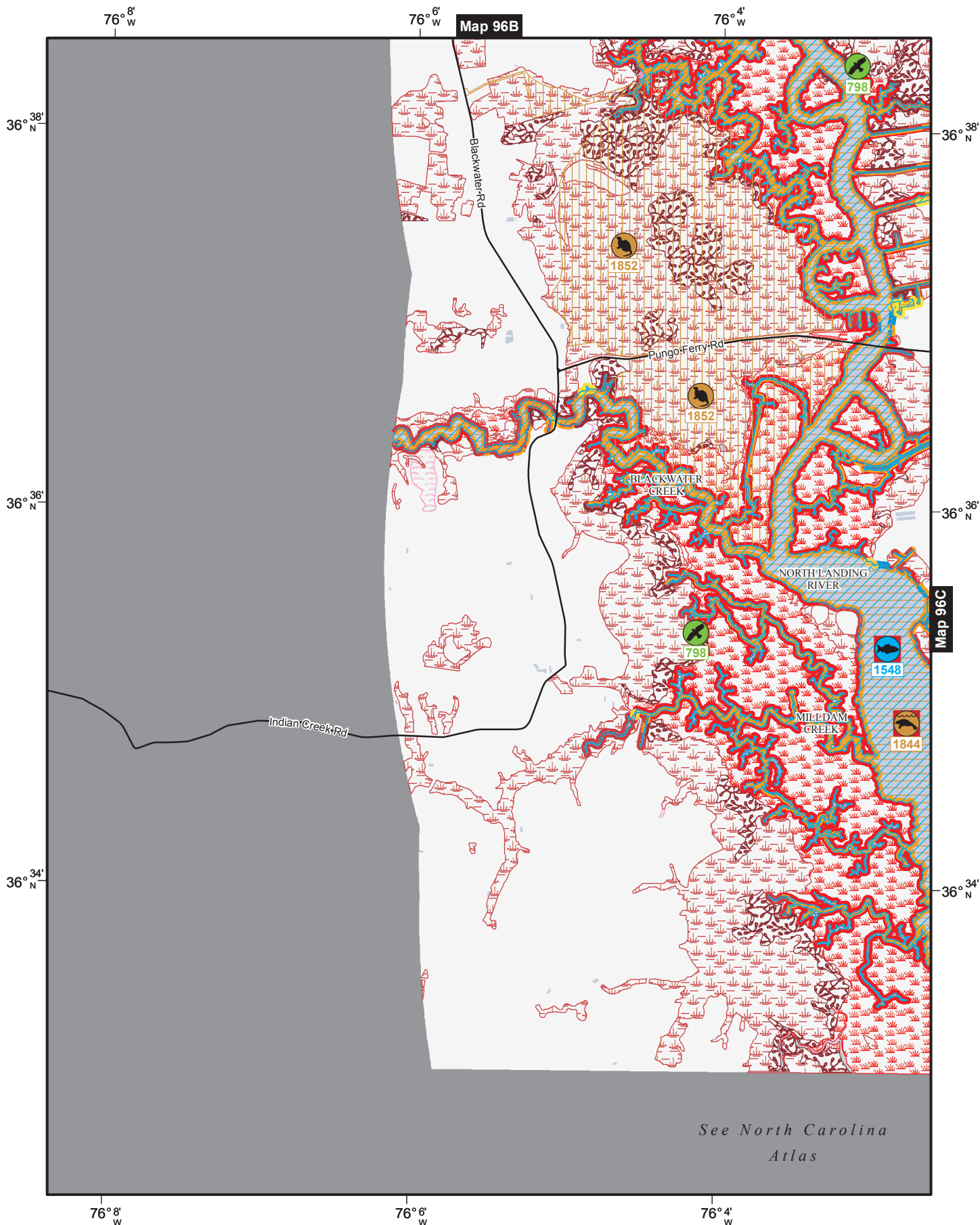
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	98,519.90	61.22	43%
10B	Freshwater Marshes	186.29	0.12	< 1%
10C	Swamps	14,538.32	9.03	6%
10D	Scrub and Shrub Wetlands	1,185.38	0.74	1%
9A	Sheltered Tidal Flats	100,106.63	62.20	44%
9B	Vegetated Low Banks	8,516.13	5.29	4%
8B	Sheltered, Solid Man-Made Structures	2,486.05	1.54	1%
8C	Sheltered Riprap	2,028.86	1.26	1%
4	Coarse Grained Sand Beaches	1,017.96	0.63	< 1%
3B	Scarps and Steep Slopes (Sand)	98.36	0.06	< 1%

