Environmental Sensitivity Index Maps

A Guide to Coastal Resources at Risk to Spilled Oil

Chesapeake Bay: Volume 1
Upper Bay

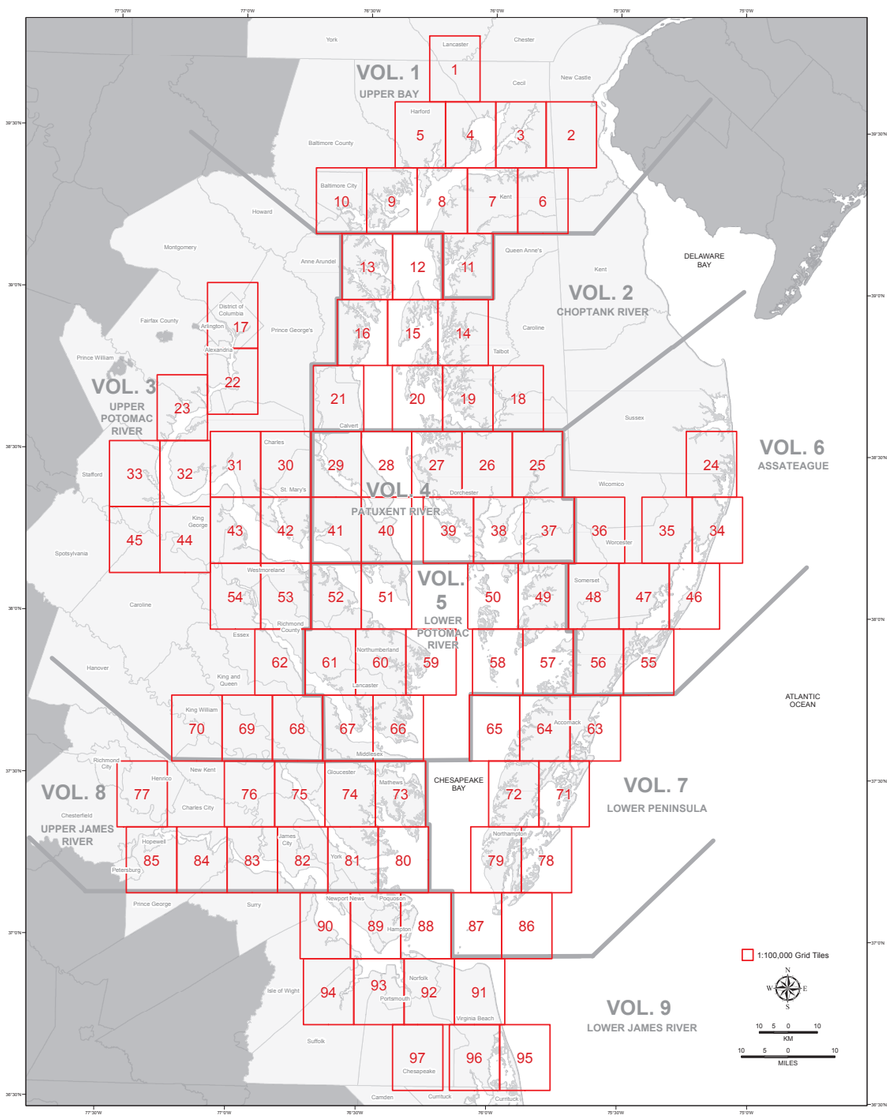
Office of Response and Restoration

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



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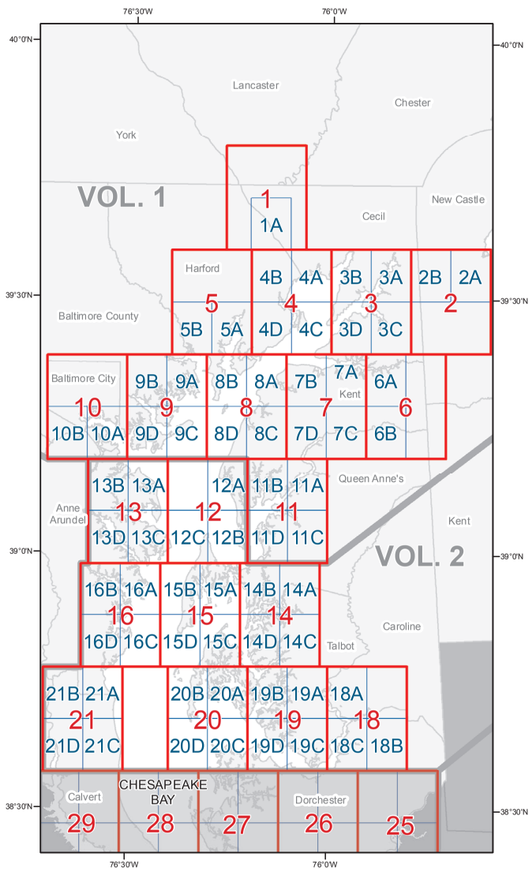

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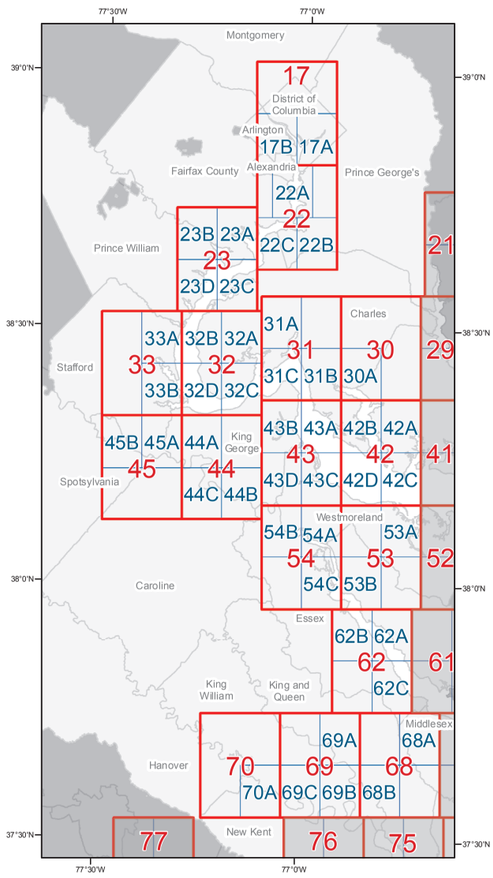

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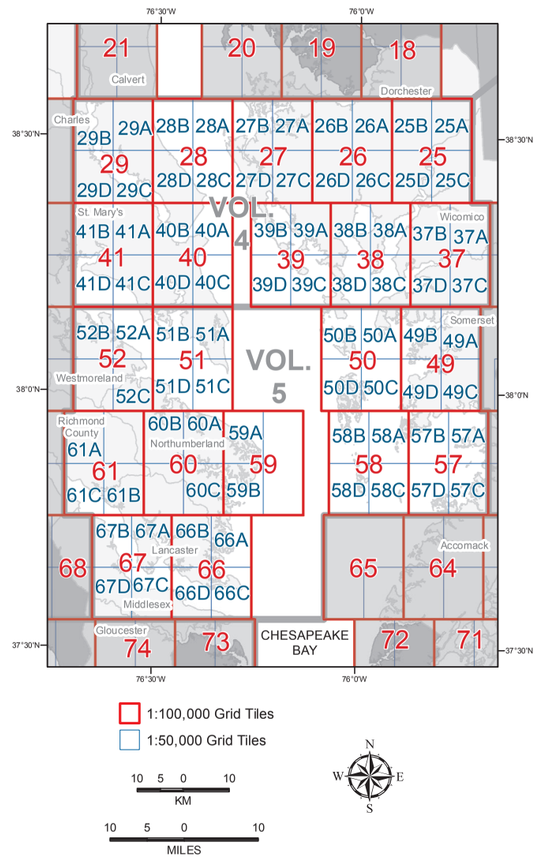

CONTENTS

Environmental Sensitivity Index Maps

Maps 12-16, 18-21 contained in Volume 2;
Maps 17, 22-23, 30-33, 42-45, 53-54, 62, 68-70 contained in Volume 3;
Maps 25-29, 37-41 contained in Volume 4;
Maps 49-52, 57-61, 66-67 contained in Volume 5;
Maps 24, 34-36, 46-48, 55-56 contained in Volume 6;
Maps 63-65, 71-72, 78-79, 86-87 contained in Volume 7;
Maps 73-77, 80-85 contained in Volume 8;
Maps 88-97 contained in Volume 9.

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, Pompco 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)
2) Exposure to wave and tidal energy
3) Biological productivity and sensitivity
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
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

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	Chinco-teague, VA	757/336-6122	Chincoteague and Wallops Island NWRs
Alex Wilke	TNC	Nassa-wadox, VA	757/442-3049	Eastern Shore species
Ruth Boettcher	VDGIF	Machi-pongo, 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.**

Major Data Sources Used: Birds

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eBird. 2016. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available at: http://www.ebird.org. (Accessed: March 2016).

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Saltmarsh Habitat and Avian Research Program. 2015. Patch analysis of marsh bird distribution, vector digital data.

The Nature Conservancy. 2015. Shorebird Flats ESI 2015, vector digital data.

TNC, VDGIF, USFWS. 2013. American Oystercatcher (AMOY) 2013 statewide survey pair locations, vector digital data.

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USFWS Back Bay National Wildlife Refuge. Back Bay National Wildlife Refuge and False Cape State Park Aerial Surveys 2009-2014, spreadsheet.

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

USFWS DMB. 2014. Atlantic coast seabird survey data, vector digital data.

USFWS Division of Migratory Birds DMB. 2012. Atlantic coast wintering sea duck survey data, vector digital data.

USFWS Division of Migratory Birds DMB. 2014. Mid-winter waterfowl surveys 2004-2015, vector digital data and spreadsheet.

USFWS. 2015. James River National Wildlife Refuge Final Comprehensive Conservation Plan. U.S. Fish & Wildlife Service, Warsaw, VA, 11 pp.

USFWS. 2008. Mackay Island National Wildlife Refuge Comprehensive Conservation Plan. U.S. Fish & Wildlife Service, Virginia Beach, VA, 214 pp.

USFWS. 2012. Presquile National Wildlife Refuge Comprehensive Conservation Plan. U.S. Fish & Wildlife Service, Warsaw, VA, 306 pp.

USFWS DMB. 2011. Southern black scoter survey, vector digital data.

VDGIF 2015. Midwinter waterfowl surveys 2004-2015, vector digital data an spreadsheet.

VDGIF. 2015. Virginia Fish and Wildlife Information System (VaFWIS) – Wildlife and Environmental Review Map Service (WERMS). Bald Eagle Concentration Areas and Roosts – BECAR, vector digital data.

Watts, B.D. and B.J. Paxton (CCB). 2015. Chesapeake Bay Drainage Great Blue Heron and Great Egret Survey 2013, vector digital data.

Watts, B.D. and B.R. Truitt. 2015. Spring migration of red knots along the Virginia barrier islands. The Journal of Wildlife Management 79: 288-295.

Watts, B.D. and B J. Paxton (CCB). 2014. Status and distribution of colonial waterbirds in coastal Virginia: 2013 breeding season, spreadsheet and document.

Watts, B.D. and M.A. Byrd (CCB). 2015. Virginia Eagle Nests 20151223. College of William & Mary and Virginia Commonwealth University. Williamsburg, VA, vector digital data.

Watts, B.D. and E. Mojica (CCB). 2015. Virginia peregrine falcon monitoring and management program: Year 2015 report.

Williams K.A., I.J. Stenhouse, E.E. Connelly, and S.M. Johnson. 2015. Baseline Wildlife Studies Offshore of Maryland. Biodiversity Research Institute. Portland, Maine. Science Communications Series BRI 2015-20, 8 pp

Wilson. M.D. (CCB). 2016. Black rail VA data 2007-2014, vector digital data.

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

Isdell, R.E., R.M. Chambers, D.M. Bilkovic, and M. Leu. 2015. Effects of terrestrial-aquatic connectivity on an estuarine turtle, Diversity and Distributions (2015) 1-11.

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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VDGIF. 2015. Virginia sea turtle nest data, 1970-2015, tabular data.

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

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 (ChesMMAP), 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 ChesMMAP and the VIMS Juvenile Fish and Blue Crab Trawl Survey were used to map fish species distributions within Chesapeake Bay and its tributaries. ChesMMAP 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 ChesMMAP 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
Zostera Community	*Zostera marina** *Ruppia maritima*	January – December
Ruppia Community	*Ruppia maritima** *Potamogeton perfoliatus* *Potamogeton pectinatus* *Zannichellia palustris*	January – December
Potamogeton Community	*Potamogeton pectinatus** *Potamogeton perfoliatus** *Potamogeton crispus* *Elodea canadensis*	May – November
Freshwater Mixed Community	*Myriophyllum spicatum** *Hydrilla verticillata** *Vallisneria americana** *Ceratophyllum demersum* *Heteranthera dubia* *Elodea canadensis* *Najas* spp. *Potamogeton crispus* *Potamogeton pusillus*	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:

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

State endangered plant genera mapped in Maryland:

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

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


Airport


Anchorage

Aquaculture


Artificial Reef


Beach


Boat Ramp


Commercial Fishing

Critical Habitat

EPA Facility


Ferry


Heliport


Historical Site


Lock and Dam


Management Area


Marina


Military Installation


Mooring Site


National Estuarine Research Reserve

National Park


Nature Conservancy


Park


Port


Recreational Fishing


Repeated Measurement Site


State Protected Area


Tribal Land


Water Intake


Wildlife Refuge

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 ENCs) 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

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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
BENTHIC	
SAV	
Submerged aquatic vegetation	-
BIRDS	
ALCID	
Alcids	-
DIVING	
American white pelican	*Pelecanus erythrorhynchos*
Brown pelican	*Pelecanus occidentalis*
Common loon	*Gavia immer*
Diving birds	-
Double-crested cormorant	*Phalacrocorax auritus*
Grebes	-
Horned grebe	*Podiceps auritus*
Pied-billed grebe	*Podilymbus podiceps*
Red-necked grebe	*Podiceps grisegena*
Red-throated loon	*Gavia stellata*
GULL_TERN	
Black skimmer	*Rynchops niger*
Bonaparte's gull	*Larus philadelphia*
Caspian tern	*Hydroprogne caspia*
Common tern	*Sterna hirundo*
Forster's tern	*Sterna forsteri*
Great black-backed gull	*Larus marinus*
Gull-billed tern	*Gelochelidon nilotica*
Gulls	-
Herring gull	*Larus argentatus*
Laughing gull	*Larus atricilla*
Least tern	*Sternula antillarum*
Ring-billed gull	*Larus delawarensis*
Roseate tern	*Sterna dougallii*
Royal tern	*Thalasseus maximus*
Sandwich tern	*Thalasseus sandvicensis*
Terns	-
PASSERINE	
Coastal plain swamp sparrow	*Melospiza georgiana nigrescens*
Le Conte's sparrow	*Ammodramus leconteii*

Common Name	Scientific Name
BIRDS, cont.	
PASSERINE, cont.	
Marsh passerine	-
Marsh wren	*Cistothorus palustris*
Nelson's sharp-tailed sparrow	*Ammodramus nelsoni*
Northern parula	*Setophaga americana*
Prothonotary warbler	*Protonotaria citrea*
Purple martin	*Progne subis*
Saltmarsh sharp-tailed sparrow	*Ammodramus caudacutus*
Savannah sparrow	*Passerculus sandwichensis*
Seaside sparrow	*Ammodramus maritimus*
Sedge wren	*Cistothorus platensis*
Swamp sparrow	*Melospiza georgiana*
PELAGIC	
Northern gannet	*Morus bassanus*
Shearwaters	-
Storm-petrels	*Oceanodroma spp.*
RAPTOR	
Bald eagle	*Haliaeetus leucocephalus*
Northern harrier	*Circus cyaneus*
Osprey	*Pandion haliaetus*
Peregrine falcon	*Falco peregrinus*
Red-tailed hawk	*Buteo jamaicensis*
SHOREBIRD	
American oystercatcher	*Haematopus palliatus*
Black-bellied plover	*Pluvialis squatarola*
Common snipe	*Gallinago gallinago*
Dowitchers	*Limnodromus spp.*
Dunlin	*Calidris alpina*
Greater yellowlegs	*Tringa melanoleuca*
Killdeer	*Charadrius vociferus*
Least sandpiper	*Calidris minutilla*
Lesser yellowlegs	*Tringa flavipes*
Phalaropes	*Phalaropus spp.*
Piping plover	*Charadrius melodus*
Red knot	*Calidris canutus*
Ruddy turnstone	*Arenaria interpres*
Sanderling	*Calidris alba*

SPECIES LIST

Common Name	Scientific Name
BIRDS, cont.	
SHOREBIRDS, cont.	
Semipalmated plover	*Charadrius semipalmatus*
Semipalmated sandpiper	*Calidris pusilla*
Shorebirds	-
Short-billed dowitcher	*Limnodromus griseus*
Solitary sandpiper	*Tringa solitaria*
Spotted sandpiper	*Actitis macularia*
Stilt sandpiper	*Calidris himantopus*
Western sandpiper	*Calidris mauri*
Whimbrel	*Numenius phaeopus*
Willet	*Tringa semipalmata*
Wilson's plover	*Charadrius wilsonia*
Yellowlegs	*Tringa spp.*
WADING	
American bittern	*Botaurus lentiginosus*
American woodcock	*Scolopax minor*
Black rail	*Laterallus jamaicensis*
Black-crowned night-heron	*Nycticorax nycticorax*
Cattle egret	*Bubulcus ibis*
Clapper rail	*Rallus longirostris*
Glossy ibis	*Plegadis falcinellus*
Great blue heron	*Ardea herodias*
Great egret	*Ardea alba*
Green heron	*Butorides virescens*
King rail	*Rallus elegans*
Least bittern	*Ixobrychus exilis*
Little blue heron	*Egretta caerulea*
Rails	-
Secretive marsh birds	-
Snowy egret	*Egretta thula*
Sora	*Porzana carolina*
Tricolored heron	*Egretta tricolor*
Virginia rail	*Rallus limicola*
Wading birds	
White ibis	*Eudocimus albus*
Yellow-crowned night-heron	*Nyctanassa violacea*

Common Name	Scientific Name
BIRDS, cont.	
WATERFOWL	
American black duck	*Anas rubripes*
American coot	*Fulica americana*
American wigeon	*Anas americana*
Blue-winged teal	*Anas discors*
Brant	*Branta bernicla*
Bufflehead	*Bucephala albeola*
Canada goose	*Branta canadensis*
Canvasback	*Aythya valisineria*
Common goldeneye	*Bucephala clangula*
Common moorhen	*Gallinula chloropus*
Dabbling ducks	-
Diving ducks	-
Gadwall	*Anas strepera*
Geese	-
Greater scaup	*Aythya marila*
Green-winged teal	*Anas crecca*
Hooded merganser	*Lophodytes cucullatus*
Lesser scaup	*Aythya affinis*
Long-tailed duck	*Clangula hyemalis*
Mallard	*Anas platyrhynchos*
Mergansers	-
Northern pintail	*Anas acuta*
Northern shoveler	*Anas clypeata*
Red-breasted merganser	*Mergus serrator*
Redhead	*Aythya americana*
Ring-necked duck	*Aythya collaris*
Ruddy duck	*Oxyura jamaicensis*
Scaup	*Aythya spp.*
Scoters	*Melanitta spp.*
Snow goose	*Chen caerulescens*
Surf scoter	*Melanitta perspicillata*
Tundra swan	*Cygnus columbianus columbianus*
Waterfowl	-
Wood duck	*Aix sponsa*
FISH	
FISH	
Alewife	*Alosa pseudoharengus*

SPECIES LIST

Common Name	Scientific Name
FISH, cont.	
American eel	*Anguilla rostrata*
American shad	*Alosa sapidissima*
Anchovies	-
Atlantic angel shark	*Squatina dumeril*
Atlantic croaker	*Micropogonias undulates*
Atlantic herring	*Clupea harengus*
Atlantic mackerel	*Scomber scombrus*
Atlantic menhaden	*Brevoortia tyrannus*
Atlantic needlefish	*Strongylura marina*
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*
Atlantic spadefish	*Chaetodipterus faber*
Atlantic sturgeon	*Acipenser oxyrinchus*
Black crappie	*Pomoxis nigromaculatus*
Black drum	*Pogonias cromis*
Black sea bass	*Centropristis striata*
Blacktip shark	*Carcharhinus limbatus*
Blue catfish	*Ictalurus furcatus*
Blueback herring	*Alosa aestivalis*
Bluefish	*Pomatomus saltatrix*
Bullhead catfish	*Ameiurus spp.*
Butterfish	*Peprilus triacanthus*
Chain pickerel	*Esox niger*
Channel catfish	*Ictalurus punctatus*
Chesapeake logperch	*Percina bimaculata*
Clearnose skate	*Raja eglanteria*
Cobia	*Rachycentron canadum*
Common carp	*Cyprinus carpio*
Cownose ray	*Rhinoptera bonasus*
Crevalle jack	*Caranx hippos*
Dusky shark	*Carcharhinus obscurus*
Eastern creek chubsucker	*Erimyzon oblongus*
Gizzard shad	*Dorosoma cepedianum*
Golden shiner	*Notemigonus crysoleucas*
Great hammerhead	*Sphyrna mokarran*
Great white shark	*Carcharodon carcharias*
Harvestfish	*Peprilus alepidotus*
Hickory shad	*Alosa mediocris*

Common Name	Scientific Name
FISH, cont.	
Killifish	*Fundulus spp.*
Kingfishes	*Menticirrhus spp.*
Largemouth bass	*Micropterus salmoides*
Lined seahorse	*Hippocampus erectus*
Longnose gar	*Lepisosteus osseus*
Mullet	*Mugil spp.*
Northern puffer	*Sphoeroides maculatus*
Northern searobin	*Prionotus carolinus*
Northern stargazer	*Astroscopus guttatus*
Pigfish	*Orthopristis chrysoptera*
Pinfish	*Lagodon rhomboides*
Pipefish	*Syngnathus spp.*
Red drum	*Sciaenops ocellatus*
Red hake	*Urophycis chuss*
Redfin pickerel	*Esox americanus americanus*
Sand tiger shark	*Carcharias taurus*
Sandbar shark	*Carcharhinus plumbeus*
Scalloped hammerhead	*Sphyrna lewini*
Sheepshead	*Archosargus probatocephalus*
Shorthead redhorse	*Moxostoma macrolepidotum*
Shortnose sturgeon	*Acipenser brevirostrum*
Silver hake	*Merluccius bilinearis*
Silversides	-
Smallmouth bass	*Micropterus dolomieu*
Smooth butterfly ray	*Gymnura micrura*
Smooth dogfish	*Mustelus canis*
Southern flounder	*Paralichthys lethostigma*
Southern stingray	*Dasyatis americana*
Spanish mackerel	*Scomberomorus maculatus*
Spinner shark	*Carcharhinus brevipinna*
Spiny dogfish	*Squalus acanthias*
Spot	*Leiostomus xanthurus*
Spotfin shiner	*Cyprinella spiloptera*
Spottail shiner	*Notropis hudsonius*
Spotted hake	*Urophycis regia*
Spotted seatrout	*Cynoscion nebulosus*
Striped bass	*Morone saxatilis*

SPECIES LIST

Common Name	Scientific Name
FISH, cont.	
Striped burrfish	*Cyclichthys schoepfi*
Striped cusk-eel	*Ophidion marginatum*
Summer flounder	*Paralichthys dentatus*
Sunfish	*Lepomis spp.*
Tautog	*Tautoga onitis*
Tessellated darter	*Etheostoma olmstedi*
Thresher shark	*Alopias vulpinus*
Walleye	*Stizostedion vitreum vitreum*
Weakfish	*Cynoscion regalis*
White crappie	*Pomoxis annularis*
White perch	*Morone americana*
Winter flounder	*Pleuronectes americanus*
Yellow perch	*Perca flavescens*
HABITATS	
PLANT	
Endangered plant	-
Rare plant community	-
Threatened plant	-
WETLAND	
Seabeach amaranth	*Amaranthus pumilus*
Sensitive joint-vetch	*Aeschynomene virginica*
HERPETOFAUNA	
AMPHIBIAN	
Barking treefrog	*Hyla gratiosa*
TURTLE	
Chicken turtle	*Deirochelys reticularia*
Diamondback terrapin	*Malaclemys terrapin*
Green sea turtle	*Chelonia mydas*
Kemp's ridley sea turtle	*Lepidochelys kempii*
Leatherback sea turtle	*Dermochelys coriacea*
Loggerhead sea turtle	*Caretta caretta*
Snapping turtle	*Chelydra serpentine*

Common Name	Scientific Name
INVERTEBRATES	
BIVALVE	
Alewife floater	*Anodonta implicata*
Atlantic surfclam	*Spisula solidissima*
Bay scallop	*Argopecten irradians*
Carolina slabshell	*Elliptio congaraea*
BIVALVE	
Carolina spike	*Elliptio raveneli*
Creeper	*Strophitus undulatus*
Dwarf wedgemussel	*Alasmidonta heterodon*
Eastern elliptio	*Elliptio complanata*
Eastern floater	*Pyganodon cataracta*
Eastern lampmussel	*Lampsilis radiata*
Eastern oyster	*Crassostrea virginica*
Eastern pondmussel	*Ligumia nasuta*
Elliptio complex	*Elliptio sp.*
Hard clam	*Mercenaria mercenaria*
Northern lance	*Elliptio fisheriana*
Paper pondshell	*Utterbackia imbecillis*
Softshell clam	*Mya arenaria*
Stout razor clam	*Tagelus plebeius*
Tidewater mucket	*Leptodea ochracea*
Triangle floater	*Alasmidonta undulata*
Variable spike	*Elliptio icterina*
Yellow lampmussel	*Lampsilis cariosa*
CEPHALOPOD	
Squid	*Loligo spp.*
CRAB	
Atlantic rock crab	*Cancer irroratus*
Blue crab	*Callinectes sapidus*
Hermit crab	*Pagurus spp.*
Horseshoe crab	*Limulus polyphemus*
Lady crab	*Ovalipes ocellatus*
Knobbed whelk	*Busycon carica*
Darkling beetle	*Schoenicus puberulus*
Federally threatened insect 1	-
Federally threatened insect 2	-

SPECIES LIST

Common Name	Scientific Name
INVERTEBRATES, cont.	
Helops darkling beetle	*Helops cisteloides*
Little white tiger beetle	*Ellipsoptera lepida*
Monarch butterfly	*Danaus plexippus*
Northeastern beach tiger beetle	*Cicindela dorsalis dorsalis*
Palamedes swallowtail	*Papilio palamedes*
Selys' sunfly	*Helocordulia selysii*
BIVALVE	
White tiger beetle	*Habroscelimorpha dorsalis media*
LOBSTER	
American lobster	*Homarus americanus*
SHRIMP	
Brown shrimp	*Farfantepenaeus aztecus*
Grass shrimp	*Palaemonetes spp.*
Mantis shrimp	*Squilla empusa*
Sand shrimp	*Crangon septemspinosa*
White shrimp	*Litopenaeus setiferus*
MARINE MAMMALS	
DOLPHIN	
Bottlenose dolphin	*Tursiops truncatus*
Harbor porpoise	*Phocoena phocoena*
Short-beaked common dolphin	*Delphinus delphis*
MANATEE	
West Indian manatee	*Trichechus manatus*
PINNIPED	
Gray seal	*Halichoerus grypus*
Harbor seal	*Phoca vitulina*
WHALE	
Fin whale	*Balaenoptera physalus*
Humpback whale	*Megaptera novaeangliae*
North Atlantic right whale	*Eubalaena glacialis*

Common Name	Scientific Name
TERRESTRIAL MAMMALS	
BAT	
Rafinesque's eastern big-eared bat	*Corynorhinus rafinesquii macrotis*
SMALL MAMMAL	
Delmarva fox squirrel	*Sciurus niger cinereus*
Dismal swamp southeastern shrew	*Sorex longirostris fisheri*
Northern river otter	*Lontra canadensis*
UNGULATE	
Horse	*Equus caballus*