Total ESI Shoreline: 228,683.88 Total ESI Shoreline: 142.10
 Total Shoreline: 105,266.49 Total Shoreline: 65.41

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



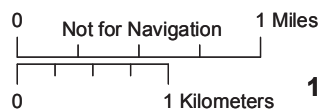


Map 96D

Chesapeake South



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 96D
Chesapeake South

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	MD/VA	S	F	Concentration	Mapping Qualifier	Monthly Presence	Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
798	Raptor	Bald eagle				1 Nest	Nesting	J F M A M J J A S O N D	Dec-Jun	-	-	-	-

FISH

Map ID	Subelement	Species	MD/VA	S	F	Concentration	Mapping Qualifier	Monthly Presence	Spawn	Eggs	Larvae	Juveniles	Adults
1548	Diadromous	Atlantic sturgeon		-/E	E	-	General Distribution	J F M A M J J A S O N D	-	-	-	-	Jan-Dec

MARINE MAMMALS

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

TERRESTRIAL MAMMALS




Map ID	Subelement	Species	MD/VA	S	F	Concentration	Mapping Qualifier	Monthly Presence	Spawn	Eggs	Larvae	Juveniles	Adults
1852	Small Mammal	Dismal Swamp SE shrew		-	-	-	Vulnerable Occurrence	J F M A M J J A S O N D	-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

Subelement	Species	Monthly Presence	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	J F M A M J J A S O N D	-	-	-	Apr-Jun	Apr-Jun
	American eel		-	-	-	Jan-May	Jan-Dec
	American shad		-	-	-	-	Apr-Jun
	Blueback herring		-	-	Apr-Jun	Apr-Oct	Apr-Jun
	Gizzard shad		Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass		-	-	-	-	Jan-Dec
	Atlantic croaker		-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic menhaden		-	-	-	May-Nov	May-Oct
	Mullet		Jul-Oct	-	-	Jan-Dec	Jan-Dec
	Red drum		-	-	-	Jan-Dec	Jan-Dec
	Southern flounder		-	-	-	Jan-Dec	-
	Spot		-	-	-	Jan-Dec	-
	Summer flounder		-	-	-	Jan-Dec	-
	White perch		Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Killifish		-	-	-	Jan-Dec	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					
 Fish  Freshwater	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jul	-	-	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Chain pickerel													Feb-Apr	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Eastern creek chubsucker													Mar-May	-	-	Jan-Dec	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
 Marine Pelagic	Longnose gar													May-Jun	-	-	Jan-Dec	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
	Atlantic needlefish													-	-	-	Jan-Dec	-

INVERTEBRATES

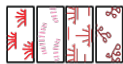
Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
 Crab	Blue crab													-	-	-	Jan-Dec	Jan-Dec

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

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	2,722.74	4.25
10B	Freshwater Marshes	34.35	0.05
10C	Swamps	3,315.27	5.18
10D	Scrub and Shrub Wetlands	762.09	1.19