* 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

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

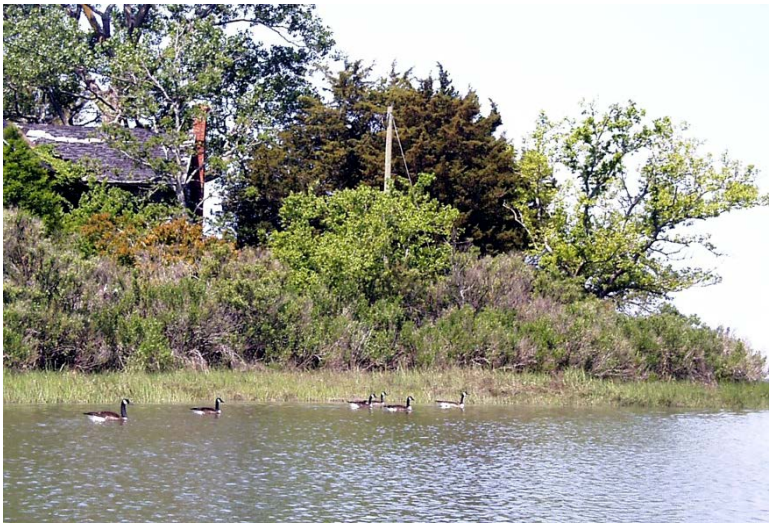
RESPONSE CONSIDERATIONS

- 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

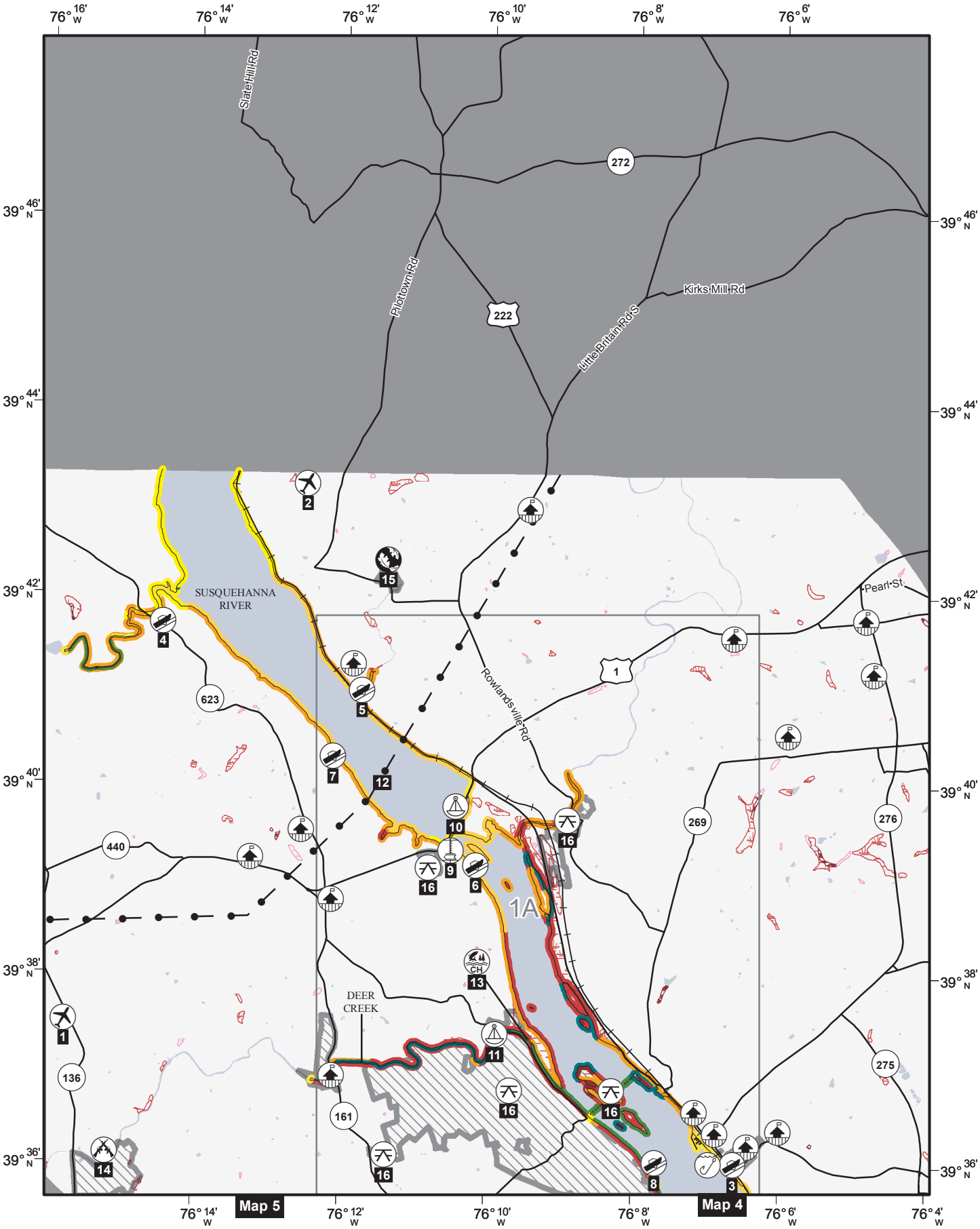
PREDICTED OIL BEHAVIOR

- 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 1

Chesapeake North

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

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Map 1
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	AIRPORT	MOXLEY'S		
2	AIRPORT	PEMBROKE FARM		
3	BOAT RAMP	BOAT RAMP		
4	BOAT RAMP	BROAD CREEK PUBLIC LANDING	HARFORD COUNTY - DEPT. OF PARKS AND REC.	
5	BOAT RAMP	CONOWINGO CREEK LANDING	EXELON CORPORATION	
6	BOAT RAMP	FISHERMAN'S PARK/SHURESVILLE LANDING	EXELON CORPORATION	
7	BOAT RAMP	GLEN COVE - EXELON	EXELON CORPORATION	
8	BOAT RAMP	SUSQUEHANNA STATE PARK - LAPIDUM	MARYLAND DNR - PARK SERVICE	
9	LOCK AND DAM	CONOWINGO		
10	REPEATED MEASUREMENT SITE	WQ - STATION CB1.0	CHESAPEAKE BAY PROGRAM	800-968-7229
11	REPEATED MEASUREMENT SITE	WQ - STATION DER0015	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (LINES)

Map ID	Type	Name	Contact	Phone
12	PIPELINE	PIPELINE		

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
13	CRITICAL HABITAT	MARYLAND DARTER CRITICAL HABITAT	USFWS, NORTHEAST REGION	
14	MILITARY	ABERDEEN PROVING GROUND		
15	NATURE CONSERVANCY	PILOT SERPENTINE BARRENS FEE	THE NATURE CONSERVANCY	703-841-5300
16	PARK	SUSQUEHANNA SP	MARYLAND PARK SERVICE	

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
ESSENTIAL HABITAT	FEDERALLY THREATENED AND STATE THREATENED SPECIES		
ESSENTIAL HABITAT	STATE ENDANGERED SPECIES		
ESSENTIAL HABITAT	STATE THREATENED SPECIES		

JURISDICTIONS

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10B	Freshwater Marshes	59.18	0.09
10C	Swamps	686.02	1.07
10D	Scrub and Shrub Wetlands	38.53	0.06

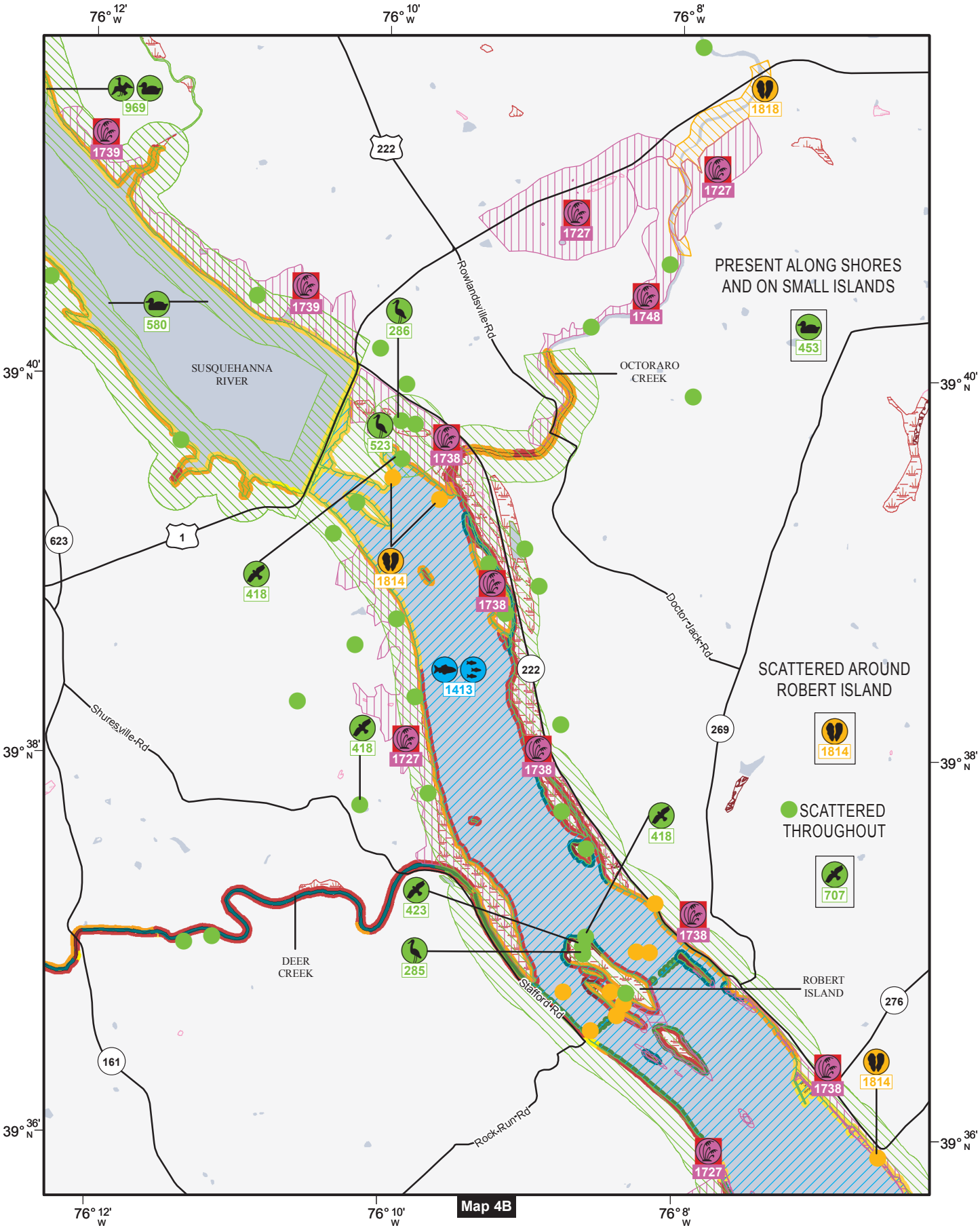
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10C	Swamps	34,411.51	21.38	23%
10D	Scrub and Shrub Wetlands	2,223.50	1.38	2%
9A	Sheltered Tidal Flats	2,551.34	1.59	2%
9B	Vegetated Low Banks	43,500.38	27.03	30%
8A	Sheltered Scarps (Bedrock/Mud/Clay)	9,601.99	5.97	7%
8B	Sheltered, Solid Man-Made Structures	7,006.51	4.35	5%
8C	Sheltered Riprap	4,314.69	2.68	3%
8D	Sheltered, Rocky, Rubble Shores	15,892.88	9.88	11%
6A	Gravel Beaches	16,994.25	10.56	12%
6D	Boulder Rubble	10,456.03	6.50	7%

Total ESI Shoreline:	146,953.09	Total ESI Shoreline:	91.31
Total Shoreline:	91,404.65	Total Shoreline:	56.80

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 1A

Chesapeake North

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

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Map 1A
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
285	Wading	Great blue heron	Nesting			43 Nests													Feb-Jun	-	-	-	-
286	Wading	Great blue heron	Nesting			620 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
423	Raptor	Bald eagle	Nesting			Last Obs. 2000													Feb-Apr	-	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
523	Wading	Great blue heron	Nesting			620 Pairs													Feb-Jun	-	-	-	-
580	Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			Present													-	-	-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
969	Diving	Grebes	Wintering			Present													-	-	-	-	-
	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			10,000S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1413	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
1738	Plant	Endangered plant	Vulnerable Occurrence	E/-		3 Species Present													-	-	-	-	-
1739	Plant	Endangered plant	Vulnerable Occurrence	E/-		3 Species Present													-	-	-	-	-
	Plant	Threatened plant	Vulnerable Occurrence	T/-		-													-	-	-	-	-
1748	Plant	Endangered plant	Vulnerable Occurrence	E/-		2 Species Present													-	-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1814	Bivalve	Eastern elliptio	Vulnerable Occurrence			-													-	-	-	Jan-Dec	Jan-Dec
1818	Bivalve	Creeper	Vulnerable Occurrence			-													-	-	-	Jan-Dec	Jan-Dec

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	American coot	Wintering			1,000S													-	-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-	-
	Mallard	Wintering			1,000S													-	-	-	-	-
	Wood duck	Wintering			Present													-	-	-	-	-

FISH

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	White perch													-	-	-	Jan-Dec	Jan-Dec
Freshwater	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Chesapeake logperch													Apr-Jun	-	-	-	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	Walleye													Mar-May	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10B	Freshwater Marshes	14.30	0.02
10C	Swamps	491.96	0.77
10D	Scrub and Shrub Wetlands	21.44	0.03

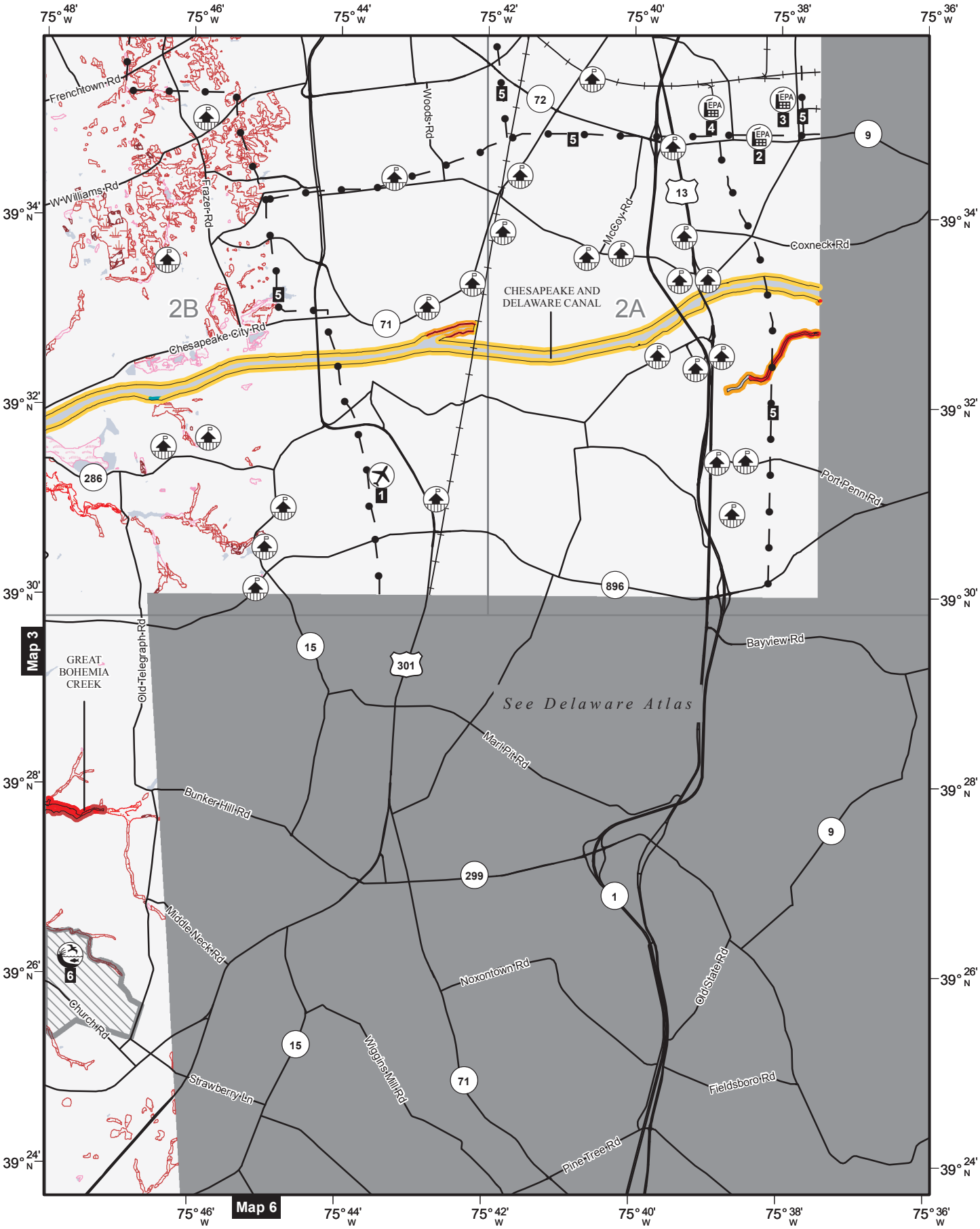
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10C	Swamps	34,277.95	21.30	31%
10D	Scrub and Shrub Wetlands	2,223.50	1.38	2%
9A	Sheltered Tidal Flats	1,295.44	0.80	1%
9B	Vegetated Low Banks	30,089.10	18.70	27%
8A	Sheltered Scarps (Bedrock/Mud/Clay)	588.30	0.37	1%
8B	Sheltered, Solid Man-Made Structures	5,540.97	3.44	5%
8C	Sheltered Riprap	4,263.71	2.65	4%
8D	Sheltered, Rocky, Rubble Shores	10,846.12	6.74	10%
6A	Gravel Beaches	16,647.60	10.34	15%
6D	Boulder Rubble	6,126.53	3.81	5%

Total ESI Shoreline:	111,899.22	Total ESI Shoreline:	69.53
Total Shoreline:	69,708.43	Total Shoreline:	43.31

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 2

Chesapeake North

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

N

Map 2
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	AIRPORT	SUMMIT		
2	EPA FACILITY	AIR LIQUIDE DELAWARE CITY, DE CO2 PLANT	PLANT MANAGER	302-834-7404
3	EPA FACILITY	DELAWARE CITY REFINING COMPANY, LLC	REFINERY SHIFT SUPERINTENDENT	302-834-6000
4	EPA FACILITY	FORMOSA PLASTICS CORPORATION, DELAWARE	EHS MANAGER	302-836-2256

DISPLAYED ON MAP (LINES)

Map ID	Type	Name	Contact	Phone
5	PIPELINE	PIPELINE		

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
6	MANAGEMENT AREA	OLD BOHEMIA WMA	WILDLIFE AND HERITAGE SERVICE	

JURISDICTIONS

COUNTY:	CECIL COUNTY, NEW CASTLE COUNTY	***FEMA:***	REGION I
COAST GUARD:	DISTRICT 5, SECTOR BALTIMORE, SECTOR DELAWARE BAY	***EPA:***	REGION 3
USACE:	NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT, PHILADELPHIA DISTRICT		

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	93.16	0.15
10B	Freshwater Marshes	305.02	0.48
10C	Swamps	1,260.67	1.97
10D	Scrub and Shrub Wetlands	69.07	0.11

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	9,670.22	6.01	19%
10C	Swamps	1,360.13	0.85	3%
9A	Sheltered Tidal Flats	1,604.39	1.00	3%
9B	Vegetated Low Banks	6,705.97	4.17	13%
8B	Sheltered, Solid Man-Made Structures	331.89	0.21	1%
8C	Sheltered Riprap	31,456.49	19.55	61%
5	Mixed Sand and Gravel Beaches	237.00	0.15	< 1%

Total ESI Shoreline:	51,366.08	Total ESI Shoreline:	31.92
Total Shoreline:	41,475.88	Total Shoreline:	25.77

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

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

Map 2A

Chesapeake North

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

N

Map 2A
Chesapeake North

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

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1575	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

	Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	American eel													-	-	-	Jan-May	Jan-Dec
		Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
		Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
		White perch													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Freshwater	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
		Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
		Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
		Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
		Spottail shiner													May-Aug	-	-	-	Jan-Dec
		Sunfish													Mar-Jul	-	-	-	Jan-Dec
		Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
		White crappie													-	-	-	-	Jan-Dec
		Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)

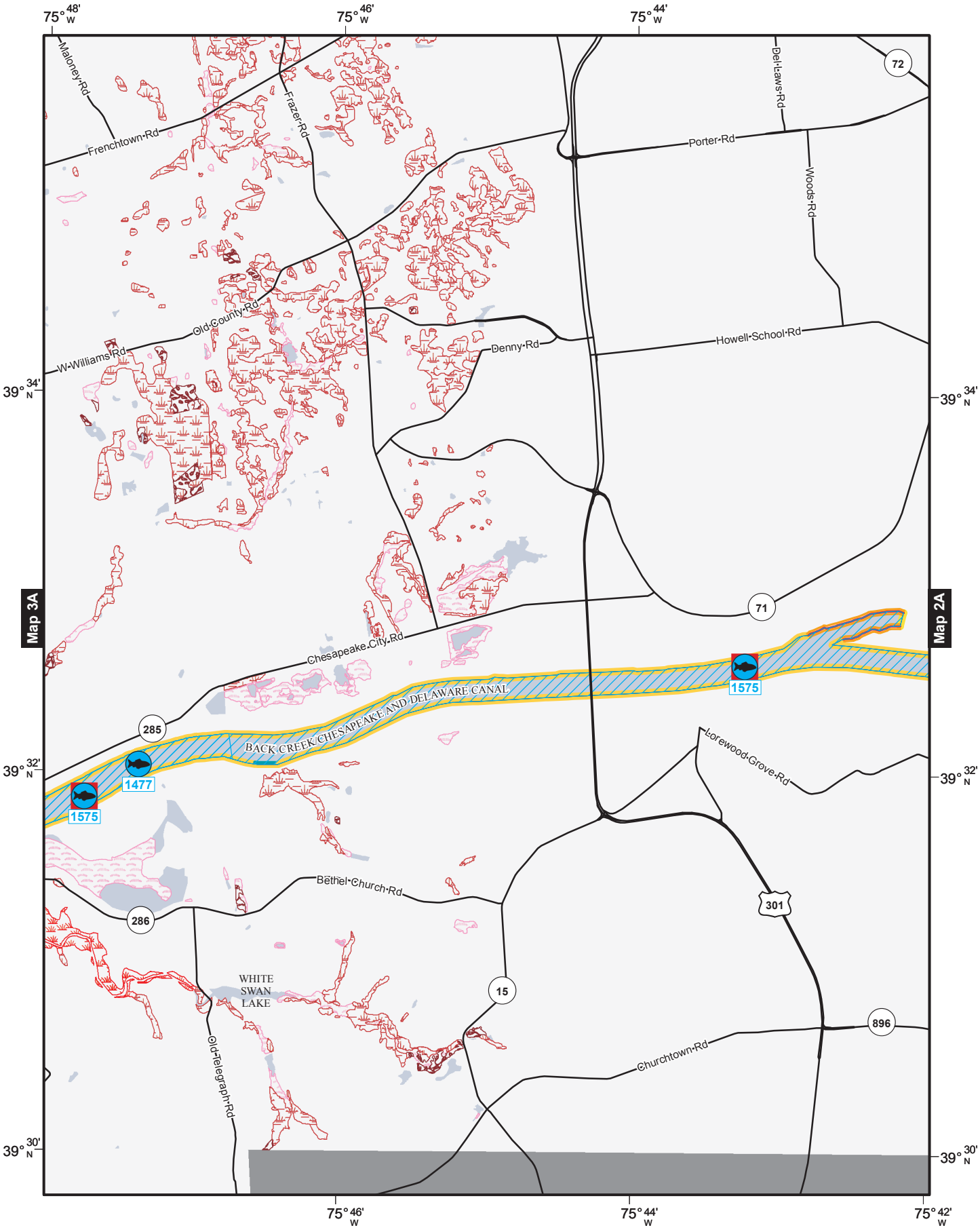
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	5,101.58	3.17	21%
9B	Vegetated Low Banks	5,101.58	3.17	21%
8B	Sheltered, Solid Man-Made Structures	194.68	0.12	1%
8C	Sheltered Riprap	13,718.14	8.52	57%

Total ESI Shoreline:	24,115.98	Total ESI Shoreline:	14.98
Total Shoreline:	19,014.40	Total Shoreline:	11.81

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 2B

Chesapeake North

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

N

Map 2B
Chesapeake North

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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1477	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
1575	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

Subelement	Species	Monthly Presence (J F M A M J J A S O N D)	Spawn	Eggs	Larvae	Juveniles	Adults
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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	54.01	0.08
10B	Freshwater Marshes	300.91	0.47
10C	Swamps	1,092.39	1.71
10D	Scrub and Shrub Wetlands	66.11	0.10

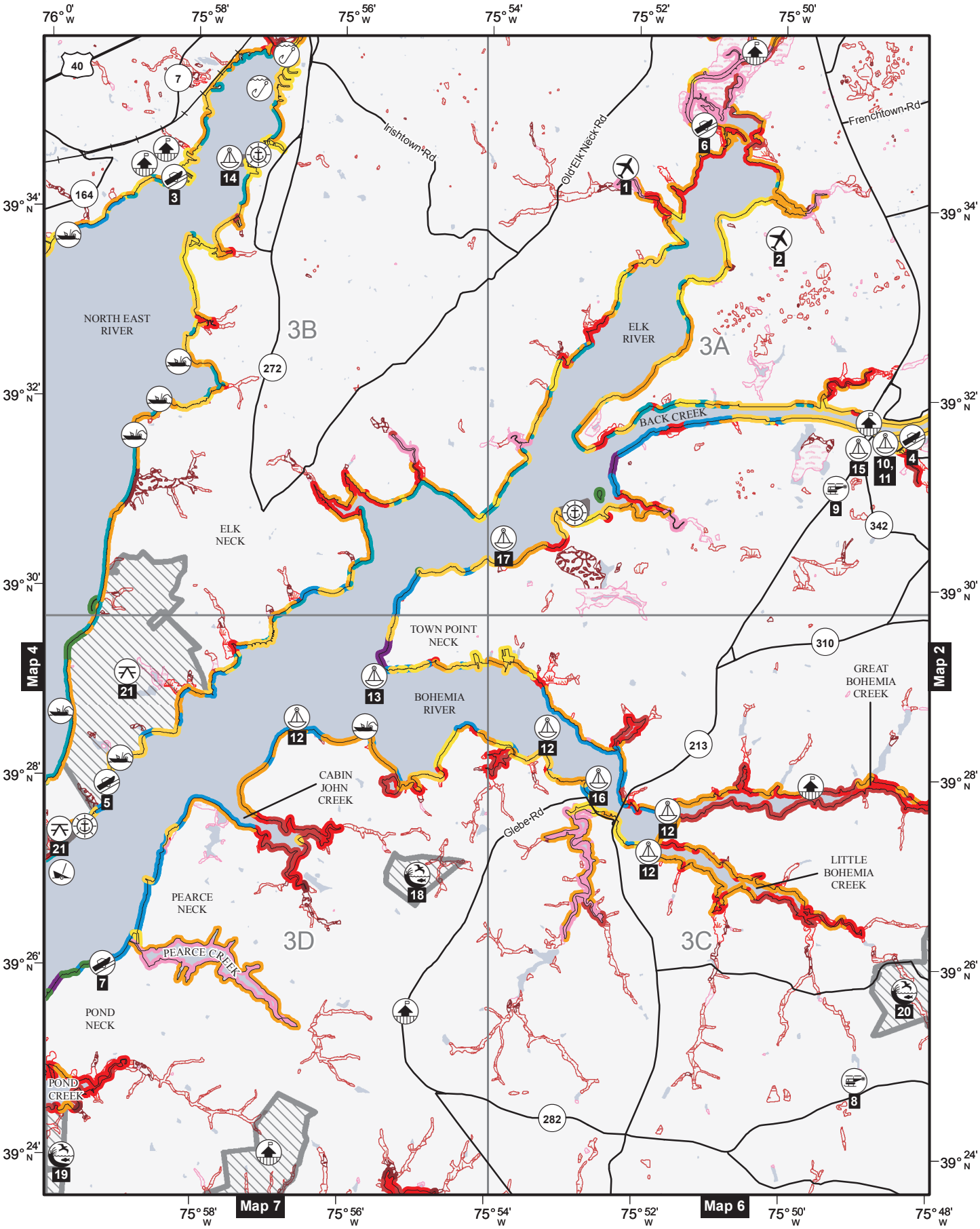
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	1,604.39	1.00	7%
9A	Sheltered Tidal Flats	1,604.39	1.00	7%
9B	Vegetated Low Banks	1,604.39	1.00	7%
8B	Sheltered, Solid Man-Made Structures	137.21	0.09	1%
8C	Sheltered Riprap	17,738.35	11.02	77%
5	Mixed Sand and Gravel Beaches	237.00	0.15	1%

Total ESI Shoreline:	22,925.73	Total ESI Shoreline:	14.25
Total Shoreline:	19,479.95	Total Shoreline:	12.10

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 3

Chesapeake North

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

N

Map 3
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	AIRPORT	CECIL COUNTY		
2	AIRPORT	KNOLLWOOD FARM		
3	BOAT RAMP	CHARLESTOWN - PUBLIC BOAT RAMP	TOWN OF CHARLESTOWN	
4	BOAT RAMP	CHESAPEAKE CITY	U.S. ARMY CORPS OF ENGINEERS	
5	BOAT RAMP	ELK NECK STATE PARK - ROGUES HARBOR	MARYLAND DNR - PARK SERVICE	
6	BOAT RAMP	ELK RIVER PARK	CECIL COUNTY - DEPT. OF PARKS AND RECREATION	
7	BOAT RAMP	STEMMER'S RUN BOAT LAUNCHING RAMP	CECIL COUNTY - DEPT. OF PARKS AND RECREATION	
8	HELIPORT	BRIDGETON		
9	HELIPORT	CHESAPEAKE CITY		
10	REPEATED MEASUREMENT SITE	DB - NOS, 8573927 - CHESAPEAKE CITY, MD	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
11	REPEATED MEASUREMENT SITE	PORTS - CHESAPEAKE CITY ROUTE 213 BRIDGE	PORTS PROGRAM	301-713-4392
12	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, BOHEMIA RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
13	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, ELK RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
14	REPEATED MEASUREMENT SITE	WQ - STATION ET1.1	CHESAPEAKE BAY PROGRAM	800-968-7229
15	REPEATED MEASUREMENT SITE	WQ - STATION ET2.1	CHESAPEAKE BAY PROGRAM	800-968-7229
16	REPEATED MEASUREMENT SITE	WQ - STATION ET2.2	CHESAPEAKE BAY PROGRAM	800-968-7229
17	REPEATED MEASUREMENT SITE	WQ - STATION ET2.3	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
18	MANAGEMENT AREA	EARLEVILLE WMA	WILDLIFE AND HERITAGE SERVICE	
19	MANAGEMENT AREA	GROVE FARM WMA	WILDLIFE AND HERITAGE SERVICE	
20	MANAGEMENT AREA	OLD BOHEMIA WMA	WILDLIFE AND HERITAGE SERVICE	
21	PARK	ELK NECK SP	MARYLAND PARK SERVICE	

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
ESSENTIAL HABITAT	FEDERALLY THREATENED AND STATE ENDANGERED SPECIES		
STATE PROTECTED AREA	ELK NECK SF	MARYLAND FOREST SERVICE	

JURISDICTIONS

COUNTY: CECIL COUNTY
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT, PHILADELPHIA 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	743.67	1.16
10B	Freshwater Marshes	892.83	1.40
10C	Swamps	1,628.14	2.54
10D	Scrub and Shrub Wetlands	499.40	0.78
9A	Sheltered Tidal Flats	4.35	0.01

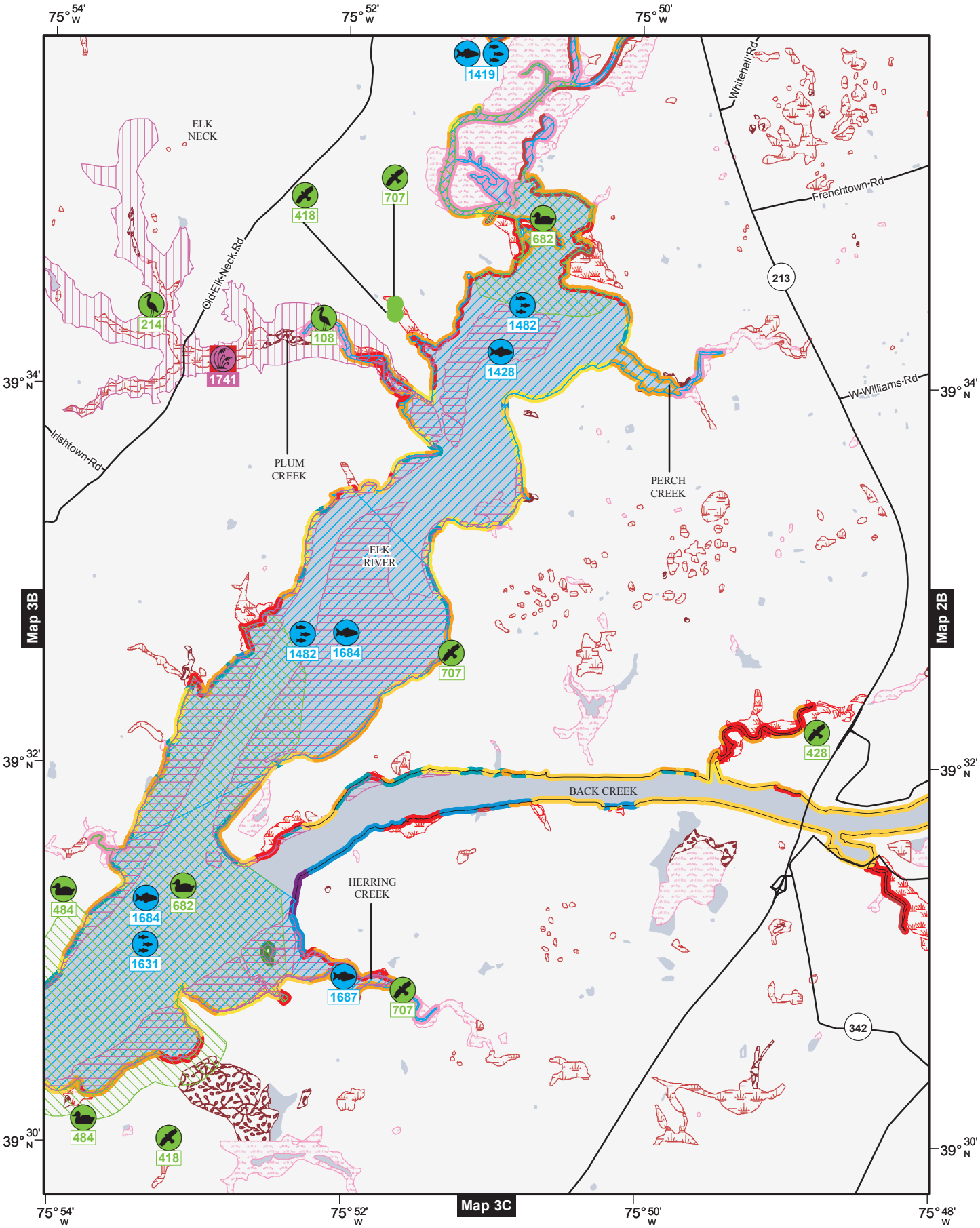
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	66,448.46	41.29	20%
10B	Freshwater Marshes	43,930.60	27.30	13%
10C	Swamps	22,111.60	13.74	7%
10D	Scrub and Shrub Wetlands	3,746.60	2.33	1%
9A	Sheltered Tidal Flats	6,450.43	4.01	2%
9B	Vegetated Low Banks	82,572.21	51.31	24%
8B	Sheltered, Solid Man-Made Structures	28,904.66	17.96	9%
8C	Sheltered Riprap	33,129.58	20.59	10%
6B	Riprap	2,819.39	1.75	1%
5	Mixed Sand and Gravel Beaches	24,834.66	15.43	7%
4	Coarse Grained Sand Beaches	22,597.09	14.04	7%
3B	Scarps and Steep Slopes (Sand)	87.94	0.05	< 1%
1B	Exposed, Solid Man-Made Structures	1,760.76	1.09	1%

Total ESI Shoreline:	339,393.97	Total ESI Shoreline:	210.89
Total Shoreline:	253,982.11	Total Shoreline:	157.82

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 3A

Chesapeake North

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

N

Map 3A
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
108	Wading	Great blue heron	Nesting			6 Nests													Feb-Jun	-	-	-	-
214	Wading	Great blue heron	Nesting			45 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
428	Raptor	Bald eagle	Nesting			Last Obs. 2005													Feb-Apr	-	-	-	-
484	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
682	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1419	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
1428	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	-

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	Blueback herring	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
1482	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
1631	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
1684	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
1687	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1741	Plant	Threatened plant	Vulnerable Occurrence	T/-		-													-	-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
		American black duck	Wintering			100S													-	-	-	-	-
		American coot	Wintering			100S													-	-	-	-	-
		American wigeon	Wintering			10S													-	-	-	-	-
		Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
		Gadwall	Wintering			100S													-	-	-	-	-
		Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
		Mallard	Wintering			1,000S													-	-	-	-	-

FISH

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	224.44	0.35
10B	Freshwater Marshes	691.39	1.08
10C	Swamps	471.60	0.74
10D	Scrub and Shrub Wetlands	174.92	0.27
9A	Sheltered Tidal Flats	4.35	0.01

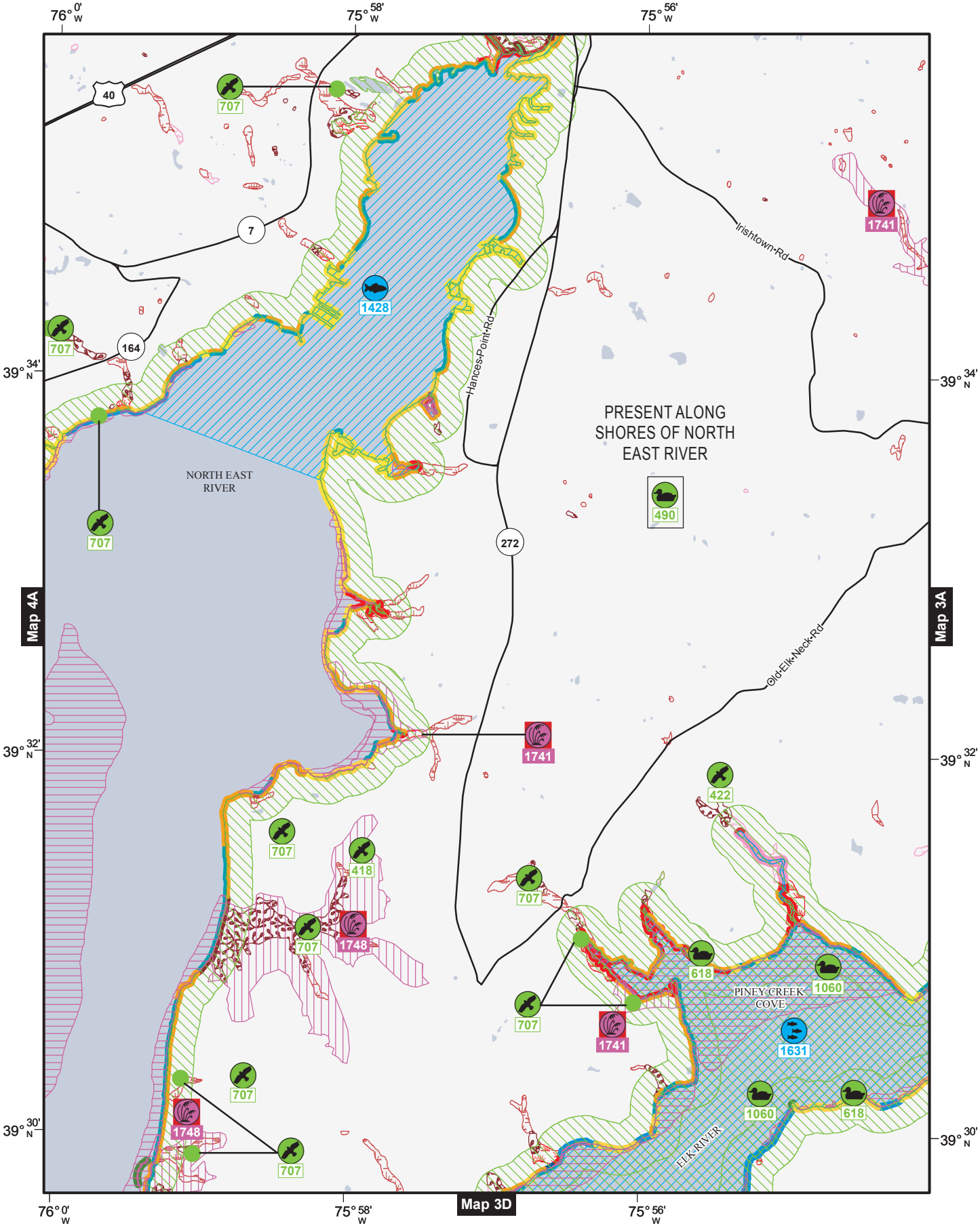
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	19,901.19	12.37	20%
10B	Freshwater Marshes	18,873.45	11.73	19%
10C	Swamps	4,640.38	2.88	5%
10D	Scrub and Shrub Wetlands	433.46	0.27	< 1%
9A	Sheltered Tidal Flats	4,906.24	3.05	5%
9B	Vegetated Low Banks	21,197.20	13.17	21%
8B	Sheltered, Solid Man-Made Structures	8,637.79	5.37	8%
8C	Sheltered Riprap	13,299.92	8.26	13%
6B	Riprap	358.80	0.22	< 1%
5	Mixed Sand and Gravel Beaches	6,045.70	3.76	6%
4	Coarse Grained Sand Beaches	2,911.22	1.81	3%
1B	Exposed, Solid Man-Made Structures	525.97	0.33	1%

Total ESI Shoreline:	101,731.31	Total ESI Shoreline:	63.21
Total Shoreline:	77,289.02	Total Shoreline:	48.03

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 3B

Chesapeake North

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

N

Map 3B
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-	-
490	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
618	Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
	Waterfowl	American coot	Wintering			100S													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			10S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1060	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1428	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
1631	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1741	Plant	Threatened plant	Vulnerable Occurrence	**T/-**		-													-	-	-	-	-
1748	Plant	Endangered plant	Vulnerable Occurrence	**E/-**		2 Species Present													-	-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

FISH

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Chesapeake logperch													Apr-Jun	-	-	-	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

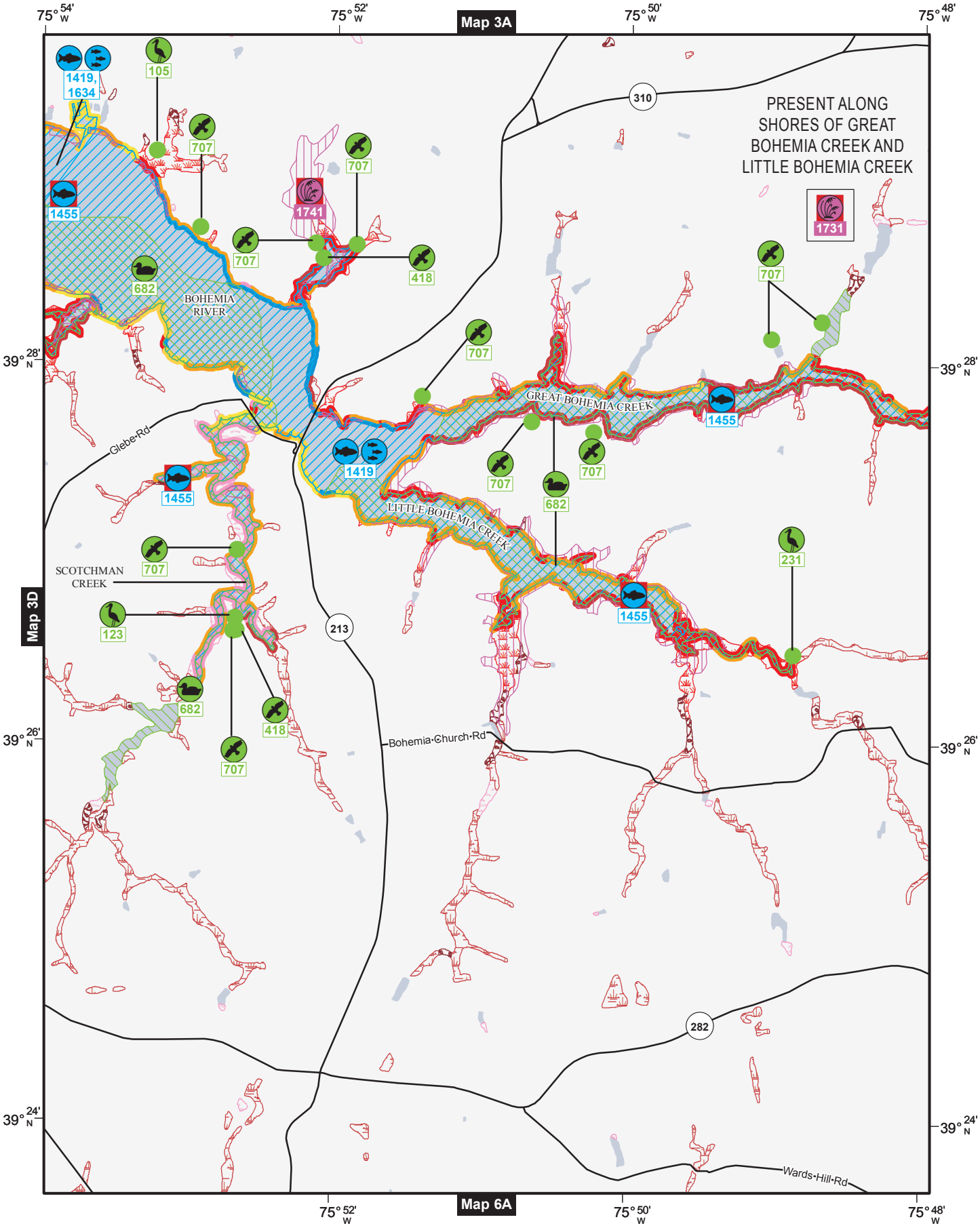
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	75.39	0.12
10B	Freshwater Marshes	31.90	0.05
10C	Swamps	218.15	0.34
10D	Scrub and Shrub Wetlands	178.91	0.28

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	8,571.60	5.33	12%
10B	Freshwater Marshes	1,644.25	1.02	2%
10C	Swamps	1,609.62	1.00	2%
10D	Scrub and Shrub Wetlands	1,321.91	0.82	2%
9A	Sheltered Tidal Flats	1,155.11	0.72	2%
9B	Vegetated Low Banks	18,285.34	11.36	25%
8B	Sheltered, Solid Man-Made Structures	13,035.48	8.10	18%
8C	Sheltered Riprap	10,412.20	6.47	14%
6B	Riprap	634.34	0.39	1%
5	Mixed Sand and Gravel Beaches	13,676.60	8.50	19%
4	Coarse Grained Sand Beaches	3,399.87	2.11	5%
3B	Scarps and Steep Slopes (Sand)	87.94	0.05	< 1%
	Total ESI Shoreline:	73,834.26	Total ESI Shoreline:	45.88
	Total Shoreline:	53,167.30	Total Shoreline:	33.04

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 3C

Chesapeake North

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

N

Map 3C
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D	Nest	Mig.(S)	Mig.(F)	Molt	
105	Wading	Great blue heron	Nesting			13 Nests		Feb-Jun	-	-	-	-
123	Wading	Great blue heron	Nesting			14 Nests		Feb-Jun	-	-	-	-
231	Wading	Great blue heron	Nesting			29 Nests		Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004		Feb-Apr	-	-	-	-
682	Waterfowl	Bufflehead	Wintering			100S		-	-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S		-	-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S		-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S		-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S		-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S		-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S		-	-	-	-	-
	Waterfowl	Scaup	Wintering			1,000S		-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S		-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S		-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-		-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D	Spawn	Eggs	Larvae	Juveniles	Adults
1419	Diadromous	Alewife	Nursery Area			-		-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-		Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			-		-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-		Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-		-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-		Apr-May	Apr-May	-	-	Feb-Jun
	Estuarine Nursery	White perch	Spawning Area			-		Mar-May	Mar-May	Apr-Jun	-	Mar-May
1455	Diadromous	American shad	Nursery Area			-		-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-		Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-		-	-	-	-	Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-		-	-	-	Jan-Dec	Jan-Dec

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1634	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1731	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
	Plant	Threatened plant	Vulnerable Occurrence	T/-		3 Species Present													-	-	-	-	-
1741	Plant	Threatened plant	Vulnerable Occurrence	T/-		-													-	-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
		American coot	Wintering			100S													-	-	-	-	-
		American wigeon	Wintering			10S													-	-	-	-	-
		Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
		Gadwall	Wintering			100S													-	-	-	-	-
		Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
		Mallard	Wintering			1,000S													-	-	-	-	-
		Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	236.96	0.37
10B	Freshwater Marshes	89.76	0.14
10C	Swamps	523.31	0.82
10D	Scrub and Shrub Wetlands	47.64	0.07

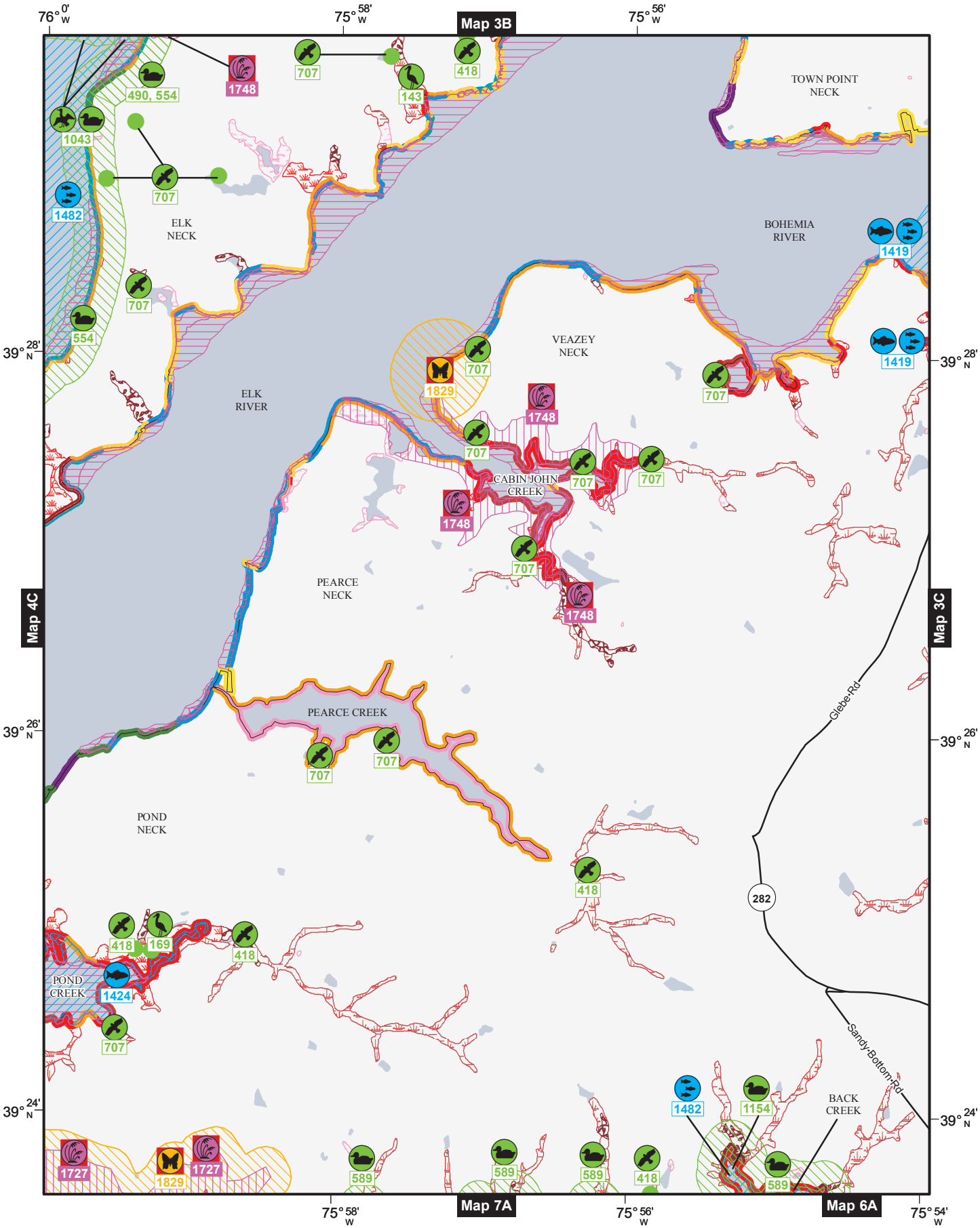
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	20,707.37	12.87	28%
10B	Freshwater Marshes	11,176.63	6.94	15%
10C	Swamps	11,096.36	6.89	15%
10D	Scrub and Shrub Wetlands	157.70	0.10	< 1%
9B	Vegetated Low Banks	19,342.59	12.02	26%
8B	Sheltered, Solid Man-Made Structures	4,326.11	2.69	6%
8C	Sheltered Riprap	1,933.57	1.20	3%
4	Coarse Grained Sand Beaches	4,785.14	2.97	7%

Total ESI Shoreline:	73,525.48	Total ESI Shoreline:	45.69
Total Shoreline:	58,161.84	Total Shoreline:	36.14

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 3D

Chesapeake North

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

N

Map 3D
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
143	Wading	Great blue heron	Nesting			7 Nests													Feb-Jun	-	-	-	-
169	Wading	Great blue heron	Nesting			15 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
490	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
554	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American coot	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Wood duck	Wintering			Present													-	-	-	-	-
589	Waterfowl	American wigeon	Wintering			100S													-	-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-	-
	Waterfowl	Northern pintail	Wintering			100S													-	-	-	-	-
	Waterfowl	Northern shoveler	Wintering			10S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1043	Diving	Common loon	Wintering			10S													-	-	-	-	-
	Diving	D. crested cormorant	Migration			100S													-	Mar-May	Aug-Nov	-	-
	Diving	Grebes	Wintering			Present													-	-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S													-	-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			10S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scoters	Wintering			Present													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			1,000S													-	-	-	-	-
1154	Waterfowl	Canvasback	Wintering			100S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1419	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
1424	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
1482	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
1748	Plant	Endangered plant	Vulnerable Occurrence	E/-		2 Species Present													-	-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1829	Insect	Federally threatened insect 2	Vulnerable Occurrence	E/-	T	-													Jun-Aug	Jun-Jul	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
		American coot	Wintering			100S													-	-	-	-	-
		American wigeon	Wintering			10S													-	-	-	-	-
		Bufflehead	Wintering			100S													-	-	-	-	-
		Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
		Canada goose	Wintering			10,000S													-	-	-	-	-
		Canvasback	Wintering			1,000S													-	-	-	-	-
		Common goldeneye	Wintering			10S													-	-	-	-	-
		Gadwall	Wintering			100S													-	-	-	-	-
		Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
		Mallard	Wintering			1,000S													-	-	-	-	-
		Mergansers	Wintering			1,000S													-	-	-	-	-
		Ring-necked duck	Wintering			100S													-	-	-	-	-
		Ruddy duck	Wintering			100S													-	-	-	-	-
		Scaup	Wintering			1,000S													-	-	-	-	-
		Snow goose	Wintering			10,000S													-	-	-	-	-
		Tundra swan	Wintering			100S													-	-	-	-	-
		Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-

FISH

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Chesapeake logperch													Apr-Jun	-	-	-	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

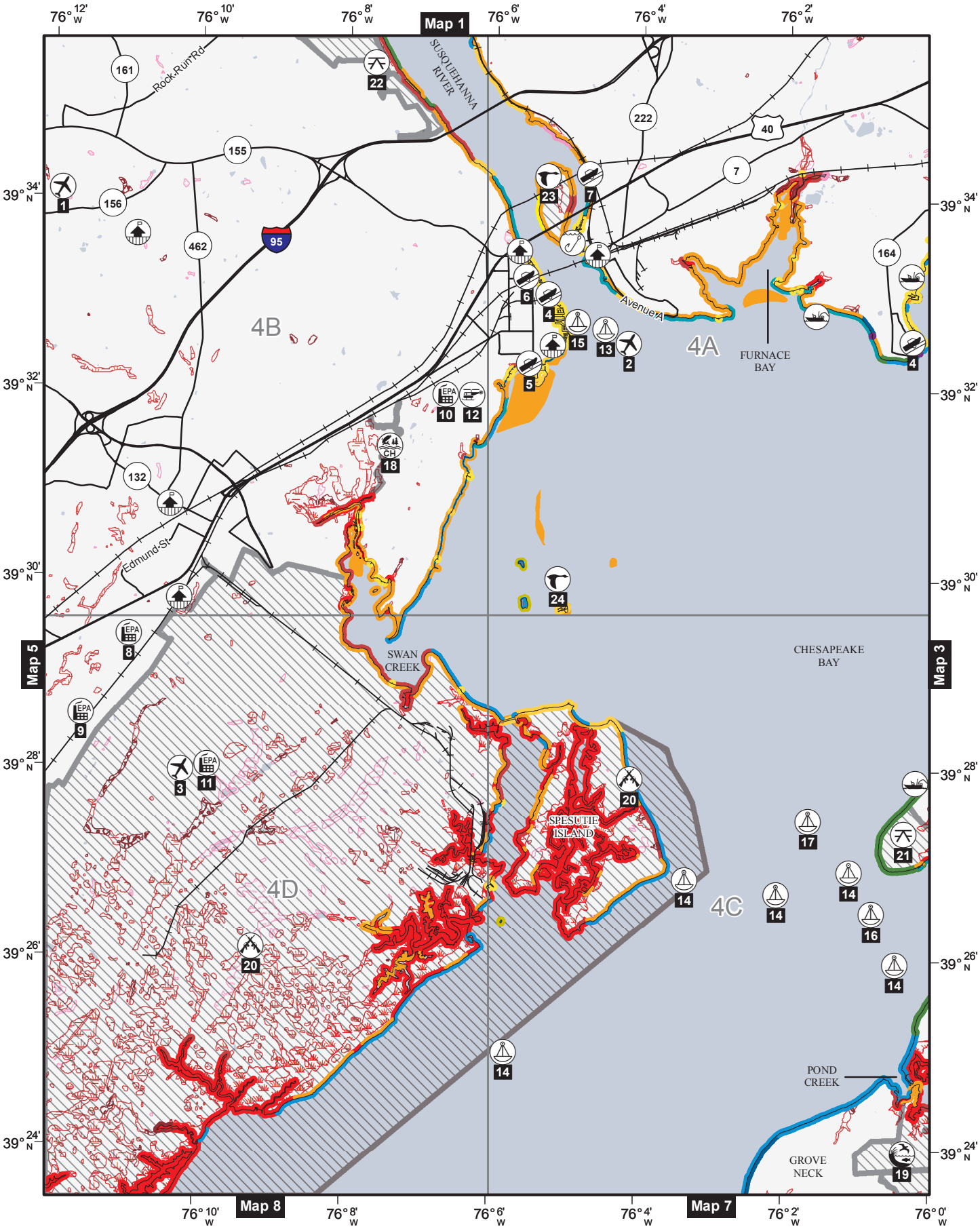
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	206.88	0.32
10B	Freshwater Marshes	79.78	0.12
10C	Swamps	415.07	0.65
10D	Scrub and Shrub Wetlands	97.93	0.15