ESI SHORELINE HABITAT TYPES

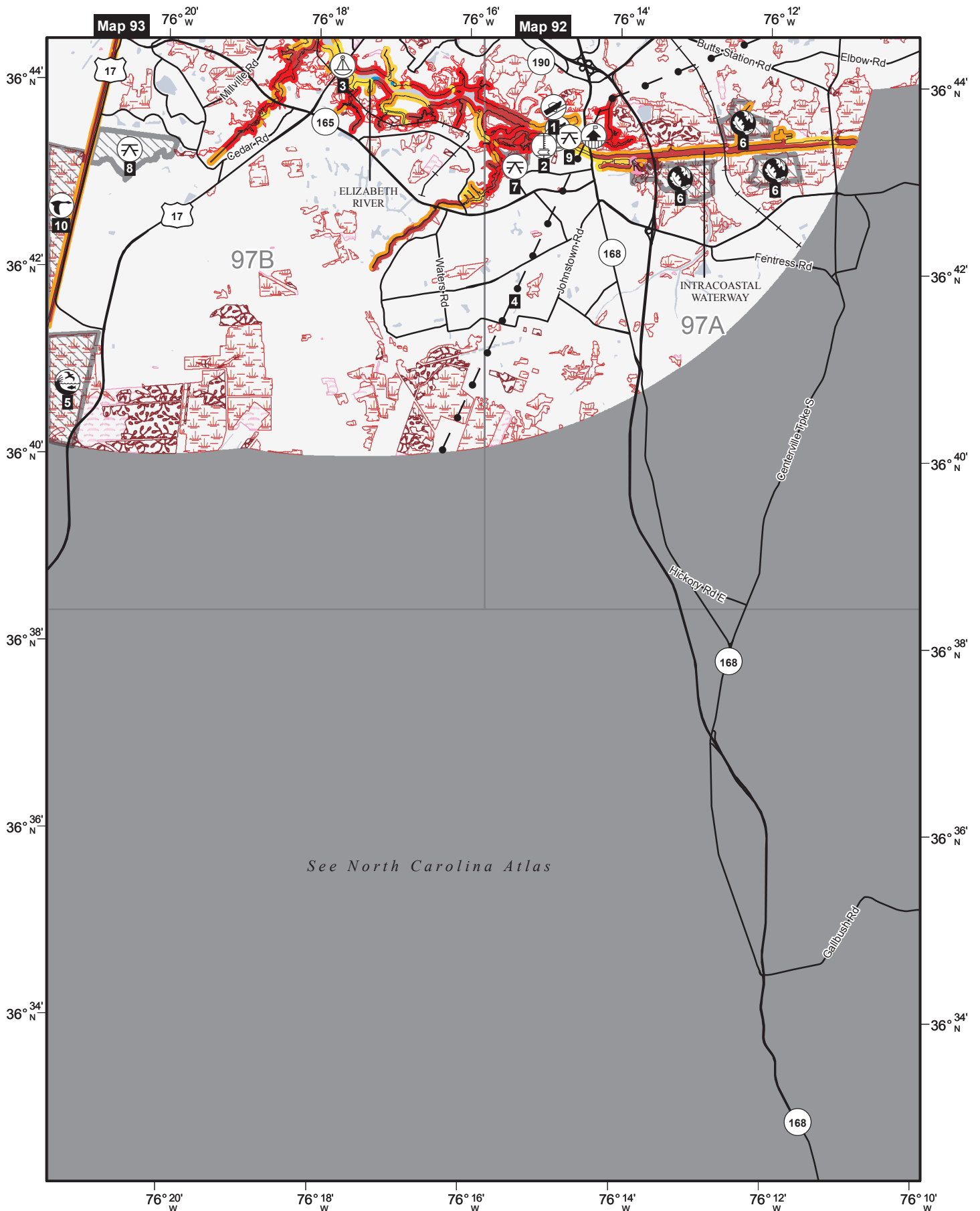
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	168,746.70	104.85	46%
10B	Freshwater Marshes	132.84	0.08	< 1%
10C	Swamps	17,237.65	10.71	5%
10D	Scrub and Shrub Wetlands	7,195.27	4.47	2%
9A	Sheltered Tidal Flats	168,976.15	105.00	46%
9B	Vegetated Low Banks	3,015.49	1.87	1%
8B	Sheltered, Solid Man-Made Structures	940.04	0.58	< 1%
8C	Sheltered Riprap	301.32	0.19	< 1%
4	Coarse Grained Sand Beaches	543.68	0.34	< 1%

Total ESI Shoreline: 367,089.15 Total ESI Shoreline: 228.10
 Total Shoreline: 170,761.20 Total Shoreline: 106.11

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

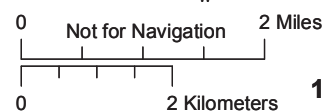




Map 97
Chesapeake South



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



1:100,000



Map 97
Chesapeake South

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	BOAT RAMP	GREAT BRIDGE	VIRGINIA DEPT. OF GAME AND INLAND FISHERIES	804-367-1000
2	LOCK AND DAM	GREAT BRIDGE LOCK		
3	REPEATED MEASUREMENT SITE	WQ - STATION SBD4	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (LINES)		
Map ID	Type	Phone
4	PIPELINE	

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
5	MANAGEMENT AREA	CAVALIER WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES	703-841-5300
6	NATURE CONSERVANCY	NORTH LANDING RIVER	THE NATURE CONSERVANCY	
7	PARK	BELLS MILL PARK	CITY OF CHESAPEAKE	
8	PARK	DEEP CREEK PARK	CITY OF CHESAPEAKE	
9	PARK	GREAT BRIDGE LOCK PARK	CITY OF CHESAPEAKE	757-986-3705
10	WILDLIFE REFUGE	GREAT DISMAL SWAMP NWR	UNITED STATES FISH AND WILDLIFE SERVICE	