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	17,268.30	10.73	19%
10B	Freshwater Marshes	12,236.27	7.60	14%
10C	Swamps	4,765.24	2.96	5%
10D	Scrub and Shrub Wetlands	1,833.53	1.14	2%
9A	Sheltered Tidal Flats	389.09	0.24	< 1%
9B	Vegetated Low Banks	23,747.09	14.76	26%
8B	Sheltered, Solid Man-Made Structures	2,905.28	1.81	3%
8C	Sheltered Riprap	7,483.88	4.65	8%
6B	Riprap	1,826.26	1.13	2%
5	Mixed Sand and Gravel Beaches	5,112.35	3.18	6%
4	Coarse Grained Sand Beaches	11,500.85	7.15	13%
1B	Exposed, Solid Man-Made Structures	1,234.79	0.77	1%
	Total ESI Shoreline:	90,302.92	Total ESI Shoreline:	56.11
	Total Shoreline:	65,363.96	Total Shoreline:	40.62

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

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



Map 4

Chesapeake North

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 4
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	AIRPORT	HARFORD COUNTY		
2	AIRPORT	HAVRE DE GRACE		
3	AIRPORT	PHILLIPS AAF		
4	BOAT RAMP	BOAT RAMP		
5	BOAT RAMP	CITY YACHT BASIN - HAVRE DE GRACE	CITY OF HAVRE DE GRACE - DEPT. OF PUB. WORKS	
6	BOAT RAMP	JEAN ROBERTS PARK - HAVRE DE GRACE	CITY OF HAVRE DE GRACE	
7	BOAT RAMP	PERRYVILLE - BOAT RAMP	TOWN OF PERRYVILLE	
8	EPA FACILITY	C&S WHOLESALE GROCERS - ABERDEEN	SR. DIRECTOR OF CORP. REFRIGERATION	864-234-1701
9	EPA FACILITY	GORDON FOOD SERVICE	MAINTENANCE LEAD	443-413-9339
10	EPA FACILITY	TANNER INDUSTRIES, INC.	DIR. QUALITY & REGULATORY AFFAIRS	215-322-1238
11	EPA FACILITY	U.S. ARMY GARRISON ABERDEEN PROVING GROUND	FIRE CHIEF	410-306-0501
12	HELIPORT	GREGORY MAY		
13	REPEATED MEASUREMENT SITE	DB - MOORED BUOY, SUSQUEHANNA, MD	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
14	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, CHESAPEAKE BAY	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
15	REPEATED MEASUREMENT SITE	WQ - STATION CB1.1	CHESAPEAKE BAY PROGRAM	800-968-7229
16	REPEATED MEASUREMENT SITE	WQ - STATION CB2.1	CHESAPEAKE BAY PROGRAM	800-968-7229
17	REPEATED MEASUREMENT SITE	WQ - STATION XJH6680	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
18	CRITICAL HABITAT	MARYLAND DARTER CRITICAL HABITAT	USFWS, NORTHEAST REGION	
19	MANAGEMENT AREA	GROVE FARM WMA	WILDLIFE AND HERITAGE SERVICE	
20	MILITARY	ABERDEEN PROVING GROUND		
21	PARK	ELK NECK SP	MARYLAND PARK SERVICE	
22	PARK	SUSQUEHANNA SP	MARYLAND PARK SERVICE	
23	WILDLIFE REFUGE	BLACKWATER NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE	410-228-2677
24	WILDLIFE REFUGE	SUSQUEHANNA NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE	410-228-2692

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
ESSENTIAL HABITAT	FEDERALLY THREATENED AND STATE ENDANGERED SPECIES		

JURISDICTIONS

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	2,466.99	3.85
10B	Freshwater Marshes	567.56	0.89
10C	Swamps	2,612.60	4.08
10D	Scrub and Shrub Wetlands	238.07	0.37
9A	Sheltered Tidal Flats	350.13	0.55

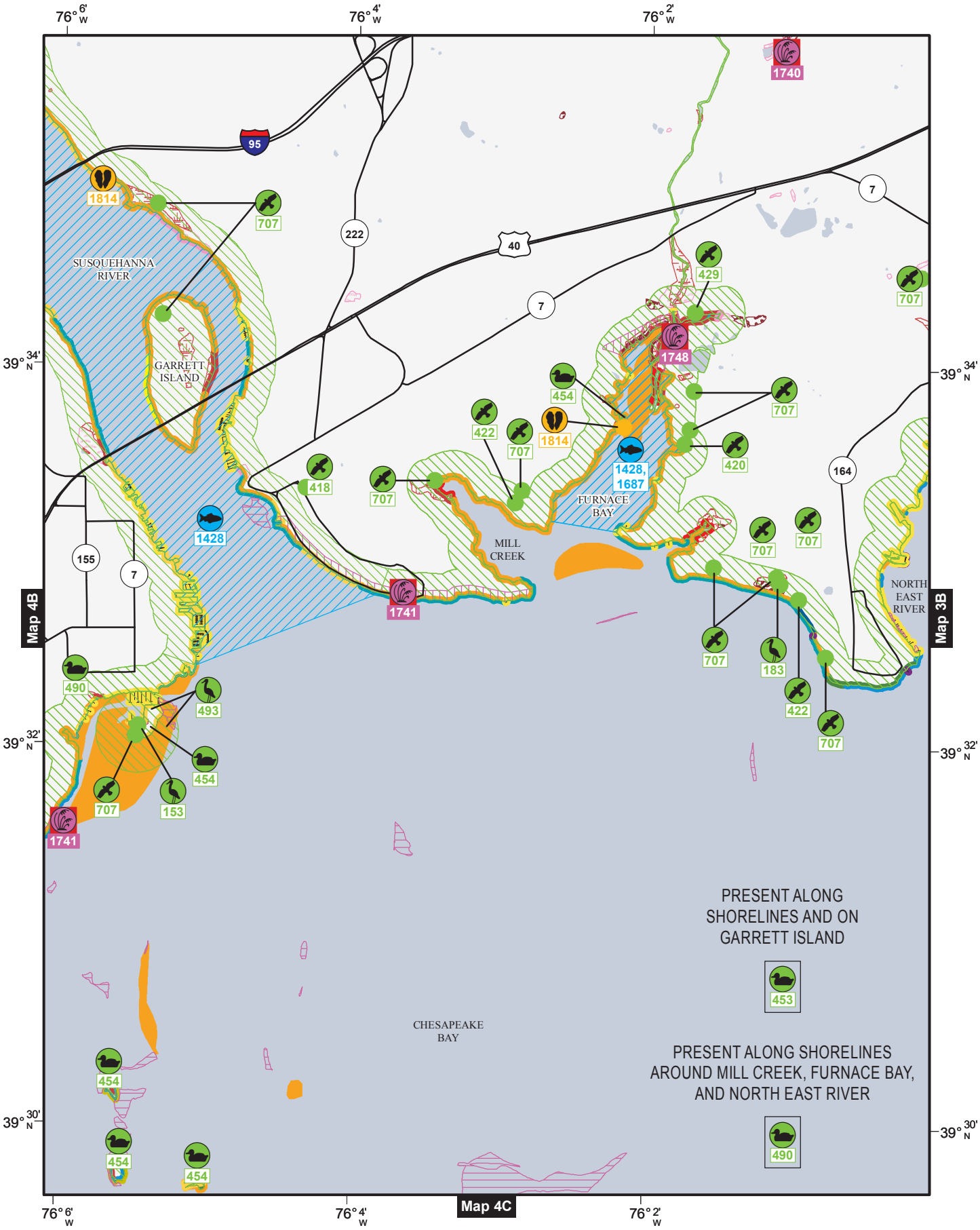
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	120,891.86	75.12	39%
10B	Freshwater Marshes	1,164.84	0.72	< 1%
10C	Swamps	19,328.18	12.01	6%
10D	Scrub and Shrub Wetlands	1,735.38	1.08	1%
9A	Sheltered Tidal Flats	32,841.05	20.41	11%
9B	Vegetated Low Banks	55,162.12	34.28	18%
8A	Sheltered Scarps (Bedrock/Mud/Clay)	1,086.00	0.67	< 1%
8B	Sheltered, Solid Man-Made Structures	16,498.86	10.25	5%
8C	Sheltered Riprap	9,075.37	5.64	3%
8D	Sheltered, Rocky, Rubble Shores	1,652.85	1.03	1%
7	Exposed Tidal Flats	1,140.74	0.71	< 1%
6B	Riprap	5,226.82	3.25	2%
6D	Boulder Rubble	1,014.02	0.63	< 1%
5	Mixed Sand and Gravel Beaches	10,342.13	6.43	3%
4	Coarse Grained Sand Beaches	28,943.72	17.98	9%
3B	Scarps and Steep Slopes (Sand)	1,803.50	1.12	1%
1B	Exposed, Solid Man-Made Structures	433.13	0.27	< 1%

Total ESI Shoreline:	308,340.57	Total ESI Shoreline:	191.59
Total Shoreline:	216,822.02	Total Shoreline:	134.73

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 4A

Chesapeake North

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

N

Map 4A
Chesapeake North

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
153	Wading	Great blue heron	Nesting			4 Nests													Feb-Jun	-	-	-	-
183	Wading	Great blue heron	Nesting			9 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
420	Raptor	Bald eagle	Nesting			Last Obs. 2002													Feb-Apr	-	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-	-
429	Raptor	Bald eagle	Nesting			Last Obs. 2006													Feb-Apr	-	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
454	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
490	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
493	Wading	Great blue heron	Nesting			4 Pairs													Feb-Jun	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1428	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
1687	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D				
1740	Plant	Endangered plant	Vulnerable Occurrence	E/-		3 Species Present	-	-	-	-	-
	Plant	Threatened plant	Vulnerable Occurrence	T/-		2 Species Present	-	-	-	-	-
1741	Plant	Threatened plant	Vulnerable Occurrence	T/-		-	-	-	-	-	-
1748	Plant	Endangered plant	Vulnerable Occurrence	E/-		2 Species Present	-	-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D	Spawn	Eggs	Larvae	Juveniles	Adults
1814	Bivalve	Eastern elliptio	Vulnerable Occurrence			-	-	-	-	Jan-Dec	Jan-Dec

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BENTHIC

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

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D	Nest	Mig.(S)	Mig.(F)	Molt	
Diving	Common loon	Wintering			10S		-	-	-	-	-
	D. crested cormorant	Migration			100S		-	Mar-May	Aug-Nov	-	-
	Grebes	Wintering			Present		-	-	-	-	-
Waterfowl	American black duck	Wintering			1,000S		-	-	-	-	-
	American coot	Wintering			1,000S		-	-	-	-	-
	American wigeon	Wintering			100S		-	-	-	-	-
	Bufflehead	Wintering			1,000S		-	-	-	-	-
	Canada goose	Wintering			10,000S		-	-	-	-	-
	Canvasback	Wintering			1,000S		-	-	-	-	-
	Common goldeneye	Wintering			100S		-	-	-	-	-
	Gadwall	Wintering			1,000S		-	-	-	-	-
	Long-tailed duck	Wintering			10S		-	-	-	-	-
	Mallard	Wintering			1,000S		-	-	-	-	-
	Mergansers	Wintering			10,000S		-	-	-	-	-
	Redhead	Wintering			10S		-	-	-	-	-
	Ring-necked duck	Wintering			100S		-	-	-	-	-
	Ruddy duck	Wintering			1,000S		-	-	-	-	-
	Scaup	Wintering			10,000S		-	-	-	-	-
	Scoters	Wintering			Present		-	-	-	-	-
	Snow goose	Wintering			1,000S		-	-	-	-	-
	Tundra swan	Wintering			1,000S		-	-	-	-	-
	Wood duck	Wintering			Present		-	-	-	-	-

FISH

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Chesapeake logperch													Apr-Jun	-	-	-	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	Walleye													Mar-May	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

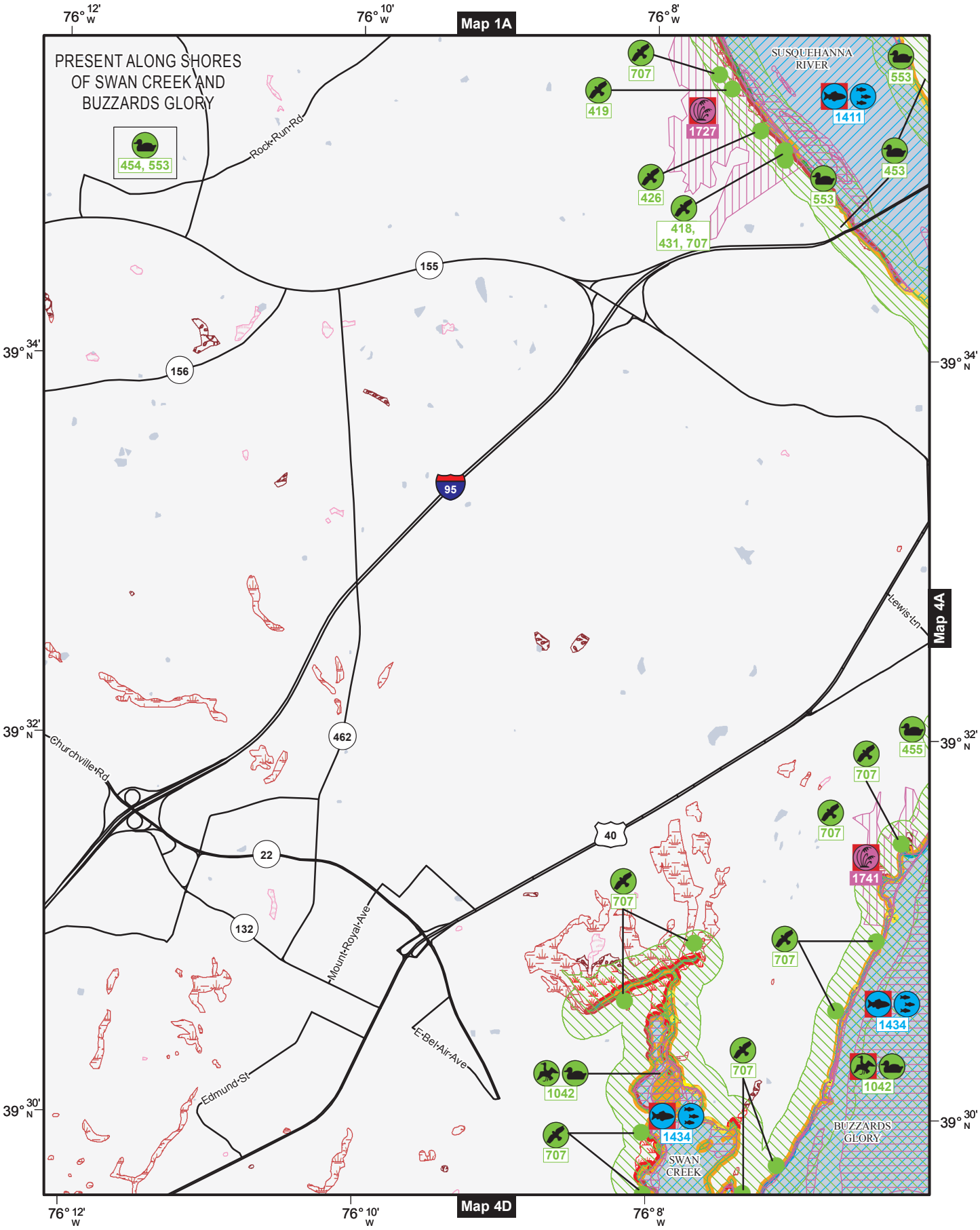
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	23.59	0.04
10B	Freshwater Marshes	43.46	0.07
10C	Swamps	95.14	0.15
10D	Scrub and Shrub Wetlands	21.52	0.03
9A	Sheltered Tidal Flats	317.71	0.50

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	4,536.15	2.82	5%
10B	Freshwater Marshes	1,164.84	0.72	1%
10C	Swamps	5,028.14	3.12	6%
10D	Scrub and Shrub Wetlands	719.67	0.45	1%
9A	Sheltered Tidal Flats	11,163.83	6.94	13%
9B	Vegetated Low Banks	22,738.18	14.13	27%
8A	Sheltered Scarps (Bedrock/Mud/Clay)	753.98	0.47	1%
8B	Sheltered, Solid Man-Made Structures	15,507.42	9.64	18%
8C	Sheltered Riprap	5,693.51	3.54	7%
8D	Sheltered, Rocky, Rubble Shores	1,100.27	0.68	1%
7	Exposed Tidal Flats	982.23	0.61	1%
6B	Riprap	1,566.42	0.97	2%
5	Mixed Sand and Gravel Beaches	9,875.61	6.14	12%
4	Coarse Grained Sand Beaches	3,490.28	2.17	4%
3B	Scarps and Steep Slopes (Sand)	398.85	0.25	< 1%
1B	Exposed, Solid Man-Made Structures	354.42	0.22	< 1%
	Total ESI Shoreline:	85,073.79	Total ESI Shoreline:	52.86
	Total Shoreline:	54,887.10	Total Shoreline:	34.11

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 4B

Chesapeake North

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

N

Map 4B
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
419	Raptor	Bald eagle	Nesting			Last Obs. 1999													Feb-Apr	-	-	-	-
426	Raptor	Bald eagle	Nesting			Last Obs. 1993													Feb-Apr	-	-	-	-
431	Raptor	Bald eagle	Nesting			Last Obs. 1992													Feb-Apr	-	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
454	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
455	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American coot	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-	-
	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Mallard	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Wintering			Present													-	-	-	-	-
553	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American coot	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Mallard	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Wood duck	Wintering			Present													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1042	Diving	Common loon	Wintering			10S													-	-	-	-	-
	Diving	D. crested cormorant	Migration			100S													-	Mar-May	Aug-Nov	-	-

BIRDS (continued)

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

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1411	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1434	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
1741	Plant	Threatened plant	Vulnerable Occurrence	T/-		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Chesapeake logperch													Apr-Jun	-	-	-	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	Walleye													Mar-May	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	93.06	0.15
10B	Freshwater Marshes	32.47	0.05
10C	Swamps	368.18	0.58
10D	Scrub and Shrub Wetlands	41.42	0.06
9A	Sheltered Tidal Flats	32.42	0.05

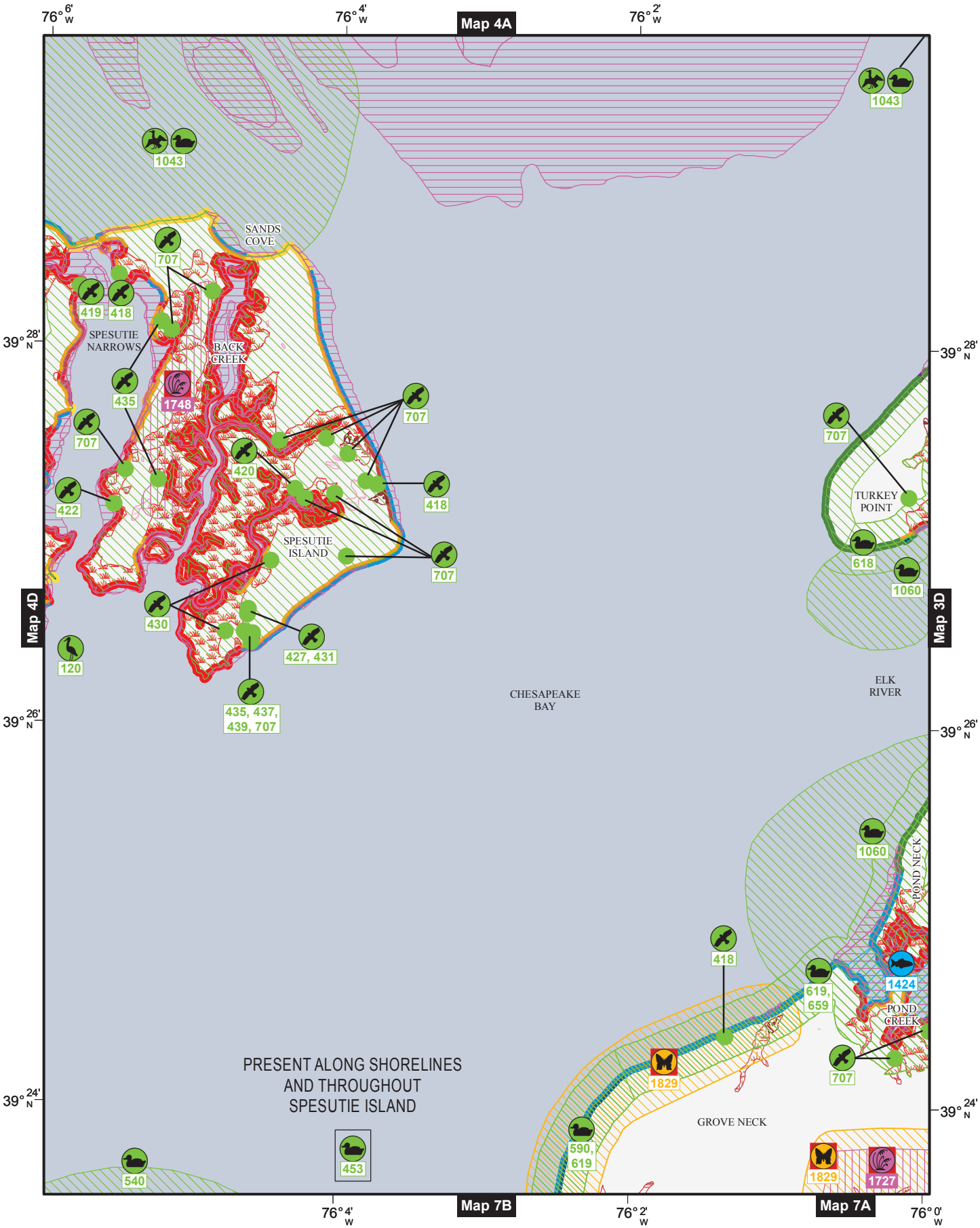
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	8,410.12	5.23	18%
10C	Swamps	6,227.83	3.87	13%
10D	Scrub and Shrub Wetlands	247.91	0.15	1%
9A	Sheltered Tidal Flats	13,299.14	8.26	29%
9B	Vegetated Low Banks	10,836.69	6.73	23%
8A	Sheltered Scarps (Bedrock/Mud/Clay)	332.02	0.21	1%
8B	Sheltered, Solid Man-Made Structures	349.46	0.22	1%
8C	Sheltered Riprap	765.98	0.48	2%
8D	Sheltered, Rocky, Rubble Shores	552.58	0.34	1%
6D	Boulder Rubble	1,014.02	0.63	2%
5	Mixed Sand and Gravel Beaches	159.83	0.10	< 1%
4	Coarse Grained Sand Beaches	4,288.22	2.66	9%

Total ESI Shoreline:	46,483.80	Total ESI Shoreline:	28.88
Total Shoreline:	21,924.20	Total Shoreline:	13.62

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

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



Map 4C

Chesapeake North

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

N

Map 4C
Chesapeake North

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	MD/VA 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												

Subelement	Species	Mapping Qualifier	Nest	Mig.(S)	Mig.(F)	Molt
SAV	Submerged aquatic veg	High Ecological Value	-	-	-	-
SAV	Submerged aquatic veg	High Ecological Value	-	-	-	-
SAV	Submerged aquatic veg	High Ecological Value	-	-	-	-

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D
120	Wading	Great blue heron	Nesting			5 Nests												
418	Raptor	Bald eagle	Nesting			Last Obs. 2004												
419	Raptor	Bald eagle	Nesting			Last Obs. 1999												
420	Raptor	Bald eagle	Nesting			Last Obs. 2002												
422	Raptor	Bald eagle	Nesting			Last Obs. 2003												
427	Raptor	Bald eagle	Nesting			Last Obs. 1994												
430	Raptor	Bald eagle	Nesting			Last Obs. 2007												
431	Raptor	Bald eagle	Nesting			Last Obs. 1992												
435	Raptor	Bald eagle	Nesting			Last Obs. 2008												
437	Raptor	Bald eagle	Nesting			Last Obs. 1995												
439	Raptor	Bald eagle	Nesting			Last Obs. 1988												
453	Waterfowl	Canada goose	Nesting			Moderate-High												
	Waterfowl	Mallard	Nesting			Moderate-High												
	Waterfowl	Wood duck	Nesting			Moderate-High												
540	Waterfowl	Bufflehead	Wintering			100S												
	Waterfowl	Common goldeneye	Wintering			10S												
	Waterfowl	Mergansers	Wintering			1,000S												
	Waterfowl	Redhead	Wintering			10S												
	Waterfowl	Ruddy duck	Wintering			10S												
	Waterfowl	Scaup	Wintering			10,000S												
	Waterfowl	Snow goose	Wintering			1,000S												
	Waterfowl	Tundra swan	Wintering			100S												
590	Waterfowl	Green-winged teal	Wintering			100S												
	Waterfowl	Northern pintail	Wintering			100S												
	Waterfowl	Northern shoveler	Wintering			10S												
618	Waterfowl	American black duck	Wintering			100S												
	Waterfowl	American coot	Wintering			100S												
	Waterfowl	American wigeon	Wintering			10S												
	Waterfowl	Gadwall	Wintering			100S												
619	Waterfowl	American black duck	Wintering			100S												

Map ID	Subelement	Species	Mapping Qualifier	Nest	Mig.(S)	Mig.(F)	Molt
120	Wading	Great blue heron	Nesting	Feb-Jun	-	-	-
418	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
419	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
420	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
422	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
427	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
430	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
431	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
435	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
437	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
439	Raptor	Bald eagle	Nesting	Feb-Apr	-	-	-
453	Waterfowl	Canada goose	Nesting	Mar-Jun	-	-	Jul-Aug
	Waterfowl	Mallard	Nesting	Mar-Aug	-	-	Jul-Aug
	Waterfowl	Wood duck	Nesting	Mar-Jun	-	-	Jul-Aug
540	Waterfowl	Bufflehead	Wintering	-	-	-	-
	Waterfowl	Common goldeneye	Wintering	-	-	-	-
	Waterfowl	Mergansers	Wintering	-	-	-	-
	Waterfowl	Redhead	Wintering	-	-	-	-
	Waterfowl	Ruddy duck	Wintering	-	-	-	-
	Waterfowl	Scaup	Wintering	-	-	-	-
	Waterfowl	Snow goose	Wintering	-	-	-	-
	Waterfowl	Tundra swan	Wintering	-	-	-	-
590	Waterfowl	Green-winged teal	Wintering	-	-	-	-
	Waterfowl	Northern pintail	Wintering	-	-	-	-
	Waterfowl	Northern shoveler	Wintering	-	-	-	-
618	Waterfowl	American black duck	Wintering	-	-	-	-
	Waterfowl	American coot	Wintering	-	-	-	-
	Waterfowl	American wigeon	Wintering	-	-	-	-
	Waterfowl	Gadwall	Wintering	-	-	-	-
619	Waterfowl	American black duck	Wintering	-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American coot	Wintering			100S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-	-
659	Waterfowl	American wigeon	Wintering			10S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1043	Diving	Common loon	Wintering			10S													-	-	-	-	-
	Diving	D. crested cormorant	Migration			100S													-	Mar-May	Aug-Nov	-	-
	Diving	Grebes	Wintering			Present													-	-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S													-	-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			10S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scoters	Wintering			Present													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			1,000S													-	-	-	-	-
1060	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1424	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
1748	Plant	Endangered plant	Vulnerable Occurrence	E/-		2 Species Present													-	-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1829	Insect	Federally threatened insect 2	Vulnerable Occurrence	E/-	T	-													Jun-Aug	Jun-Jul	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	American coot	Wintering			1,000S													-	-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-	-
	Canada goose	Wintering			10,000S													-	-	-	-	-
	Canvasback	Wintering			1,000S													-	-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-	-
	Mallard	Wintering			1,000S													-	-	-	-	-
	Ring-necked duck	Wintering			100S													-	-	-	-	-
	Wood duck	Wintering			Present													-	-	-	-	-

FISH

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Chesapeake logperch													Apr-Jun	-	-	-	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

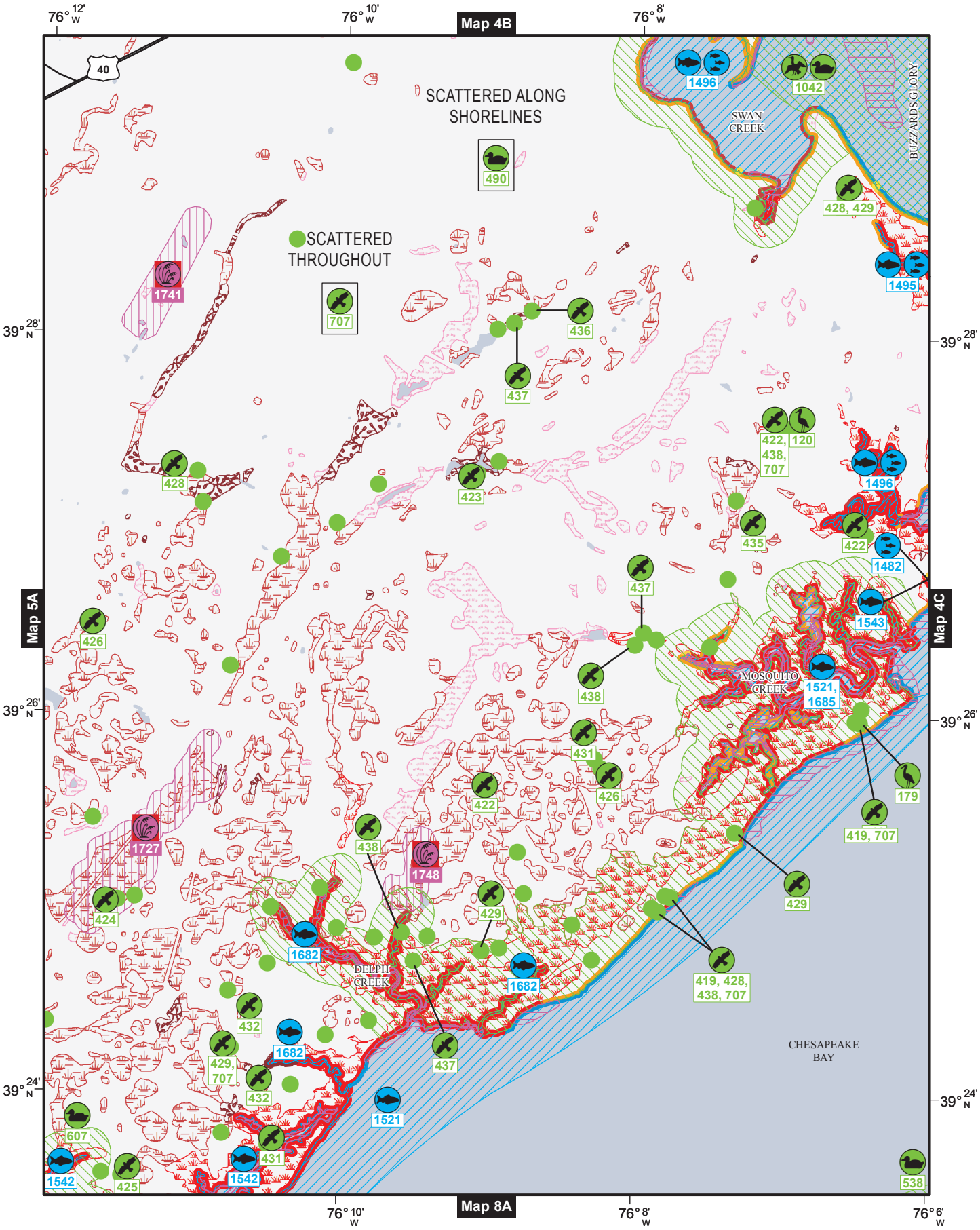
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	844.87	1.32
10B	Freshwater Marshes	14.97	0.02
10C	Swamps	34.36	0.05
10D	Scrub and Shrub Wetlands	12.64	0.02

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	46,426.33	28.85	57%
10C	Swamps	2,962.44	1.84	4%
10D	Scrub and Shrub Wetlands	137.79	0.09	< 1%
9A	Sheltered Tidal Flats	245.51	0.15	< 1%
9B	Vegetated Low Banks	10,275.05	6.38	13%
8B	Sheltered, Solid Man-Made Structures	565.40	0.35	1%
8C	Sheltered Riprap	2,460.79	1.53	3%
7	Exposed Tidal Flats	158.50	0.10	< 1%
6B	Riprap	3,660.40	2.27	5%
5	Mixed Sand and Gravel Beaches	306.68	0.19	< 1%
4	Coarse Grained Sand Beaches	12,336.18	7.67	15%
3B	Scarps and Steep Slopes (Sand)	1,404.65	0.87	2%
1B	Exposed, Solid Man-Made Structures	78.71	0.05	< 1%
	Total ESI Shoreline:	81,018.45	Total ESI Shoreline:	50.34
	Total Shoreline:	68,091.67	Total Shoreline:	42.31

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 4D

Chesapeake North

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

N

Map 4D
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt
120	Wading	Great blue heron	Nesting			5 Nests													Feb-Jun	-	-	-
179	Wading	Great blue heron	Nesting			26 Nests													Feb-Jun	-	-	-
419	Raptor	Bald eagle	Nesting			Last Obs. 1999													Feb-Apr	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-
423	Raptor	Bald eagle	Nesting			Last Obs. 2000													Feb-Apr	-	-	-
424	Raptor	Bald eagle	Nesting			Last Obs. 1997													Feb-Apr	-	-	-
425	Raptor	Bald eagle	Nesting			Last Obs. 1998													Feb-Apr	-	-	-
426	Raptor	Bald eagle	Nesting			Last Obs. 1993													Feb-Apr	-	-	-
428	Raptor	Bald eagle	Nesting			Last Obs. 2005													Feb-Apr	-	-	-
429	Raptor	Bald eagle	Nesting			Last Obs. 2006													Feb-Apr	-	-	-
431	Raptor	Bald eagle	Nesting			Last Obs. 1992													Feb-Apr	-	-	-
432	Raptor	Bald eagle	Nesting			Last Obs. 1989													Feb-Apr	-	-	-
435	Raptor	Bald eagle	Nesting			Last Obs. 2008													Feb-Apr	-	-	-
436	Raptor	Bald eagle	Nesting			Last Obs. 1991													Feb-Apr	-	-	-
437	Raptor	Bald eagle	Nesting			Last Obs. 1995													Feb-Apr	-	-	-
438	Raptor	Bald eagle	Nesting			Last Obs. 1996													Feb-Apr	-	-	-
490	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug
538	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-
	Waterfowl	Redhead	Wintering			10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-
	Waterfowl	Snow goose	Wintering			1,000S													-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-
607	Waterfowl	American coot	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			10S													-	-	-	-
	Waterfowl	Northern pintail	Wintering			100S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	Northern shoveler	Wintering			100S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1042	Diving	Common loon	Wintering			10S													-	-	-	-	-
	Diving	D. crested cormorant	Migration			100S													-	Mar-May	Aug-Nov	-	-
	Diving	Grebes	Wintering			Present													-	-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S													-	-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			10S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scoters	Wintering			Present													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			1,000S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1482	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
1495	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1496	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1521	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1542	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1543	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1682	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
1685	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
1741	Plant	Threatened plant	Vulnerable Occurrence	T/-		-													-	-	-	-	-
1748	Plant	Endangered plant	Vulnerable Occurrence	E/-		2 Species Present													-	-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
		American coot	Wintering			1,000S													-	-	-	-	-
		American wigeon	Wintering			100S													-	-	-	-	-
		Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
		Gadwall	Wintering			1,000S													-	-	-	-	-
		Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
		Mallard	Wintering			1,000S													-	-	-	-	-
		Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
		Wood duck	Wintering			Present													-	-	-	-	-

FISH

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Chesapeake logperch													Apr-Jun	-	-	-	Jan-Dec
	Common carp													May-Jun	-	-	-	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence J F M A M J J A S O N D	Spawn	Eggs	Larvae	Juveniles	Adults
	Sunfish		Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter		Apr-Jun	-	-	-	Jan-Dec
	White crappie		-	-	-	-	Jan-Dec
	Yellow perch		-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,505.46	2.35
10B	Freshwater Marshes	476.65	0.74
10C	Swamps	2,114.93	3.30
10D	Scrub and Shrub Wetlands	162.50	0.25

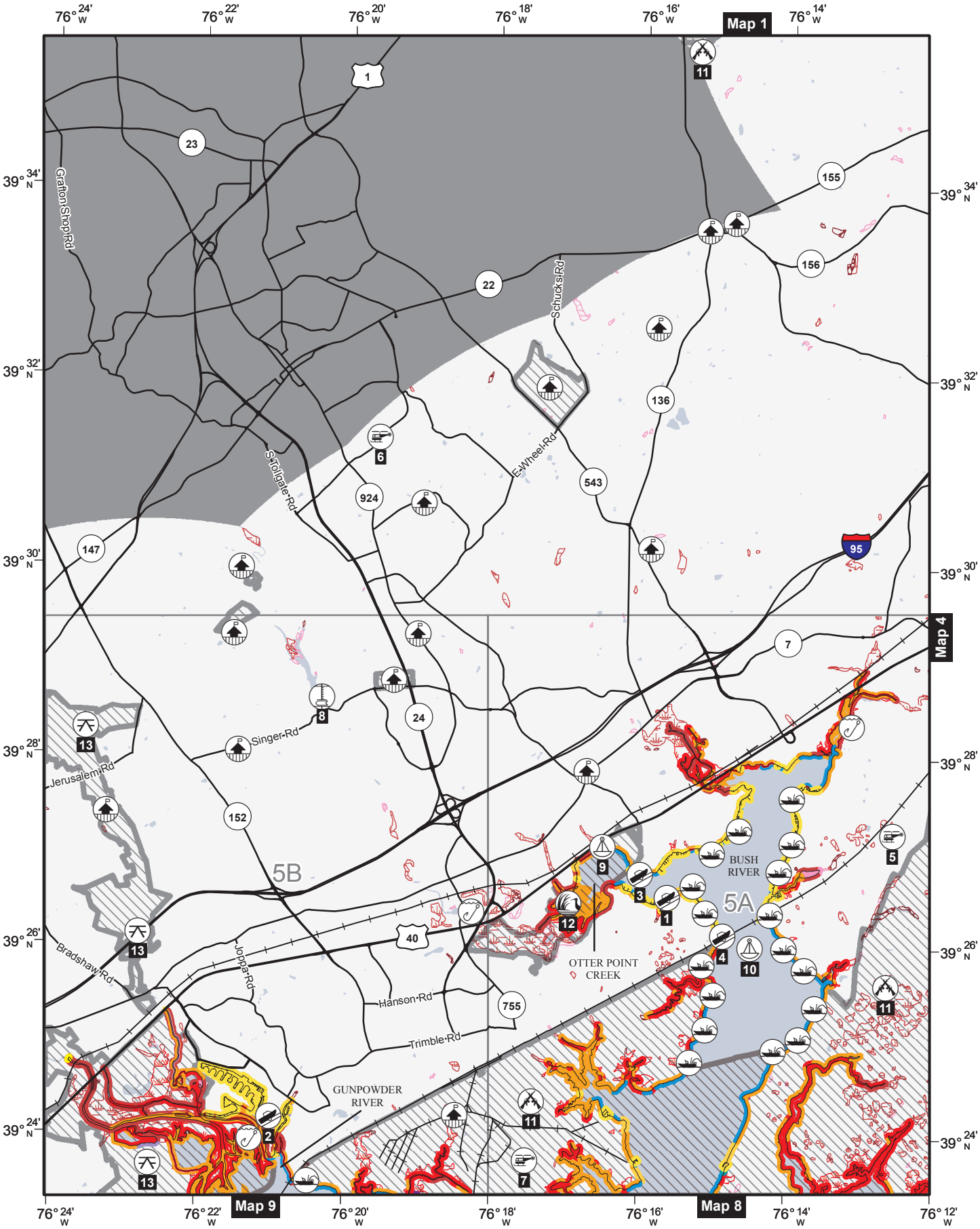
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	61,519.26	38.23	64%
10C	Swamps	5,109.77	3.18	5%
10D	Scrub and Shrub Wetlands	630.01	0.39	1%
9A	Sheltered Tidal Flats	8,132.57	5.05	8%
9B	Vegetated Low Banks	11,312.19	7.03	12%
8B	Sheltered, Solid Man-Made Structures	76.58	0.05	< 1%
8C	Sheltered Riprap	155.10	0.10	< 1%
4	Coarse Grained Sand Beaches	8,829.04	5.49	9%

Total ESI Shoreline:	95,764.53	Total ESI Shoreline:	59.51
Total Shoreline:	71,919.05	Total Shoreline:	44.69

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 5

Chesapeake North

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

N

Map 5
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	BOAT RAMP	FLYING POINT PARK	HARFORD COUNTY - DEPT. OF PARKS AND REC.	
2	BOAT RAMP	MARINER POINT PARK	HARFORD COUNTY - DEPT. OF PARKS AND REC.	
3	BOAT RAMP	OTTER POINT LANDING	HARFORD COUNTY - DEPT. OF PARKS AND REC.	
4	BOAT RAMP	WILLOUGHBY BEACH	HARFORD COUNTY - DEPT. OF PARKS AND REC.	
5	HELIPORT	RITE AID DISTRIBUTION CENTER		
6	HELIPORT	UPPER CHESAPEAKE MEDICAL CENTER		
7	HELIPORT	WEIDE AHP (ABERDEEN PROVING GROUND)		
8	LOCK AND DAM	ATKISSON DAM		
9	REPEATED MEASUREMENT SITE	DB - NERRS WQ STN, OTTER POINT CREEK, CHES BAY RES	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
10	REPEATED MEASUREMENT SITE	WQ - STATION WT1.1	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
11	MILITARY	ABERDEEN PROVING GROUND		
12	NATIONAL ESTUARINE RESEARCH RESERVE	CHESAPEAKE BAY MARYLAND RESERVE	CHESAPEAKE BAY MARYLAND RESERVE	410-260-8730
13	PARK	GUNPOWDER FALLS SP	MARYLAND PARK SERVICE	

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
STATE PROTECTED AREA	BUSH DECLARATION NRMA	MARYLAND PARK SERVICE	
STATE PROTECTED AREA	STONEY DEMONSTRATION SF	MARYLAND FOREST SERVICE	

JURISDICTIONS

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,305.86	2.04
10B	Freshwater Marshes	126.32	0.20
10C	Swamps	1,095.26	1.71
10D	Scrub and Shrub Wetlands	84.05	0.13
9A	Sheltered Tidal Flats	187.49	0.29
7	Exposed Tidal Flats	0.14	0.00

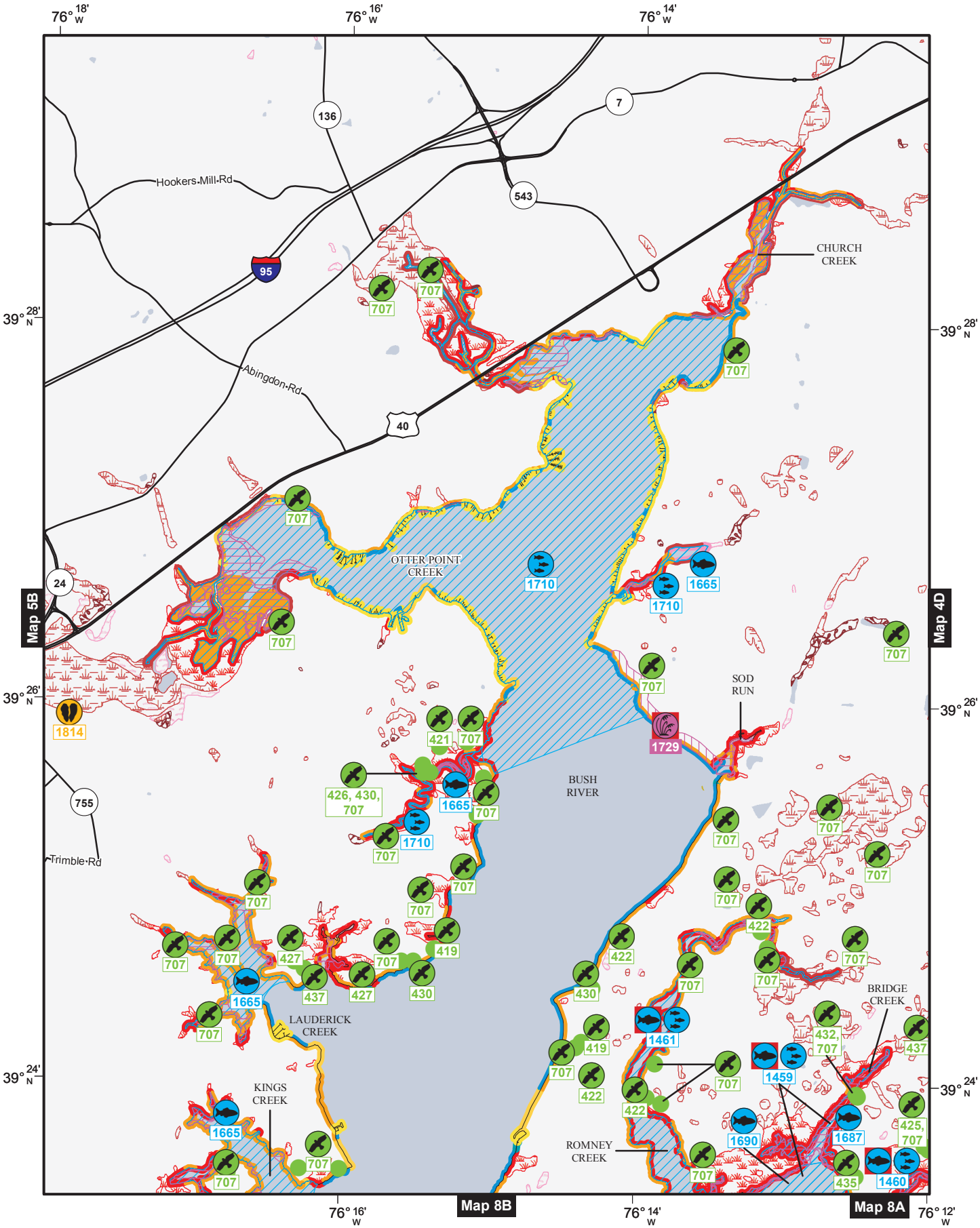
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	117,625.75	73.09	37%
10B	Freshwater Marshes	4,330.80	2.69	1%
10C	Swamps	36,217.38	22.50	12%
10D	Scrub and Shrub Wetlands	456.00	0.28	< 1%
9A	Sheltered Tidal Flats	53,768.84	33.41	17%
9B	Vegetated Low Banks	48,161.53	29.93	15%
8A	Sheltered Scarps (Bedrock/Mud/Clay)	44.67	0.03	< 1%
8B	Sheltered, Solid Man-Made Structures	26,496.00	16.46	8%
8C	Sheltered Riprap	4,583.13	2.85	1%
6B	Riprap	86.54	0.05	< 1%
5	Mixed Sand and Gravel Beaches	128.81	0.08	< 1%
4	Coarse Grained Sand Beaches	21,548.19	13.39	7%
2B	Exposed Scarps and Steep Slopes (Clay)	854.91	0.53	< 1%
1B	Exposed, Solid Man-Made Structures	56.61	0.04	< 1%

Total ESI Shoreline:	314,359.16	Total ESI Shoreline:	195.33
Total Shoreline:	184,884.62	Total Shoreline:	114.88

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 5A

Chesapeake North

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

N

Map 5A
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
419	Raptor	Bald eagle	Nesting			Last Obs. 1999													Feb-Apr	-	-	-	-
421	Raptor	Bald eagle	Nesting			Last Obs. 2001													Feb-Apr	-	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-	-
425	Raptor	Bald eagle	Nesting			Last Obs. 1998													Feb-Apr	-	-	-	-
426	Raptor	Bald eagle	Nesting			Last Obs. 1993													Feb-Apr	-	-	-	-
427	Raptor	Bald eagle	Nesting			Last Obs. 1994													Feb-Apr	-	-	-	-
430	Raptor	Bald eagle	Nesting			Last Obs. 2007													Feb-Apr	-	-	-	-
432	Raptor	Bald eagle	Nesting			Last Obs. 1989													Feb-Apr	-	-	-	-
435	Raptor	Bald eagle	Nesting			Last Obs. 2008													Feb-Apr	-	-	-	-
437	Raptor	Bald eagle	Nesting			Last Obs. 1995													Feb-Apr	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1459	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1460	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1461	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1665	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Mar-Jun
1687	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
1690	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
1710	Estuarine Nursery	White perch	Spawning Area			Historical Spawning													Mar-May	Mar-May	Apr-Jun	-	Mar-May

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D					
1729	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
	Plant	Threatened plant	Vulnerable Occurrence	T/-		-													-	-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1814	Bivalve	Eastern elliptio	Vulnerable Occurrence			-													-	-	-	Jan-Dec	Jan-Dec

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
	American black duck	Wintering			1,000S													-	-	-	-	-
	American coot	Wintering			100S													-	-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-	-
	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Gadwall	Wintering			1,000S													-	-	-	-	-
	Green-winged teal	Wintering			10S													-	-	-	-	-
	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Mallard	Wintering			1,000S													-	-	-	-	-
	Northern pintail	Wintering			100S													-	-	-	-	-
	Northern shoveler	Wintering			100S													-	-	-	-	-
	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Mar-May
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Blueback herring	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
Freshwater	Yellow perch	Spawning Area			Historical Spawning													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar

MARINE MAMMALS

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	-	-	Mar-May
	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	American shad													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Blueback herring													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Hickory shad													Apr-May	Apr-May	-	-	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

Subelement	Species	Monthly Presence (J F M A M J J A S O N D)	Spawn	Eggs	Larvae	Juveniles	Adults
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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	686.84	1.07
10B	Freshwater Marshes	62.47	0.10
10C	Swamps	762.42	1.19
10D	Scrub and Shrub Wetlands	51.46	0.08
9A	Sheltered Tidal Flats	137.21	0.21
7	Exposed Tidal Flats	0.14	0.00

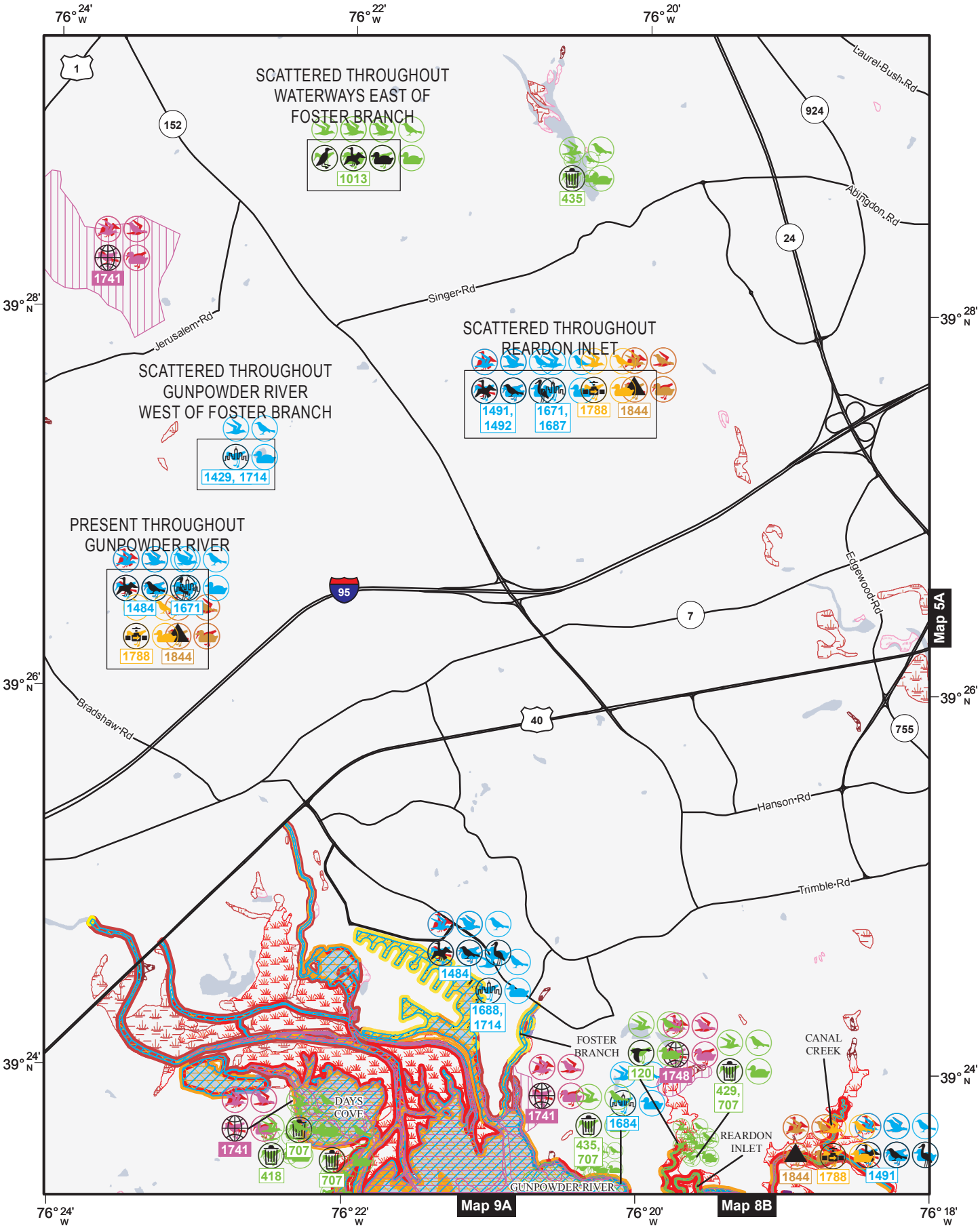
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	67,547.97	41.97	37%
10B	Freshwater Marshes	859.84	0.53	< 1%
10C	Swamps	12,044.63	7.48	7%
10D	Scrub and Shrub Wetlands	251.65	0.16	< 1%
9A	Sheltered Tidal Flats	24,212.66	15.05	13%
9B	Vegetated Low Banks	39,341.02	24.45	21%
8B	Sheltered, Solid Man-Made Structures	16,311.93	10.14	9%
8C	Sheltered Riprap	3,329.04	2.07	2%
5	Mixed Sand and Gravel Beaches	128.81	0.08	< 1%
4	Coarse Grained Sand Beaches	19,219.48	11.94	10%

Total ESI Shoreline:	183,247.04	Total ESI Shoreline:	113.86
Total Shoreline:	112,402.77	Total Shoreline:	69.84

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

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



Map 5B

Chesapeake North

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

N

Map 5B
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
120	Wading	Great blue heron	Nesting			5 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
429	Raptor	Bald eagle	Nesting			Last Obs. 2006													Feb-Apr	-	-	-	-
435	Raptor	Bald eagle	Nesting			Last Obs. 2008													Feb-Apr	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1013	Diving	Common loon	Wintering			10S													-	-	-	-	-
	Diving	D. crested cormorant	Migration			1,000S													-	Mar-May	Aug-Nov	-	-
	Diving	Grebes	Wintering			10S													-	-	-	-	-
	Diving	Red-throated loon	Wintering			10S													-	-	-	-	-
	Pelagic	Northern gannet	Wintering			Present													-	-	-	-	-
	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			100S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scoters	Wintering			10S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			10S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1429	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
1484	Diadromous	Atlantic sturgeon	General Distribution	**-/E**	**E**	-													-	-	-	-	Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	**E/E**	**E**	-													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1491	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	**-/E**	**E**	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	**E/E**	**E**	-													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1492	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Atlantic sturgeon	General Distribution	**-/E**	**E**	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	**E/E**	**E**	-													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1671	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Striped bass	Migration			-													-	-	-	-	Mar-Jun
1684	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
1687	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
1688	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
1714	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Feb-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1741	Plant	Threatened plant	Vulnerable Occurrence	**T/-**		-													-	-	-	-	-
1748	Plant	Endangered plant	Vulnerable Occurrence	**E/-**		2 Species Present													-	-	-	-	-

INVERTEBRATES

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

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	American coot	Wintering			100S													-	-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-	-
	Green-winged teal	Wintering			10S													-	-	-	-	-
	Mallard	Wintering			1,000S													-	-	-	-	-
	Northern pintail	Wintering			100S													-	-	-	-	-
	Northern shoveler	Wintering			100S													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	White perch													-	-	-	Jan-Dec	Jan-Dec
Freshwater	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	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
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	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