JURISDICTIONS

COUNTY: CHESAPEAKE CITY
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, NORFOLK DISTRICT


FEMA: REGION I
EPA: REGION 3

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	700.58	1.09
	10B	Freshwater Marshes	459.74	0.72
	10C	Swamps	4,715.23	7.37
	10D	Scrub and Shrub Wetlands	920.40	1.44

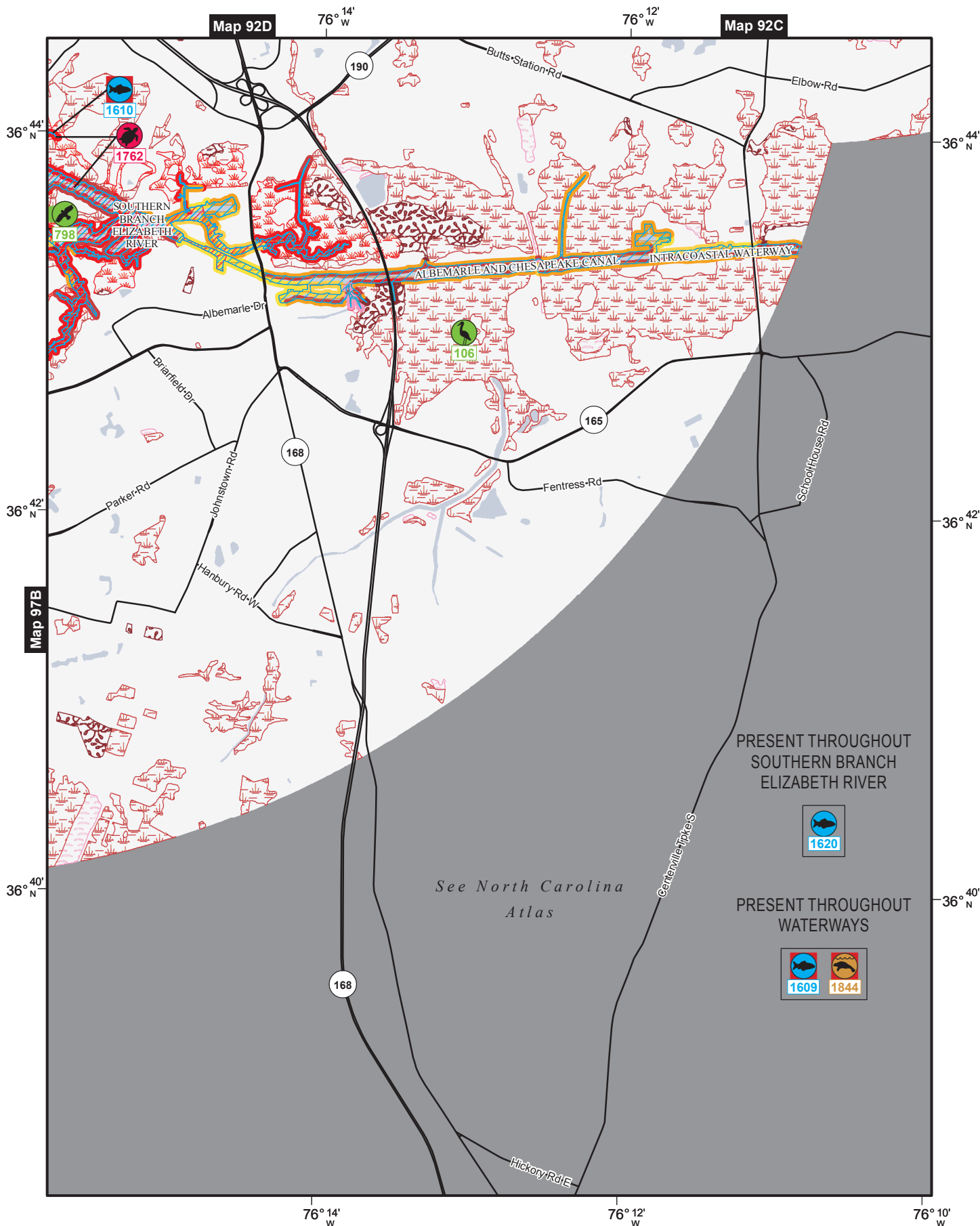
ESI SHORELINE HABITAT TYPES

	<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	44,265.86	27.51	34%
	10B	Freshwater Marshes	1,052.43	0.65	1%
	10C	Swamps	34,375.98	21.36	27%
	10D	Scrub and Shrub Wetlands	1,448.03	0.90	1%
	9B	Vegetated Low Banks	31,163.53	19.36	24%
	8B	Sheltered, Solid Man-Made Structures	8,148.39	5.06	6%
	8C	Sheltered Riprap	7,664.81	4.76	6%
	4	Coarse Grained Sand Beaches	345.22	0.21	< 1%
Total ESI Shoreline:			128,464.25	79.82	
Total Shoreline:			98,239.14	61.04	

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

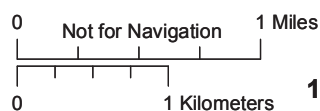




Map 97A
Chesapeake South



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 97A
Chesapeake South

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		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
106	Wading	Great blue heron	Nesting			34 Nests												Feb-Jun	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-

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					
1609	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Mar-May	Jan-Dec	-
	Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
1610	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Nursery Area			-													-	-	Mar-May	Jan-Dec	-
	Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Blueback herring	Migration			-													-	-	-	Aug-Nov	Mar-Jun
						-													-	-	-	-	-

REPTILES & AMPHIBIANS


Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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1762	Turtle	Diamondback terrapin	Concentration Area			High																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

	Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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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	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
Fish	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
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleamose skate													-	-	-	-	Jun-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
Marine Pelagic	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	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					
Cephalopod	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	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

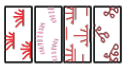
MARINE MAMMALS

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

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	316.54	0.49
10B	Freshwater Marshes	78.85	0.12
10C	Swamps	1,972.36	3.08
10D	Scrub and Shrub Wetlands	197.45	0.31



ESI SHORELINE HABITAT TYPES

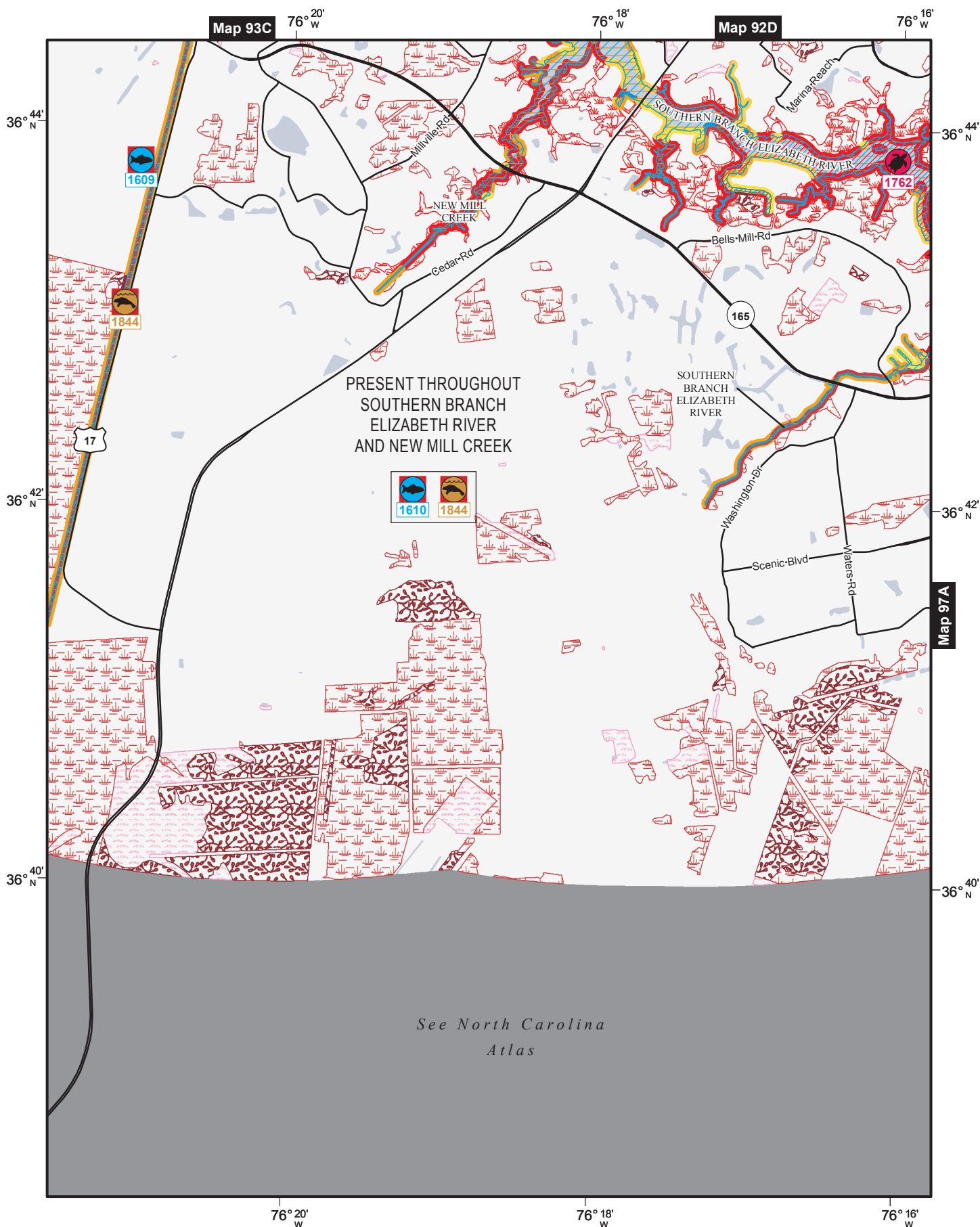
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	17,797.73	11.06	32%
10B	Freshwater Marshes	1,026.67	0.64	2%
10C	Swamps	14,152.11	8.79	26%
10D	Scrub and Shrub Wetlands	957.07	0.59	2%
9B	Vegetated Low Banks	13,436.17	8.35	24%
8B	Sheltered, Solid Man-Made Structures	4,274.56	2.66	8%
8C	Sheltered Riprap	3,718.79	2.31	7%