INVERTEBRATES

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

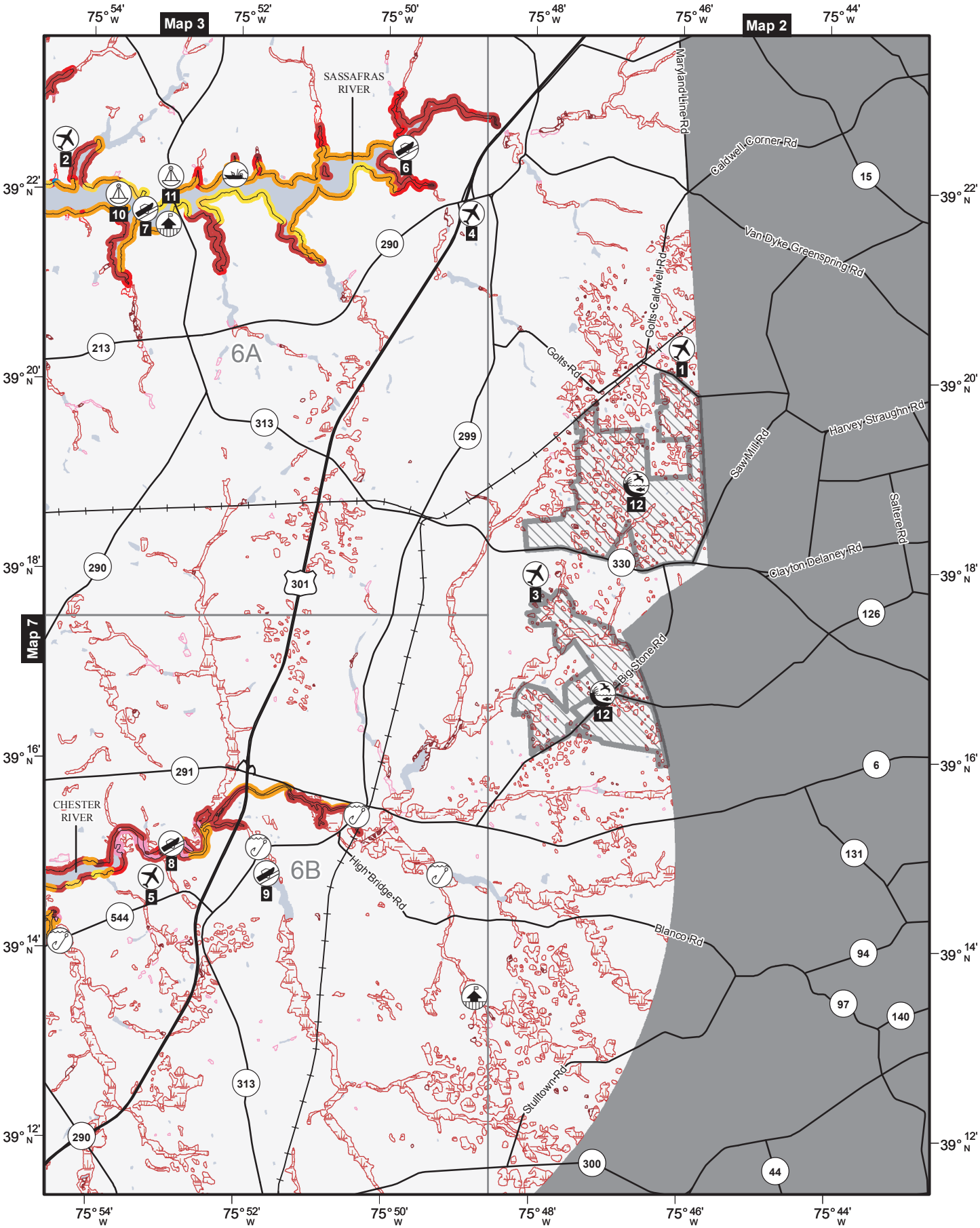
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	619.02	0.97
10B	Freshwater Marshes	29.85	0.05
10C	Swamps	274.01	0.43
10D	Scrub and Shrub Wetlands	14.10	0.02
9A	Sheltered Tidal Flats	50.28	0.08

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	50,077.78	31.12	38%
10B	Freshwater Marshes	3,470.96	2.16	3%
10C	Swamps	24,172.75	15.02	18%
10D	Scrub and Shrub Wetlands	204.35	0.13	< 1%
9A	Sheltered Tidal Flats	29,556.18	18.37	23%
9B	Vegetated Low Banks	8,820.51	5.48	7%
8A	Sheltered Scarps (Bedrock/Mud/Clay)	44.67	0.03	< 1%
8B	Sheltered, Solid Man-Made Structures	10,184.07	6.33	8%
8C	Sheltered Riprap	1,254.09	0.78	1%
6B	Riprap	86.54	0.05	< 1%
4	Coarse Grained Sand Beaches	2,328.71	1.45	2%
2B	Exposed Scarps and Steep Slopes (Clay)	854.91	0.53	1%
1B	Exposed, Solid Man-Made Structures	56.61	0.04	< 1%
	Total ESI Shoreline:	131,112.13	Total ESI Shoreline:	81.47
	Total Shoreline:	72,481.86	Total Shoreline:	45.04

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 6

Chesapeake North

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

N

Map 6
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	AIRPORT	D'ANGELO		
2	AIRPORT	HEXTON FARMS		
3	AIRPORT	MASSEY AERODROME		
4	AIRPORT	SCHLOSSER		
5	AIRPORT	SPRING LANDING		
6	BOAT RAMP	FOXHOLE LANDING	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
7	BOAT RAMP	FREDERICKTOWN	CECIL COUNTY - DEPT. OF PARKS AND RECREATION	
8	BOAT RAMP	SHADDING REACH	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
9	BOAT RAMP	UNICORN MILLPOND LAKE	MARYLAND DNR - FISHERIES SERVICES	
10	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, SASSAFRAS RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
11	REPEATED MEASUREMENT SITE	WQ - STATION ET3.1	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
12	MANAGEMENT AREA	MILLINGTON WMA	WILDLIFE AND HERITAGE SERVICE	

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
ESSENTIAL HABITAT	STATE ENDANGERED SPECIES		
STATE PROTECTED AREA	GOLTS PONDS HCF	MARYLAND PARK SERVICE	
STATE PROTECTED AREA	MASSEY POND HCF	MARYLAND PARK SERVICE	

JURISDICTIONS

COUNTY: CECIL COUNTY, KENT COUNTY, QUEEN ANNE'S COUNTY
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT
FEMA: REGION I
EPA: REGION 3

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	76.38	0.12
10B	Freshwater Marshes	223.96	0.35
10C	Swamps	5,665.06	8.85
10D	Scrub and Shrub Wetlands	219.73	0.34

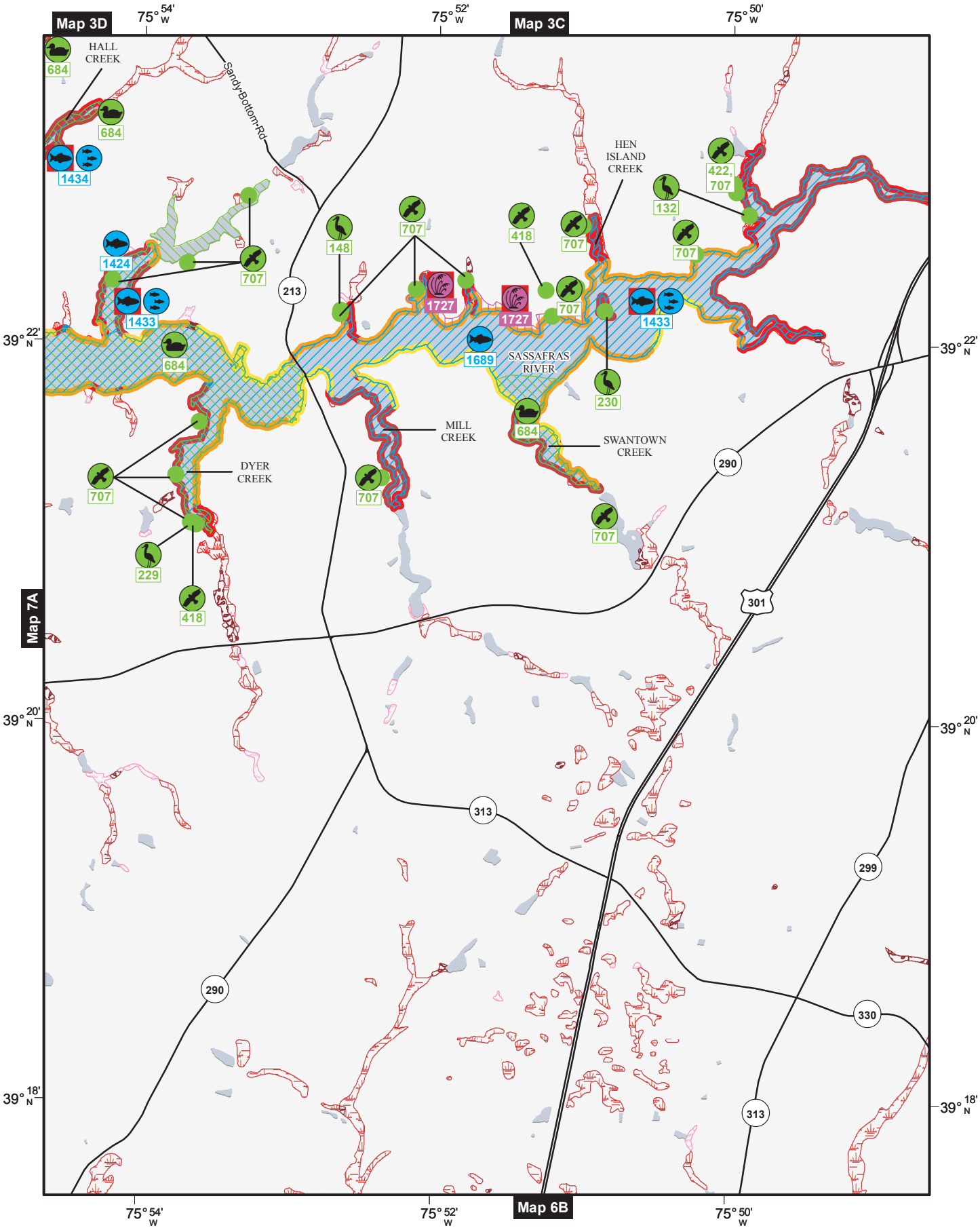
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	10,802.38	6.71	13%
10B	Freshwater Marshes	5,881.73	3.65	7%
10C	Swamps	32,125.89	19.96	40%
10D	Scrub and Shrub Wetlands	2,225.83	1.38	3%
9B	Vegetated Low Banks	20,890.79	12.98	26%
8B	Sheltered, Solid Man-Made Structures	7,111.46	4.42	9%
8C	Sheltered Riprap	931.76	0.58	1%
4	Coarse Grained Sand Beaches	223.10	0.14	< 1%

Total ESI Shoreline:	80,192.94	Total ESI Shoreline:	49.83
Total Shoreline:	75,625.18	Total Shoreline:	46.99

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 6A

Chesapeake North

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

N

Map 6A
Chesapeake North

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	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
132	Wading	Great blue heron	Nesting			52 Nests													Feb-Jun	-	-	-	-
148	Wading	Great blue heron	Nesting			32 Nests													Feb-Jun	-	-	-	-
229	Wading	Great blue heron	Nesting			31 Nests													Feb-Jun	-	-	-	-
230	Wading	Great blue heron	Nesting			78 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-	-
684	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			100S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1424	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
1433	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1434	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1689	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun

HABITATS & RARE PLANTS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
		American coot	Wintering			100S													-	-	-	-	-
		American wigeon	Wintering			100S													-	-	-	-	-
		Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
		Gadwall	Wintering			100S													-	-	-	-	-
		Green-winged teal	Wintering			100S													-	-	-	-	-
		Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
		Mallard	Wintering			1,000S													-	-	-	-	-
		Northern pintail	Wintering			100S													-	-	-	-	-
		Northern shoveler	Wintering			10S													-	-	-	-	-
		Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	72.11	0.11
10B	Freshwater Marshes	46.53	0.07
10C	Swamps	632.64	0.99
10D	Scrub and Shrub Wetlands	48.16	0.08

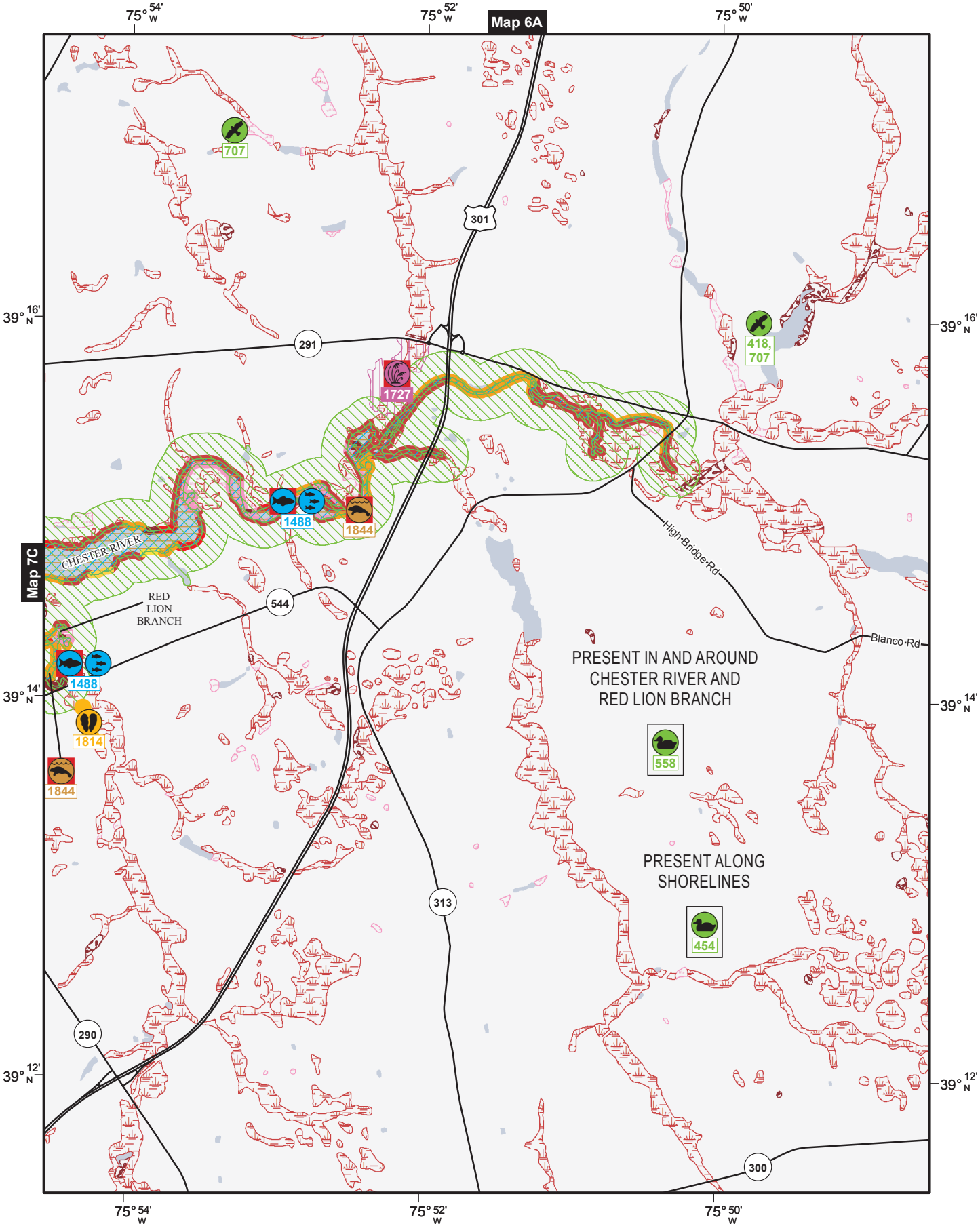
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	9,427.69	5.86	19%
10B	Freshwater Marshes	153.70	0.10	< 1%
10C	Swamps	17,106.99	10.63	35%
10D	Scrub and Shrub Wetlands	200.12	0.12	< 1%
9B	Vegetated Low Banks	14,440.03	8.97	29%
8B	Sheltered, Solid Man-Made Structures	6,916.83	4.30	14%
8C	Sheltered Riprap	728.98	0.45	1%
4	Coarse Grained Sand Beaches	223.10	0.14	< 1%

Total ESI Shoreline:	49,197.45	Total ESI Shoreline:	30.57
Total Shoreline:	47,703.96	Total Shoreline:	29.64

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 6B

Chesapeake North

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

N

Map 6B
Chesapeake North

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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
454	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
558	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American coot	Wintering			Present													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Mallard	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Northern pintail	Wintering			100S													-	-	-	-	-
	Waterfowl	Northern shoveler	Wintering			100S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1488	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			Strong Run													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			Weak Run													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	**-/E**	**E**	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			Strong Run													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			Moderate Run													Apr-May	Apr-May	-	-	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	**E/E**	**E**	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar

HABITATS & RARE PLANTS

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

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D	Spawn	Eggs	Larvae	Juveniles	Adults
1814	Bivalve	Eastern elliptio	Vulnerable Occurrence			-		-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

TERRESTRIAL MAMMALS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D					
	Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-		-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

	Subelement	Species	Monthly Presence J F M A M J J A S O N D	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	Alewife		Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
		American eel		-	-	-	Jan-May	Jan-Dec
		American shad		Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
		Blueback herring		Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
		Gizzard shad		Mar-Jun	-	-	Jan-Dec	Jan-Dec
		Hickory shad		Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
		Striped bass		-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	White perch		-	-	-	Jan-Dec	Jan-Dec
	Freshwater	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
		Redfin pickerel		Feb-Mar	-	-	Jan-Dec	Jan-Dec
		Shorthead redhorse		Mar-Jun	-	-	-	Jan-Dec
		Sunfish		Mar-Jul	-	-	-	Jan-Dec
		Tessellated darter		Apr-Jun	-	-	-	Jan-Dec
		Yellow perch		-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	2.22	0.00
10B	Freshwater Marshes	134.42	0.21
10C	Swamps	2,423.40	3.79
10D	Scrub and Shrub Wetlands	96.39	0.15

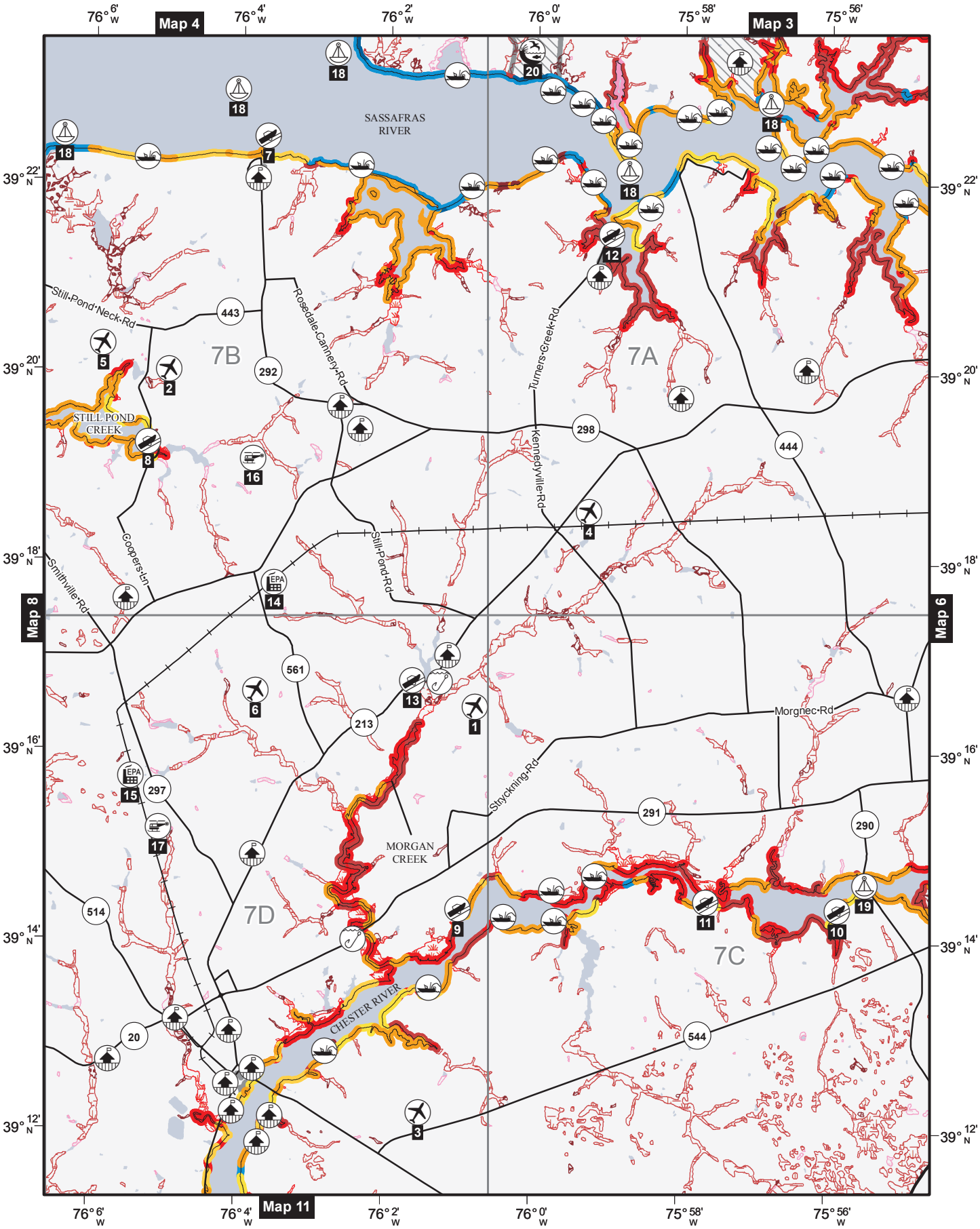
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	1,129.57	0.70	4%
10B	Freshwater Marshes	5,728.03	3.56	19%
10C	Swamps	14,808.59	9.20	49%
10D	Scrub and Shrub Wetlands	1,773.30	1.10	6%
9B	Vegetated Low Banks	6,450.75	4.01	21%
8B	Sheltered, Solid Man-Made Structures	194.63	0.12	1%
8C	Sheltered Riprap	202.77	0.13	1%

Total ESI Shoreline:	30,287.66	Total ESI Shoreline:	18.82
Total Shoreline:	27,213.38	Total Shoreline:	16.91

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

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



Map 7

Chesapeake North

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

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Map 7
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	AIRPORT	CROMWELL FARM		
2	AIRPORT	HARRIS		
3	AIRPORT	HYBARC FARM		
4	AIRPORT	KRASTEL FARMS		
5	AIRPORT	SMITH FIELD		
6	AIRPORT	WRIGHT FIELD		
7	BOAT RAMP	BETTERTON	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
8	BOAT RAMP	BOAT RAMP		
9	BOAT RAMP	BUCKINGHAM WHARF	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
10	BOAT RAMP	CRUMPTON LANDING	QUEEN ANNE'S COUNTY - PARKS AND RECREATION	
11	BOAT RAMP	DEEP LANDING	QUEEN ANNE'S COUNTY - PARKS AND RECREATION	
12	BOAT RAMP	TURNER'S CREEK	KENT COUNTY - PARKS AND RECREATION	
13	BOAT RAMP	URIEVILLE LAKE	MARYLAND DNR - FISHERIES SERVICES	
14	EPA FACILITY	LYNCH, MD	GENERAL MANAGER	410-778-1000
15	EPA FACILITY	WORTON, MD 754	MANAGER	410-778-3670
16	HELIPORT	CHESTER RIVER HOSPITAL		
17	HELIPORT	NUODEX INC.		
18	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, SASSAFRAS RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
19	REPEATED MEASUREMENT SITE	WQ - STATION ET4.1	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
20	MANAGEMENT AREA	GROVE FARM WMA	WILDLIFE AND HERITAGE SERVICE	

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
STATE PROTECTED AREA	SASSAFRASS NRMA	MARYLAND PARK SERVICE	

JURISDICTIONS

COUNTY: CECIL COUNTY, KENT COUNTY, QUEEN ANNE'S COUNTY
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT
FEMA: REGION I
EPA: REGION 3

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,032.79	1.61
10B	Freshwater Marshes	276.23	0.43
10C	Swamps	3,364.18	5.26
10D	Scrub and Shrub Wetlands	575.16	0.90
9A	Sheltered Tidal Flats	13.21	0.02

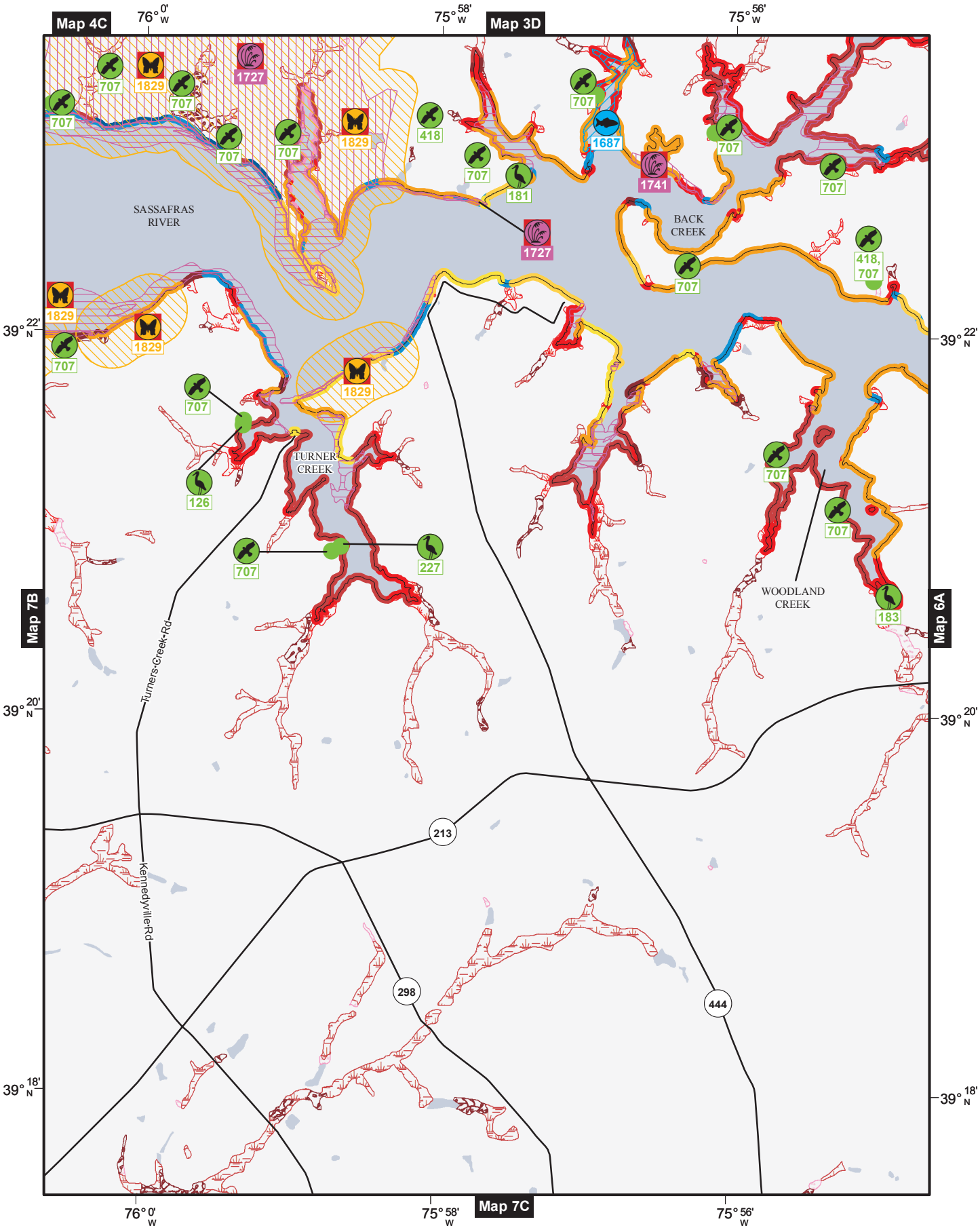
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	76,091.87	47.28	35%
10B	Freshwater Marshes	3,285.51	2.04	1%
10C	Swamps	36,551.41	22.71	17%
10D	Scrub and Shrub Wetlands	3,091.19	1.92	1%
9A	Sheltered Tidal Flats	229.74	0.14	< 1%
9B	Vegetated Low Banks	59,525.39	36.99	27%
8B	Sheltered, Solid Man-Made Structures	10,233.36	6.36	5%
8C	Sheltered Riprap	13,172.62	8.19	6%
4	Coarse Grained Sand Beaches	15,169.16	9.43	7%
3B	Scarps and Steep Slopes (Sand)	2,835.55	1.76	1%

Total ESI Shoreline:	220,185.83	Total ESI Shoreline:	136.82
Total Shoreline:	203,332.53	Total Shoreline:	126.34

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 7A

Chesapeake North

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

N

Map 7A
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D	Nest	Mig.(S)	Mig.(F)	Molt	
126	Wading	Great blue heron	Nesting			3 Nests		Feb-Jun	-	-	-	-
181	Wading	Great blue heron	Nesting			25 Nests		Feb-Jun	-	-	-	-
183	Wading	Great blue heron	Nesting			9 Nests		Feb-Jun	-	-	-	-
227	Wading	Great blue heron	Nesting			33 Nests		Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004		Feb-Apr	-	-	-	-
707	Raptor	Bald eagle	Roosting			-		-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D	Spawn	Eggs	Larvae	Juveniles	Adults
1687	Diadromous	American shad	Nursery Area			-		-	-	May-Jul	May-Oct	Mar-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-		-	-	-	-	-
1741	Plant	Threatened plant	Vulnerable Occurrence	T/-		-		-	-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D	Spawn	Eggs	Larvae	Juveniles	Adults
1829	Insect	Federally threatened insect 2	Vulnerable Occurrence	E/-	T	-		Jun-Aug	Jun-Jul	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

FISH

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	White perch													-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	213.46	0.33
10B	Freshwater Marshes	33.33	0.05
10C	Swamps	591.68	0.92
10D	Scrub and Shrub Wetlands	149.70	0.23