Total ESI Shoreline: 55,363.10 Total ESI Shoreline: 34.40
 Total Shoreline: 42,573.70 Total Shoreline: 26.45

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



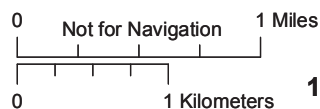


Map 97B

Chesapeake South



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 97B
Chesapeake South

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F -/E E	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
1609	Diadromous	Atlantic sturgeon	General Distribution	-	-													-	-	Jan-Dec	Jan-Dec	Jan-Dec
1610	Diadromous	Striped bass	Nursery Area	-	-													-	-	Mar-May	Jan-Dec	-
	Diadromous	Alewife	Migration	-	-													-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E													-	-	Jan-Dec	Jan-Dec	Jan-Dec
	Diadromous	Blueback herring	Migration	-	-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Striped bass	Nursery Area	-	-													-	-	Mar-May	Jan-Dec	-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F -/E E	Concentration	Monthly Presence												Nest	Hatch	Interest	Juveniles	Adults
						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

MARINE MAMMALS

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

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	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
Estuarine Nursery	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	-	Jan-Jun
	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
	Kingfishes													-	-	-	-	Apr-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Pigfish													-	-	-	-	Apr-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	-	Apr-Nov

Chesapeake South: Map 97B

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jan-Dec	Jan-Dec
	White perch													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jun-Dec
	Northern searobin													-	-	-	-	Apr-Sep
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	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	Interest	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					
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-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

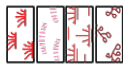
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													May-Aug	May-Aug	-	-

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	384.03	0.60
10B	Freshwater Marshes	380.89	0.60
10C	Swamps	2,742.87	4.29
10D	Scrub and Shrub Wetlands	722.95	1.13



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	26,468.13	16.45	36%
10B	Freshwater Marshes	25.76	0.02	< 1%
10C	Swamps	20,223.87	12.57	28%
10D	Scrub and Shrub Wetlands	490.96	0.31	1%
9B	Vegetated Low Banks	17,727.36	11.02	24%
8B	Sheltered, Solid Man-Made Structures	3,873.83	2.41	5%
8C	Sheltered Riprap	3,946.02	2.45	5%
4	Coarse Grained Sand Beaches	345.22	0.21	< 1%
Total ESI Shoreline:		73,101.15	45.42	
Total Shoreline:		55,665.44	34.59	

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



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		Map ID
	National Estuarine Research Reserve		
	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.