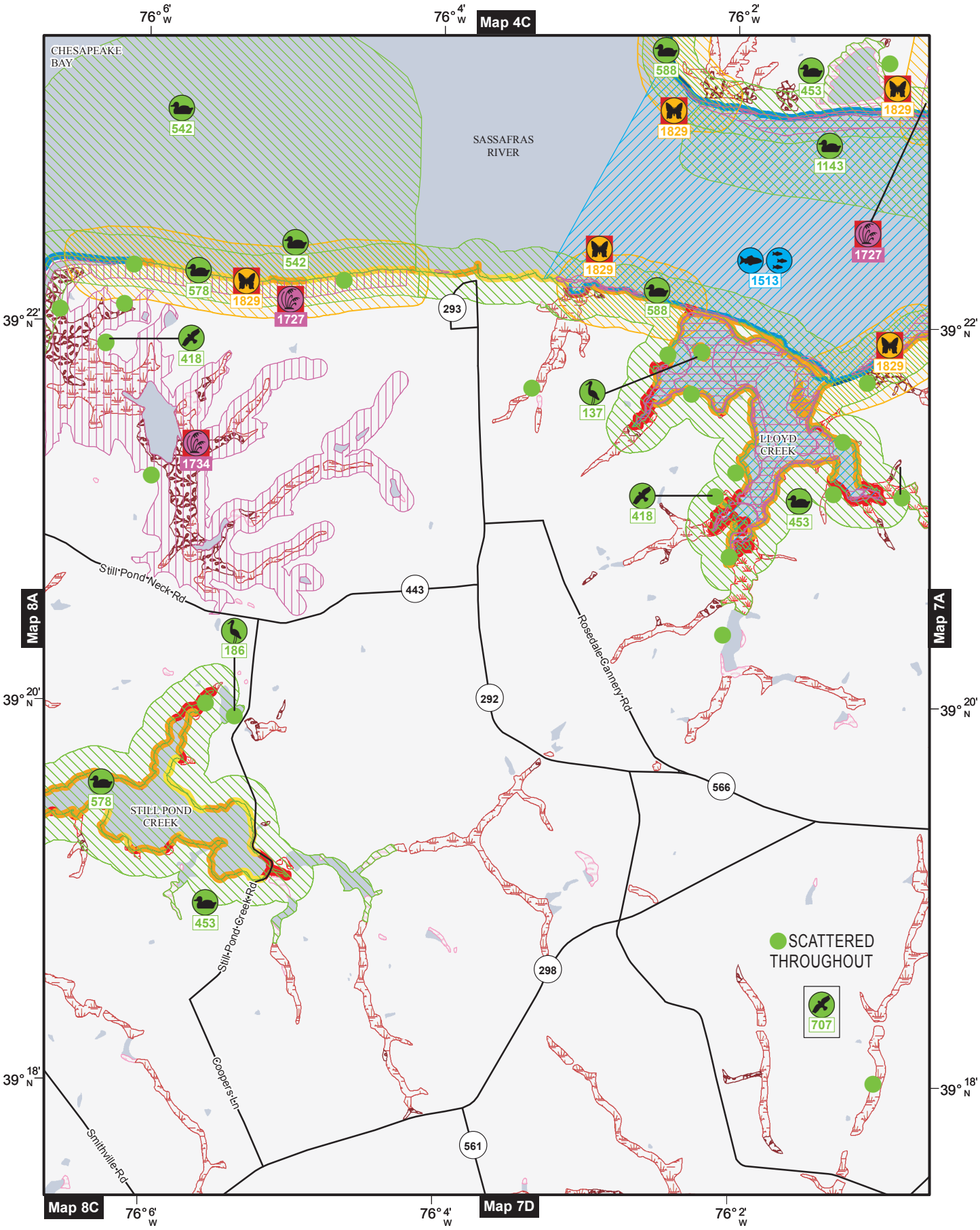
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	20,859.43	12.96	23%
10B	Freshwater Marshes	3,223.12	2.00	4%
10C	Swamps	22,666.74	14.08	25%
10D	Scrub and Shrub Wetlands	2,540.50	1.58	3%
9B	Vegetated Low Banks	24,430.39	15.18	27%
8B	Sheltered, Solid Man-Made Structures	3,416.19	2.12	4%
8C	Sheltered Riprap	4,464.34	2.77	5%
4	Coarse Grained Sand Beaches	6,896.82	4.29	8%
3B	Scarps and Steep Slopes (Sand)	1,983.00	1.23	2%

Total ESI Shoreline:	90,480.52	Total ESI Shoreline:	56.22
Total Shoreline:	80,825.42	Total Shoreline:	50.22

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 7B

Chesapeake North

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

N

Map 7B
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
137	Wading	Great blue heron	Nesting			21 Nests													Feb-Jun	-	-	-	-
186	Wading	Great blue heron	Nesting			23 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
542	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			10S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			1,000S													-	-	-	-	-
578	Waterfowl	American coot	Wintering			Present													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			Present													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			10S													-	-	-	-	-
	Waterfowl	Green-winged teal	Wintering			Present													-	-	-	-	-
	Waterfowl	Wood duck	Wintering			Present													-	-	-	-	-
588	Waterfowl	American coot	Wintering			100S													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-	-
	Waterfowl	Northern pintail	Wintering			100S													-	-	-	-	-
	Waterfowl	Northern shoveler	Wintering			10S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1143	Waterfowl	Canvasback	Wintering			100S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1513	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
1734	Plant	Endangered plant	Vulnerable Occurrence	E/-		5 Species Present													-	-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1829	Insect	Federally threatened insect 2	Vulnerable Occurrence	E/-	T	-													Jun-Aug	Jun-Jul	Jan-Dec	-	Jun-Aug

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
	Bufflehead	Wintering			100S													-	-	-	-	-
	Canada goose	Wintering			10,000S													-	-	-	-	-
	Common goldeneye	Wintering			10S													-	-	-	-	-
	Mallard	Wintering			1,000S													-	-	-	-	-
	Mergansers	Wintering			1,000S													-	-	-	-	-
	Tundra swan	Wintering			100S													-	-	-	-	-

FISH

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

TERRESTRIAL MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J F M A M J J A S O N D				
Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-	-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J F M A M J J A S O N D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife		Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel		-	-	-	Jan-May	Jan-Dec
	Blueback herring		Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad		Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad		Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass		-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic menhaden		-	-	-	May-Nov	May-Oct
	White perch		-	-	-	Jan-Dec	Jan-Dec
Estuarine Resident	Silversides		Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies		Apr-Sep	-	-	-	Jan-Dec
Freshwater	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
	Shorthead redhorse		Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass		Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner		Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner		May-Aug	-	-	-	Jan-Dec
	Sunfish		Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter		Apr-Jun	-	-	-	Jan-Dec
	White crappie		-	-	-	-	Jan-Dec
	Yellow perch		-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

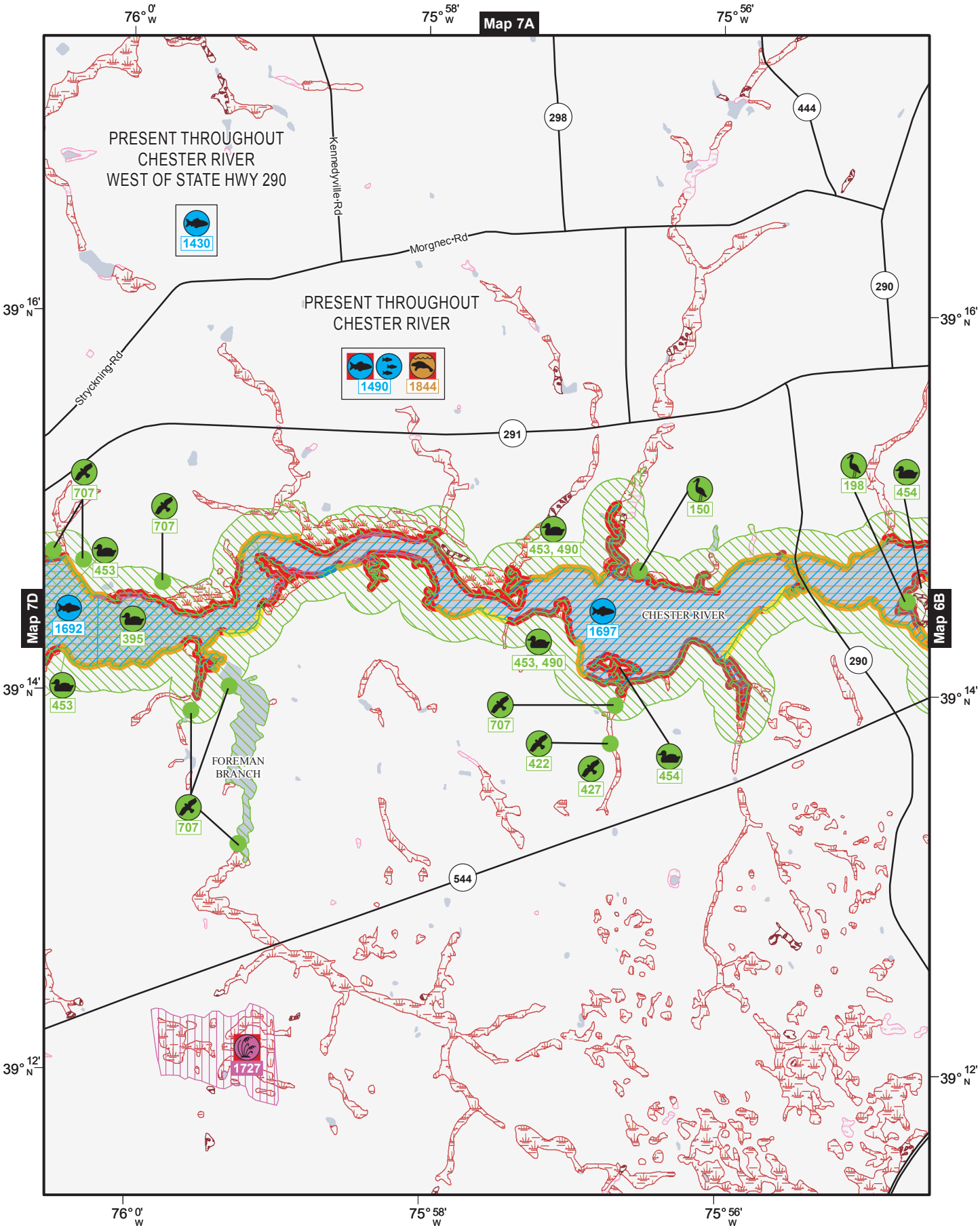
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	112.06	0.18
10B	Freshwater Marshes	100.35	0.16
10C	Swamps	693.56	1.08
10D	Scrub and Shrub Wetlands	253.79	0.40
9A	Sheltered Tidal Flats	13.21	0.02

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	8,227.97	5.11	20%
10C	Swamps	416.86	0.26	1%
9A	Sheltered Tidal Flats	229.74	0.14	1%
9B	Vegetated Low Banks	17,166.09	10.67	42%
8B	Sheltered, Solid Man-Made Structures	1,927.41	1.20	5%
8C	Sheltered Riprap	3,996.13	2.48	10%
4	Coarse Grained Sand Beaches	7,787.79	4.84	19%
3B	Scarps and Steep Slopes (Sand)	852.55	0.53	2%
	Total ESI Shoreline:	40,604.54	Total ESI Shoreline:	25.23
	Total Shoreline:	36,270.46	Total Shoreline:	22.54

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

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



Map 7C

Chesapeake North

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

N

Map 7C
Chesapeake North

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

Nest	Mig.(S)	Mig.(F)	Molt	
-	-	-	-	-

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
150	Wading	Great blue heron	Nesting			10 Nests													Feb-Jun	-	-	-	-
198	Wading	Great blue heron	Nesting			46 Nests													Feb-Jun	-	-	-	-
395	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			100S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			1,000S													-	-	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-	-
427	Raptor	Bald eagle	Nesting			Last Obs. 1994													Feb-Apr	-	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
454	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
490	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1430	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
1490	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			Weak Run													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1692	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	Feb-Jun
1697	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			Strong Run													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			Strong Run													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			Moderate Run													Apr-May	Apr-May	-	-	Feb-Jun

HABITATS & RARE PLANTS

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

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
		American coot	Wintering			Present													-	-	-	-	-
		American wigeon	Wintering			100S													-	-	-	-	-
		Gadwall	Wintering			1,000S													-	-	-	-	-
		Green-winged teal	Wintering			1,000S													-	-	-	-	-
		Mallard	Wintering			10,000S													-	-	-	-	-
		Northern pintail	Wintering			100S													-	-	-	-	-
		Northern shoveler	Wintering			100S													-	-	-	-	-

TERRESTRIAL MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	White perch													-	-	-	Jan-Dec	Jan-Dec
Freshwater	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
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	236.38	0.37
10B	Freshwater Marshes	70.22	0.11
10C	Swamps	1,336.06	2.09
10D	Scrub and Shrub Wetlands	68.79	0.11

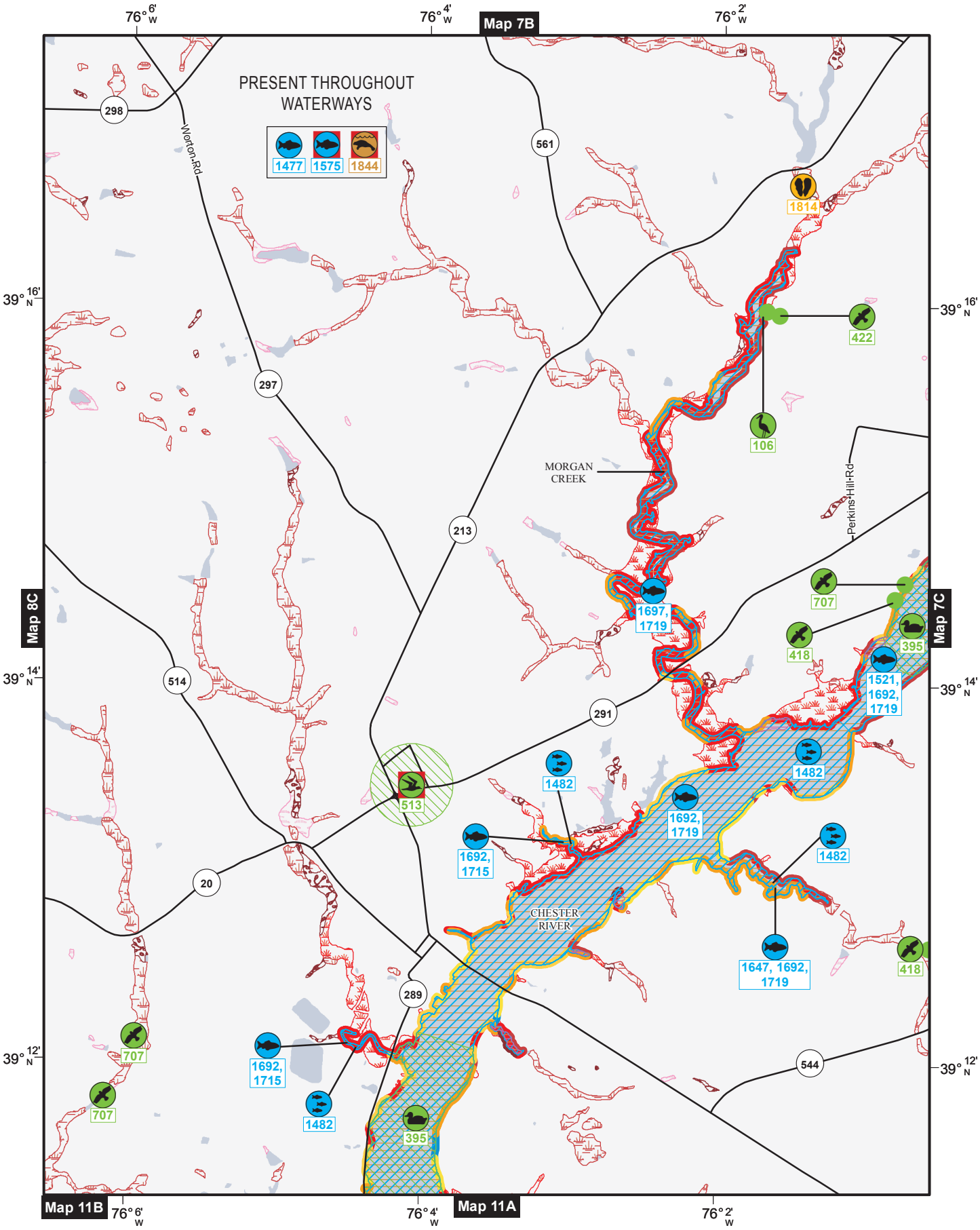
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	20,944.68	13.01	53%
10B	Freshwater Marshes	62.38	0.04	< 1%
10C	Swamps	6,952.64	4.32	18%
10D	Scrub and Shrub Wetlands	120.63	0.07	< 1%
9B	Vegetated Low Banks	9,586.92	5.96	24%
8B	Sheltered, Solid Man-Made Structures	1,501.67	0.93	4%
8C	Sheltered Riprap	110.96	0.07	< 1%
4	Coarse Grained Sand Beaches	135.23	0.08	< 1%

Total ESI Shoreline:	39,415.10	Total ESI Shoreline:	24.49
Total Shoreline:	38,180.34	Total Shoreline:	23.72

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 7D

Chesapeake North

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

N

Map 7D
Chesapeake North

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

Subelement	Species	Mapping Qualifier	Spawn	Eggs	Larvae	Juveniles	Adults
SAV	Submerged aquatic veg	High Ecological Value	-	-	-	-	-

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
106	Wading	Great blue heron	Nesting			34 Nests													Feb-Jun	-	-	-	-
395	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			100S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			1,000S													-	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-	-
513	Gull/Tern	Least tern	Nesting	T/-		56 Pairs													May-Aug	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1477	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
1482	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
1521	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1575	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
1647	Diadromous	Hickory shad	Migration			Moderate Run													-	-	-	Jun-Oct	Feb-Jun
1692	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	Feb-Jun
1697	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			Strong Run													Mar-May	Mar-May	-	-	Mar-May

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			Strong Run													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			Moderate Run													Apr-May	Apr-May	-	-	Feb-Jun
1715	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
1719	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			Weak Run													Apr-Jun	Apr-Jun	-	-	Mar-Jun

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1814	Bivalve	Eastern elliptio	Vulnerable Occurrence			-													-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
		American coot	Wintering			Present													-	-	-	-	-
		American wigeon	Wintering			100S													-	-	-	-	-
		Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
		Gadwall	Wintering			1,000S													-	-	-	-	-
		Green-winged teal	Wintering			1,000S													-	-	-	-	-
		Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
		Mallard	Wintering			10,000S													-	-	-	-	-
		Northern pintail	Wintering			100S													-	-	-	-	-
		Northern shoveler	Wintering			100S													-	-	-	-	-
		Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-

TERRESTRIAL MAMMALS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
	Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	White perch													-	-	-	Jan-Dec	Jan-Dec
Freshwater	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
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-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

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	470.89	0.74
10B	Freshwater Marshes	72.32	0.11
10C	Swamps	742.87	1.16
10D	Scrub and Shrub Wetlands	102.88	0.16

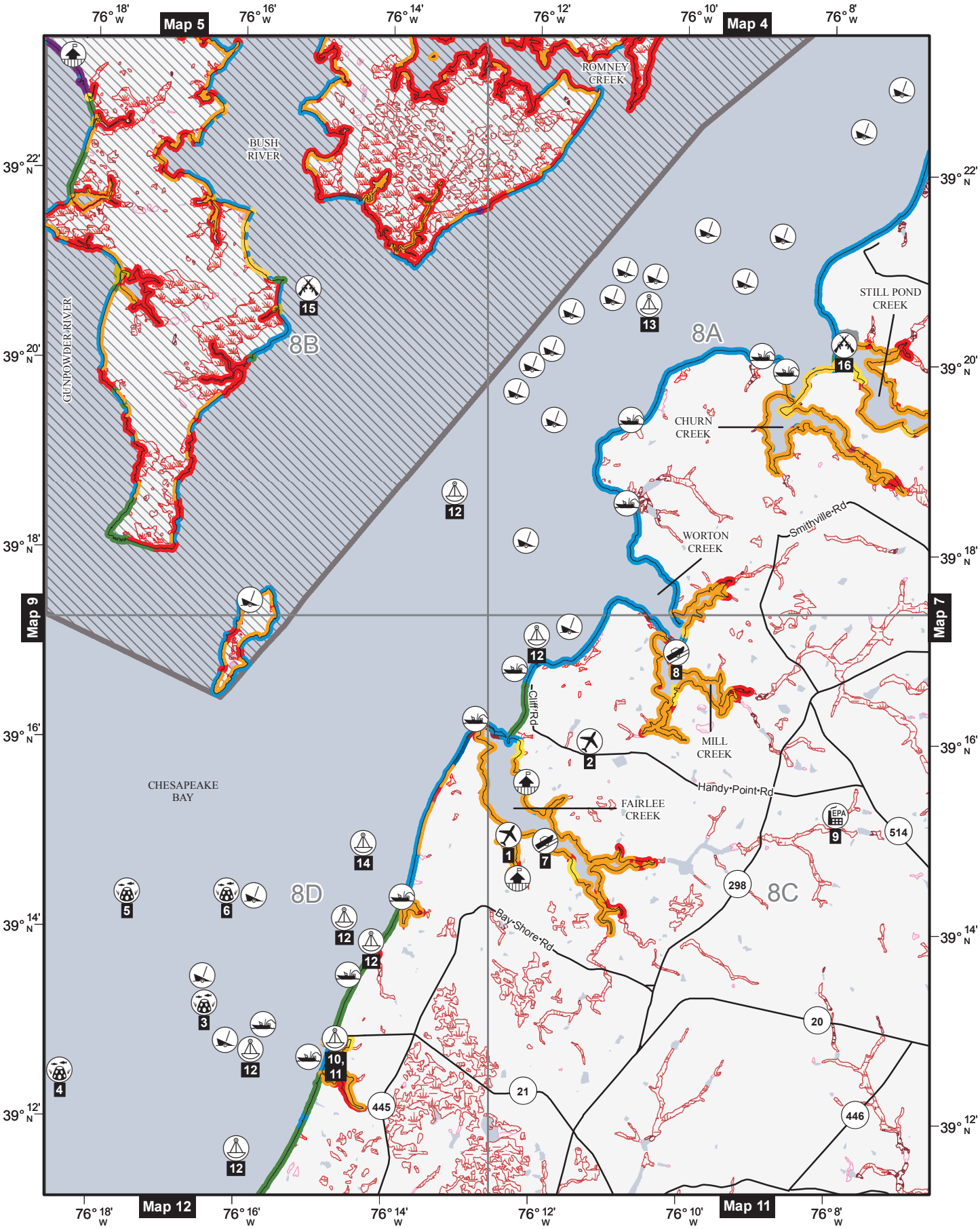
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	26,059.80	16.19	52%
10C	Swamps	6,515.18	4.05	13%
10D	Scrub and Shrub Wetlands	430.07	0.27	1%
9B	Vegetated Low Banks	8,342.00	5.18	17%
8B	Sheltered, Solid Man-Made Structures	3,388.10	2.11	7%
8C	Sheltered Riprap	4,601.19	2.86	9%
4	Coarse Grained Sand Beaches	349.32	0.22	1%

Total ESI Shoreline:	49,685.66	Total ESI Shoreline:	30.87
Total Shoreline:	48,056.31	Total Shoreline:	29.86

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

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



Map 8

Chesapeake North

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

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Map 8
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	AIRPORT	BREEZECROFT		
2	AIRPORT	POND VIEW PVT		
3	ARTIFICIAL REEF	GALES LUMP FISH HAVEN		
4	ARTIFICIAL REEF	GALES LUMP OYSTER SANCTUARY		
5	ARTIFICIAL REEF	POOLES ISLAND		
6	ARTIFICIAL REEF	TOLCHESTER		
7	BOAT RAMP	BOAT RAMP		
8	BOAT RAMP	GREEN POINT LANDING	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
9	EPA FACILITY	SOD RUN WASTEWATER TREATMENT PLANT	SUPERINTENDENT	410-273-5617
10	REPEATED MEASUREMENT SITE	DB - NOS, 8573364 - TOLCHESTER BEACH, MD	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
11	REPEATED MEASUREMENT SITE	PORTS - TOLCHESTER BEACH, CHESAPEAKE BAY	PORTS PROGRAM	301-713-4392
12	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, CHESAPEAKE BAY	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
13	REPEATED MEASUREMENT SITE	WQ - STATION CB2.2	CHESAPEAKE BAY PROGRAM	800-968-7229
14	REPEATED MEASUREMENT SITE	WQ - STATION CB3.1	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
15	MILITARY	ABERDEEN PROVING GROUND		
16	MILITARY	COAST GUARD STATION STILLPOND		

ALSO PRESENT IN MAPPED AREA (POINTS)

Type	Name	Contact	Phone
COAST GUARD	STA STILLPOND		410-778-2201

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
STATE PROTECTED AREA	GALES LUMP SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	MAN O WAR/GALES LUMP SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367

JURISDICTIONS

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	2,918.14	4.56
10B	Freshwater Marshes	152.30	0.24
10C	Swamps	2,519.11	3.94
10D	Scrub and Shrub Wetlands	139.32	0.22
7	Exposed Tidal Flats	14.18	0.02

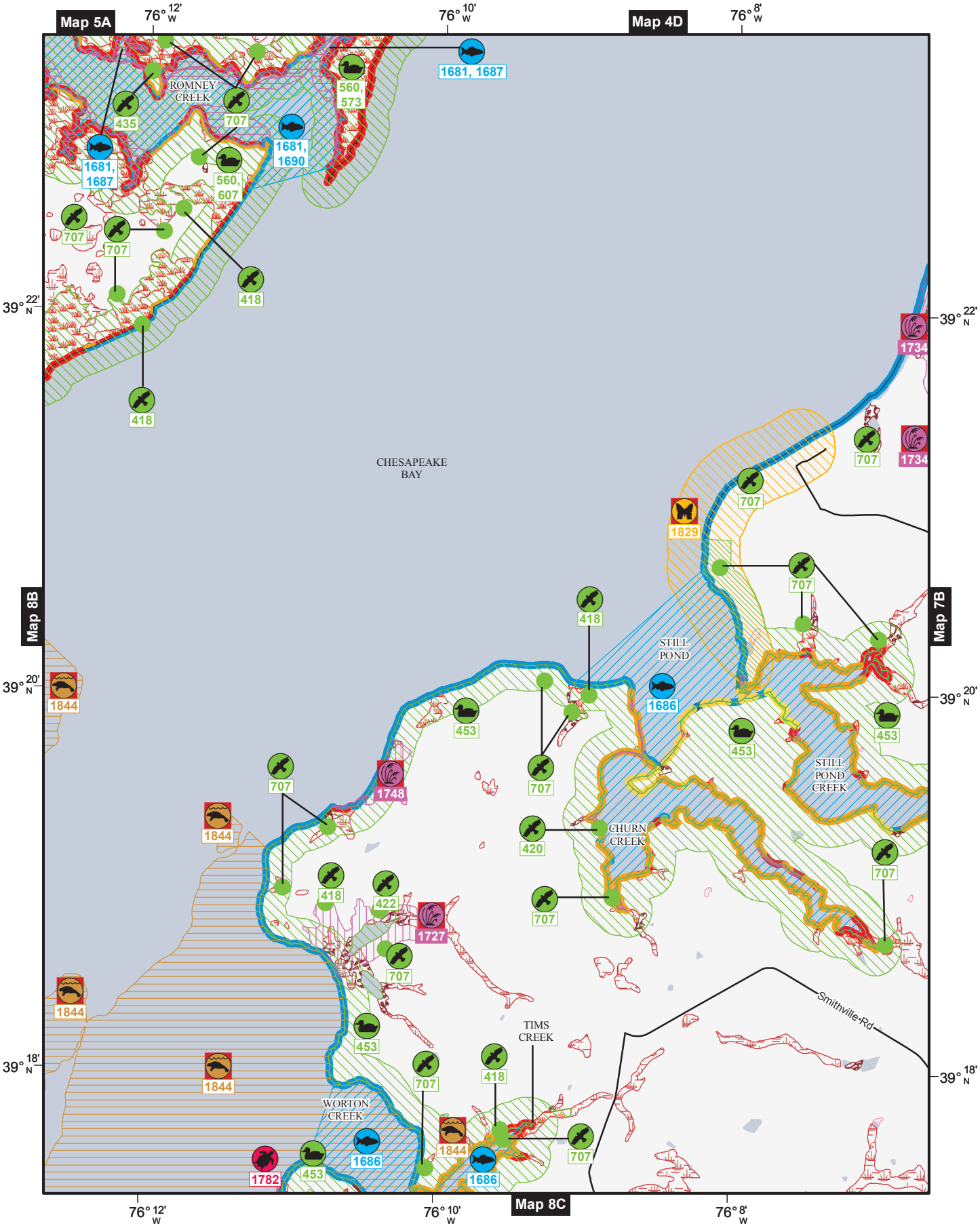
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	93,124.23	57.86	35%
10B	Freshwater Marshes	103.88	0.06	< 1%
10C	Swamps	984.22	0.61	< 1%
10D	Scrub and Shrub Wetlands	1,966.52	1.22	1%
9A	Sheltered Tidal Flats	19,796.59	12.30	7%
9B	Vegetated Low Banks	72,502.53	45.05	27%
8B	Sheltered, Solid Man-Made Structures	3,729.02	2.32	1%
8C	Sheltered Riprap	4,350.74	2.70	2%
7	Exposed Tidal Flats	2,047.05	1.27	1%
6B	Riprap	10,369.70	6.44	4%
4	Coarse Grained Sand Beaches	55,177.77	34.29	21%
3B	Scarps and Steep Slopes (Sand)	892.11	0.55	< 1%
1B	Exposed, Solid Man-Made Structures	1,819.79	1.13	1%

Total ESI Shoreline:	266,864.15	Total ESI Shoreline:	165.82
Total Shoreline:	204,438.21	Total Shoreline:	127.03

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 8A

Chesapeake North

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

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Map 8A
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
420	Raptor	Bald eagle	Nesting			Last Obs. 2002													Feb-Apr	-	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-	-
435	Raptor	Bald eagle	Nesting			Last Obs. 2008													Feb-Apr	-	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
560	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-	-	-
573	Waterfowl	American coot	Wintering			1,000S													-	-	-	-	-
607	Waterfowl	American coot	Wintering			100S													-	-	-	-	-
	Waterfowl	Green-winged teal	Wintering			10S													-	-	-	-	-
	Waterfowl	Northern pintail	Wintering			100S													-	-	-	-	-
	Waterfowl	Northern shoveler	Wintering			100S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1681	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
1686	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
1687	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
1690	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
1734	Plant	Endangered plant	Vulnerable Occurrence	E/-		5 Species Present													-	-	-	-	-
1748	Plant	Endangered plant	Vulnerable Occurrence	E/-		2 Species Present													-	-	-	-	-

REPTILES & AMPHIBIANS

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

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1829	Insect	Federally threatened insect 2	Vulnerable Occurrence	E/-	T	-													Jun-Aug	Jun-Jul	Jan-Dec	-	Jun-Aug

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
		American coot	Wintering			Present													-	-	-	-	-
		American wigeon	Wintering			Present													-	-	-	-	-
		Bufflehead	Wintering			100S													-	-	-	-	-
		Canada goose	Wintering			10,000S													-	-	-	-	-
		Canvasback	Wintering			1,000S													-	-	-	-	-
		Common goldeneye	Wintering			10S													-	-	-	-	-
		Gadwall	Wintering			10S													-	-	-	-	-
		Green-winged teal	Wintering			Present													-	-	-	-	-
		Mallard	Wintering			1,000S													-	-	-	-	-
		Mergansers	Wintering			1,000S													-	-	-	-	-
		Redhead	Wintering			10S													-	-	-	-	-
		Ruddy duck	Wintering			10S													-	-	-	-	-
		Scaup	Wintering			10,000S													-	-	-	-	-
		Snow goose	Wintering			1,000S													-	-	-	-	-
		Tundra swan	Wintering			100S													-	-	-	-	-
		Wood duck	Wintering			Present													-	-	-	-	-

FISH

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

TERRESTRIAL MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	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
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
Marine Benthic	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	531.55	0.83
10B	Freshwater Marshes	15.05	0.02
10C	Swamps	358.96	0.56
10D	Scrub and Shrub Wetlands	70.12	0.11

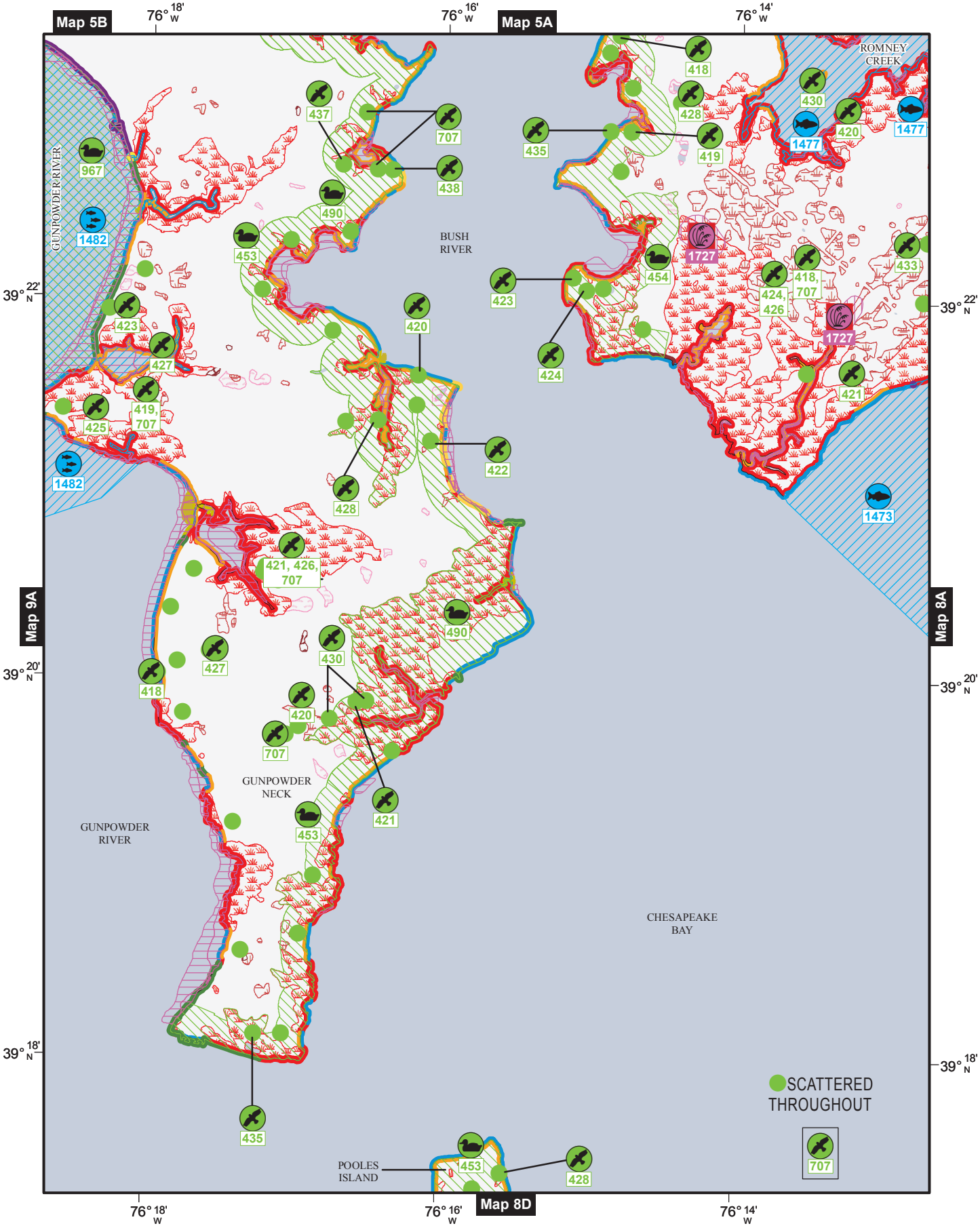
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	20,325.39	12.63	30%
10C	Swamps	613.46	0.38	1%
10D	Scrub and Shrub Wetlands	518.88	0.32	1%
9B	Vegetated Low Banks	21,914.45	13.62	33%
8B	Sheltered, Solid Man-Made Structures	615.85	0.38	1%
8C	Sheltered Riprap	2,191.20	1.36	3%
6B	Riprap	210.20	0.13	< 1%
4	Coarse Grained Sand Beaches	20,185.21	12.54	30%
3B	Scarps and Steep Slopes (Sand)	105.14	0.07	< 1%

Total ESI Shoreline:	66,679.78	Total ESI Shoreline:	41.43
Total Shoreline:	59,392.47	Total Shoreline:	36.90

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

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



Map 8B

Chesapeake North

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

N

Map 8B
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-
419	Raptor	Bald eagle	Nesting			Last Obs. 1999													Feb-Apr	-	-	-
420	Raptor	Bald eagle	Nesting			Last Obs. 2002													Feb-Apr	-	-	-
421	Raptor	Bald eagle	Nesting			Last Obs. 2001													Feb-Apr	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-
423	Raptor	Bald eagle	Nesting			Last Obs. 2000													Feb-Apr	-	-	-
424	Raptor	Bald eagle	Nesting			Last Obs. 1997													Feb-Apr	-	-	-
425	Raptor	Bald eagle	Nesting			Last Obs. 1998													Feb-Apr	-	-	-
426	Raptor	Bald eagle	Nesting			Last Obs. 1993													Feb-Apr	-	-	-
427	Raptor	Bald eagle	Nesting			Last Obs. 1994													Feb-Apr	-	-	-
428	Raptor	Bald eagle	Nesting			Last Obs. 2005													Feb-Apr	-	-	-
430	Raptor	Bald eagle	Nesting			Last Obs. 2007													Feb-Apr	-	-	-
433	Raptor	Bald eagle	Nesting			Last Obs. 1990													Feb-Apr	-	-	-
435	Raptor	Bald eagle	Nesting			Last Obs. 2008													Feb-Apr	-	-	-
437	Raptor	Bald eagle	Nesting			Last Obs. 1995													Feb-Apr	-	-	-
438	Raptor	Bald eagle	Nesting			Last Obs. 1996													Feb-Apr	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug
454	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug
490	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug
707	Raptor	Bald eagle	Roosting			-													-	-	-	-
967	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-	-

BIRDS (continued)

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

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1473	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
1477	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
1482	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May

HABITATS & RARE PLANTS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

FISH

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

INVERTEBRATES

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

MARINE MAMMALS

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

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

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jun	May-Jun	May-Jun	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
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	Jan-Dec	Jan-Dec
	Spotfin shiner													Jun-Aug	-	-	-	Jan-Dec
	Spottail shiner													May-Aug	-	-	-	Jan-Dec
	Sunfish													Mar-Jul	-	-	-	Jan-Dec
	Tessellated darter													Apr-Jun	-	-	-	Jan-Dec
	White crappie													-	-	-	-	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
Marine Benthic	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

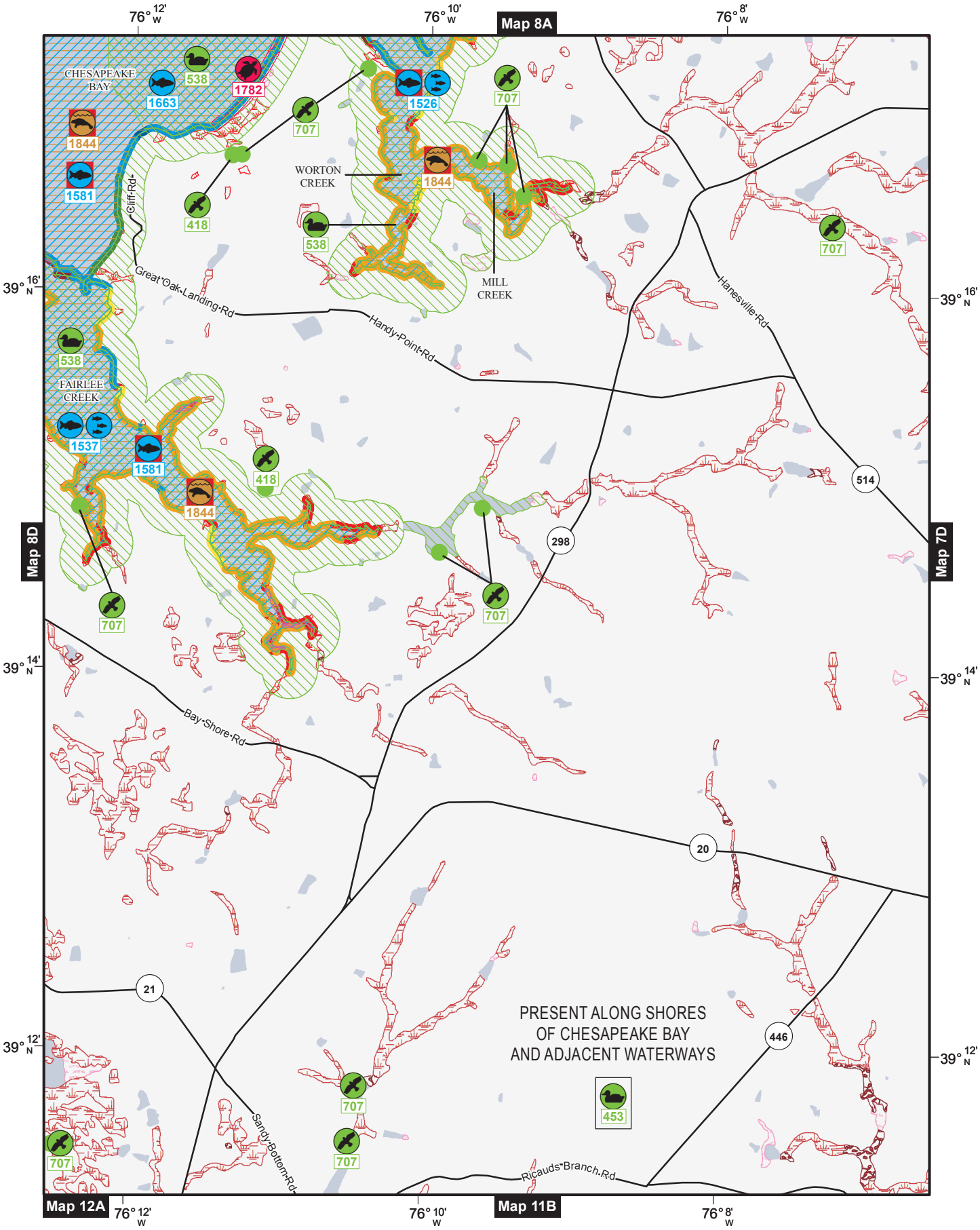
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	2,253.59	3.52
10B	Freshwater Marshes	57.98	0.09
10C	Swamps	352.75	0.55
10D	Scrub and Shrub Wetlands	6.48	0.01
7	Exposed Tidal Flats	14.18	0.02

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	61,158.19	38.00	47%
10B	Freshwater Marshes	59.40	0.04	< 1%
10C	Swamps	17.05	0.01	< 1%
10D	Scrub and Shrub Wetlands	449.52	0.28	< 1%
9A	Sheltered Tidal Flats	19,796.59	12.30	15%
9B	Vegetated Low Banks	19,627.10	12.20	15%
8B	Sheltered, Solid Man-Made Structures	69.95	0.04	< 1%
8C	Sheltered Riprap	1,437.71	0.89	1%
7	Exposed Tidal Flats	2,047.05	1.27	2%
6B	Riprap	3,962.10	2.46	3%
4	Coarse Grained Sand Beaches	20,168.98	12.53	15%
1B	Exposed, Solid Man-Made Structures	1,708.42	1.06	1%
	Total ESI Shoreline:	130,502.05	Total ESI Shoreline:	81.09
	Total Shoreline:	82,904.24	Total Shoreline:	51.51

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 8C

Chesapeake North

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

N

Map 8C
Chesapeake North

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

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt
Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-
Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug
Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug
Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug
Waterfowl	Bufflehead	Wintering			100S													-	-	-	-
Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-
Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-
Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-
Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-
Waterfowl	Redhead	Wintering			10S													-	-	-	-
Waterfowl	Ruddy duck	Wintering			10S													-	-	-	-
Waterfowl	Scaup	Wintering			10,000S													-	-	-	-
Waterfowl	Snow goose	Wintering			1,000S													-	-	-	-
Waterfowl	Tundra swan	Wintering			100S													-	-	-	-
Raptor	Bald eagle	Roosting			-													-	-	-	-

FISH

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

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1581	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
1663	Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Mar-May
	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Blueback herring	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Striped bass	Migration			-													-	-	-	-	Mar-Jun

REPTILES & AMPHIBIANS

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

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
		American coot	Wintering			Present													-	-	-	-	-
		American wigeon	Wintering			Present													-	-	-	-	-
		Gadwall	Wintering			10S													-	-	-	-	-
		Green-winged teal	Wintering			Present													-	-	-	-	-
		Mallard	Wintering			1,000S													-	-	-	-	-
		Wood duck	Wintering			Present													-	-	-	-	-

TERRESTRIAL MAMMALS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
	Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
Marine Benthic	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	79.39	0.12
10B	Freshwater Marshes	61.04	0.10
10C	Swamps	1,119.05	1.75
10D	Scrub and Shrub Wetlands	60.10	0.09

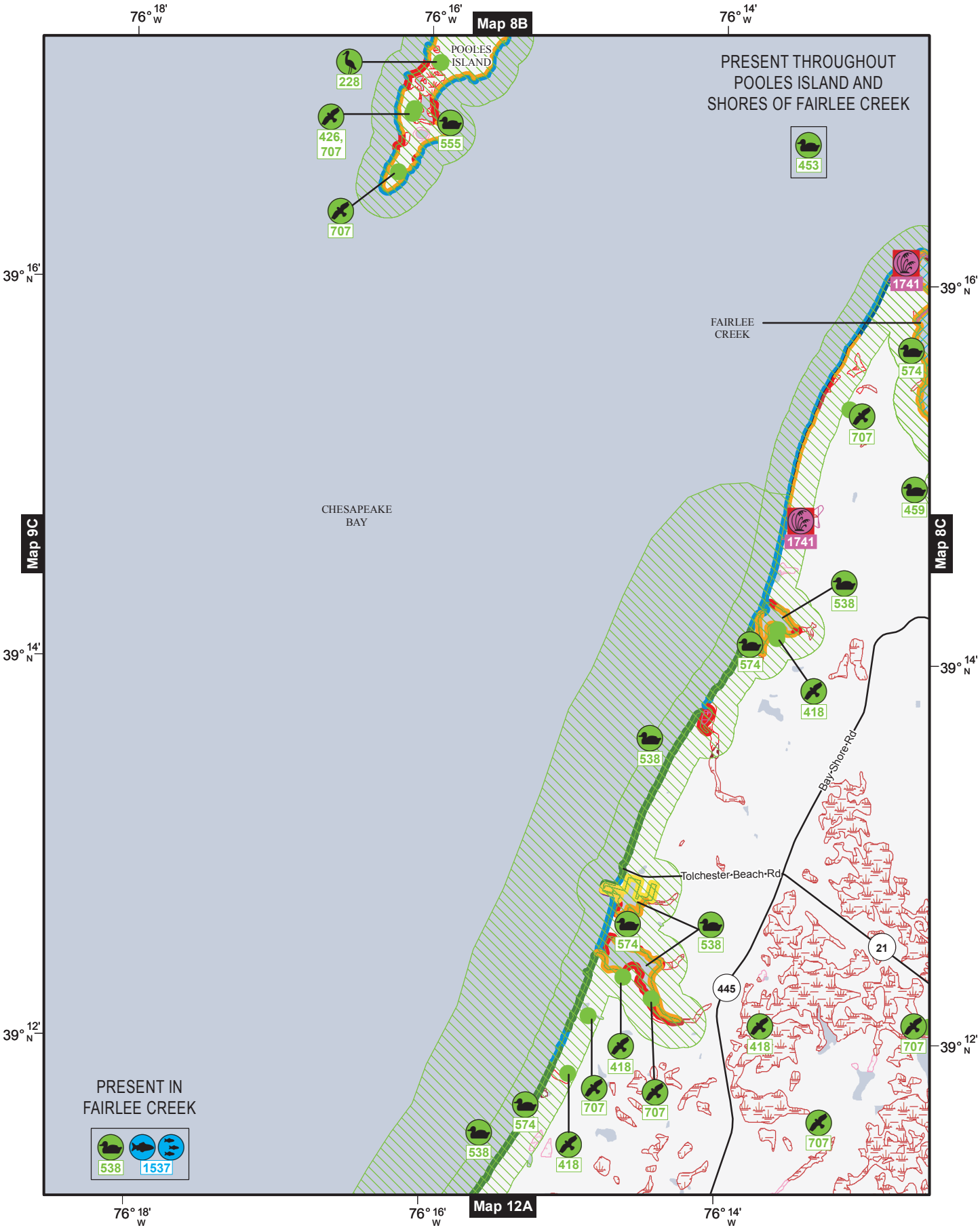
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	7,617.09	4.73	20%
10D	Scrub and Shrub Wetlands	476.20	0.30	1%
9B	Vegetated Low Banks	20,930.43	13.01	55%
8B	Sheltered, Solid Man-Made Structures	1,871.45	1.16	5%
8C	Sheltered Riprap	437.79	0.27	1%
6B	Riprap	844.06	0.52	2%
4	Coarse Grained Sand Beaches	5,511.21	3.42	15%
3B	Scarps and Steep Slopes (Sand)	192.40	0.12	1%

Total ESI Shoreline:	37,880.63	Total ESI Shoreline:	23.54
Total Shoreline:	37,457.72	Total Shoreline:	23.28

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 8D

Chesapeake North

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

N

Map 8D
Chesapeake North

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
228	Wading	Great blue heron	Nesting			1450 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
426	Raptor	Bald eagle	Nesting			Last Obs. 1993													Feb-Apr	-	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
459	Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
	Waterfowl	American coot	Wintering			Present													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			Present													-	-	-	-	-
	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Gadwall	Wintering			10S													-	-	-	-	-
	Waterfowl	Green-winged teal	Wintering			Present													-	-	-	-	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Mallard	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Wintering			Present													-	-	-	-	-
538	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			10S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-	-
555	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American coot	Wintering			100S													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Green-winged teal	Wintering			10S													-	-	-	-	-
	Waterfowl	Mallard	Wintering			1,000S													-	-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	Northern pintail	Wintering			100S													-	-	-	-	-
	Waterfowl	Northern shoveler	Wintering			100S													-	-	-	-	-
574	Waterfowl	American black duck	Wintering			100S													-	-	-	-	-
	Waterfowl	American coot	Wintering			Present													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			Present													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			10S													-	-	-	-	-
	Waterfowl	Green-winged teal	Wintering			Present													-	-	-	-	-
	Waterfowl	Mallard	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Wood duck	Wintering			Present													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1537	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1741	Plant	Threatened plant	Vulnerable Occurrence	T/-		-													-	-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

FISH

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

INVERTEBRATES

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

MARINE MAMMALS

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

TERRESTRIAL MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

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

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
Marine Benthic	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	53.61	0.08
10B	Freshwater Marshes	18.23	0.03
10C	Swamps	688.35	1.08
10D	Scrub and Shrub Wetlands	2.63	0.00

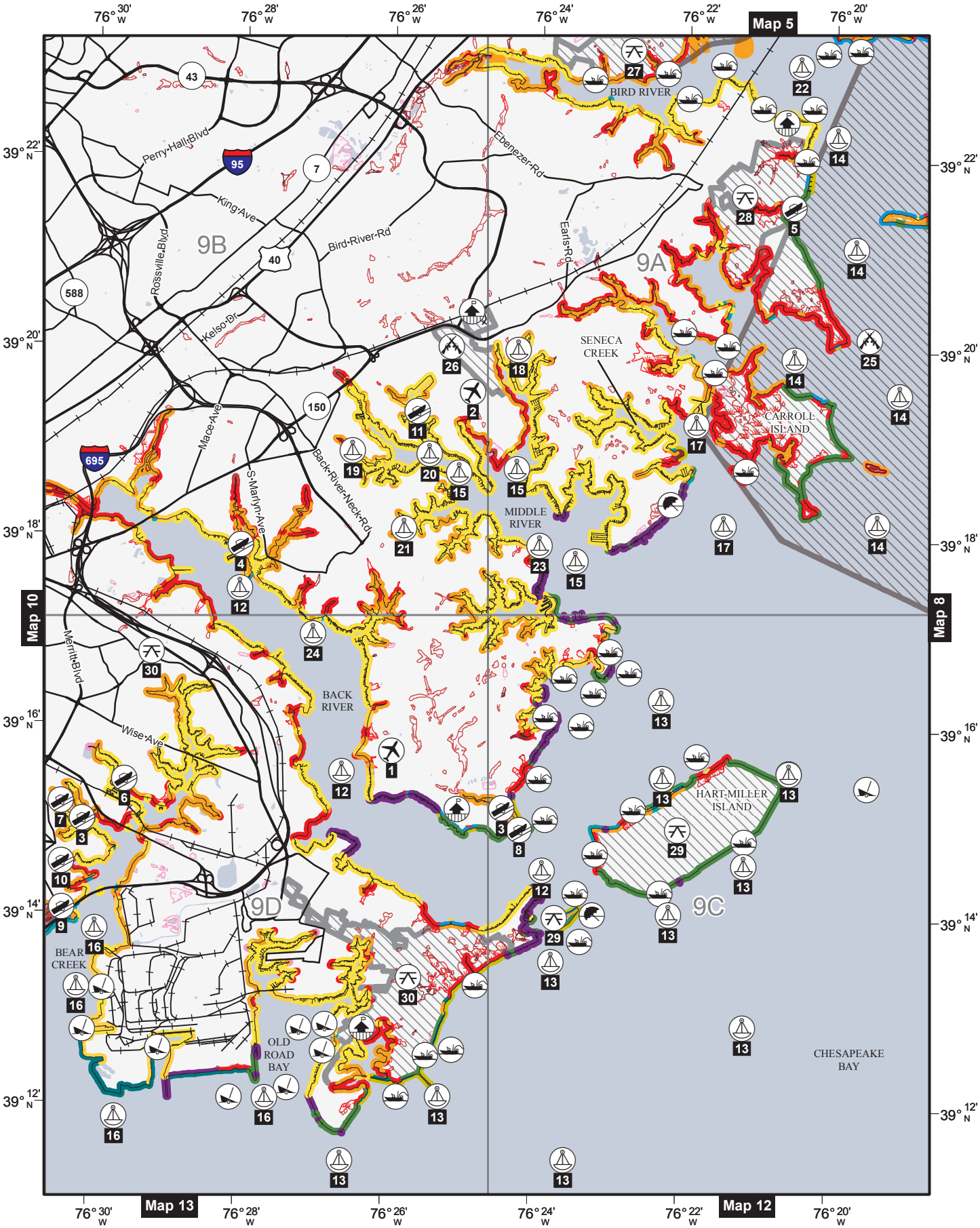
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	4,023.55	2.50	13%
10B	Freshwater Marshes	44.48	0.03	< 1%
10C	Swamps	353.72	0.22	1%
10D	Scrub and Shrub Wetlands	521.93	0.32	2%
9B	Vegetated Low Banks	10,030.55	6.23	32%
8B	Sheltered, Solid Man-Made Structures	1,171.78	0.73	4%
8C	Sheltered Riprap	284.03	0.18	1%
6B	Riprap	5,353.35	3.33	17%
4	Coarse Grained Sand Beaches	9,312.37	5.79	29%
3B	Scarps and Steep Slopes (Sand)	594.56	0.37	2%
1B	Exposed, Solid Man-Made Structures	111.37	0.07	< 1%

Total ESI Shoreline:	31,801.70	Total ESI Shoreline:	19.76
Total Shoreline:	24,683.78	Total Shoreline:	15.34

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 9

Chesapeake North

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

N

Map 9
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	AIRPORT	ESSEX SKYPARK		
2	AIRPORT	MARTIN STATE		
3	BOAT RAMP	BOAT RAMP		
4	BOAT RAMP	COX'S POINT PARK	BALTIMORE COUNTY - DEPT. OF REC. AND PARKS	
5	BOAT RAMP	HAMMERMAN SMALL BOAT	MARYLAND DNR - PARK SERVICE	
6	BOAT RAMP	INVERNESS PARK	BALTIMORE COUNTY - DEPT. OF REC. AND PARKS	
7	BOAT RAMP	MERRITT POINT PARK	BALTIMORE COUNTY - DEPT. OF REC. AND PARKS	
8	BOAT RAMP	ROCKY POINT PARK - OUTER	BALTIMORE COUNTY - DEPT. OF REC. AND PARKS	
9	BOAT RAMP	SOUTHWEST AREA PARK	BALTIMORE COUNTY - DEPT. OF REC. AND PARKS	
10	BOAT RAMP	TURNER STATION PARK	BALTIMORE COUNTY - DEPT. OF REC. AND PARKS	
11	BOAT RAMP	WILSON POINT PARK	BALTIMORE COUNTY - DEPT. OF REC. AND PARKS	
12	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, BACK RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
13	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, CHESAPEAKE BAY	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
14	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, GUNPOWDER RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
15	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, MIDDLE RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
16	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, PATAPSCO RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
17	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, SENECA CREEK	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
18	REPEATED MEASUREMENT SITE	WQ - STATION FRG0018	CHESAPEAKE BAY PROGRAM	800-968-7229
19	REPEATED MEASUREMENT SITE	WQ - STATION HOK0005	CHESAPEAKE BAY PROGRAM	800-968-7229
20	REPEATED MEASUREMENT SITE	WQ - STATION MDR0028	CHESAPEAKE BAY PROGRAM	800-968-7229
21	REPEATED MEASUREMENT SITE	WQ - STATION NOM0007	CHESAPEAKE BAY PROGRAM	800-968-7229
22	REPEATED MEASUREMENT SITE	WQ - STATION WT2.1	CHESAPEAKE BAY PROGRAM	800-968-7229
23	REPEATED MEASUREMENT SITE	WQ - STATION WT3.1	CHESAPEAKE BAY PROGRAM	800-968-7229
24	REPEATED MEASUREMENT SITE	WQ - STATION WT4.1	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
25	MILITARY	ABERDEEN PROVING GROUND		
26	MILITARY	MARTIN STATE ARPRT		
27	PARK	GUNPOWDER FALLS SP	MARYLAND PARK SERVICE	
28	PARK	HAMMERMAN AREA	MARYLAND PARK SERVICE	
29	PARK	HART, MILLER AND PLEASURE ISLANDS SP	MARYLAND PARK SERVICE	
30	PARK	NORTH POINT SP	MARYLAND PARK SERVICE	

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
STATE PROTECTED AREA	GALES LUMP SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	MAN O WAR/GALES LUMP SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367

JURISDICTIONS

COUNTY:	ANNE ARUNDEL COUNTY, BALTIMORE COUNTY, HARFORD COUNTY, KENT COUNTY	***FEMA:***	REGION I
COAST GUARD:	DISTRICT 5, SECTOR BALTIMORE	***EPA:***	REGION 3
USACE:	NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT		

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

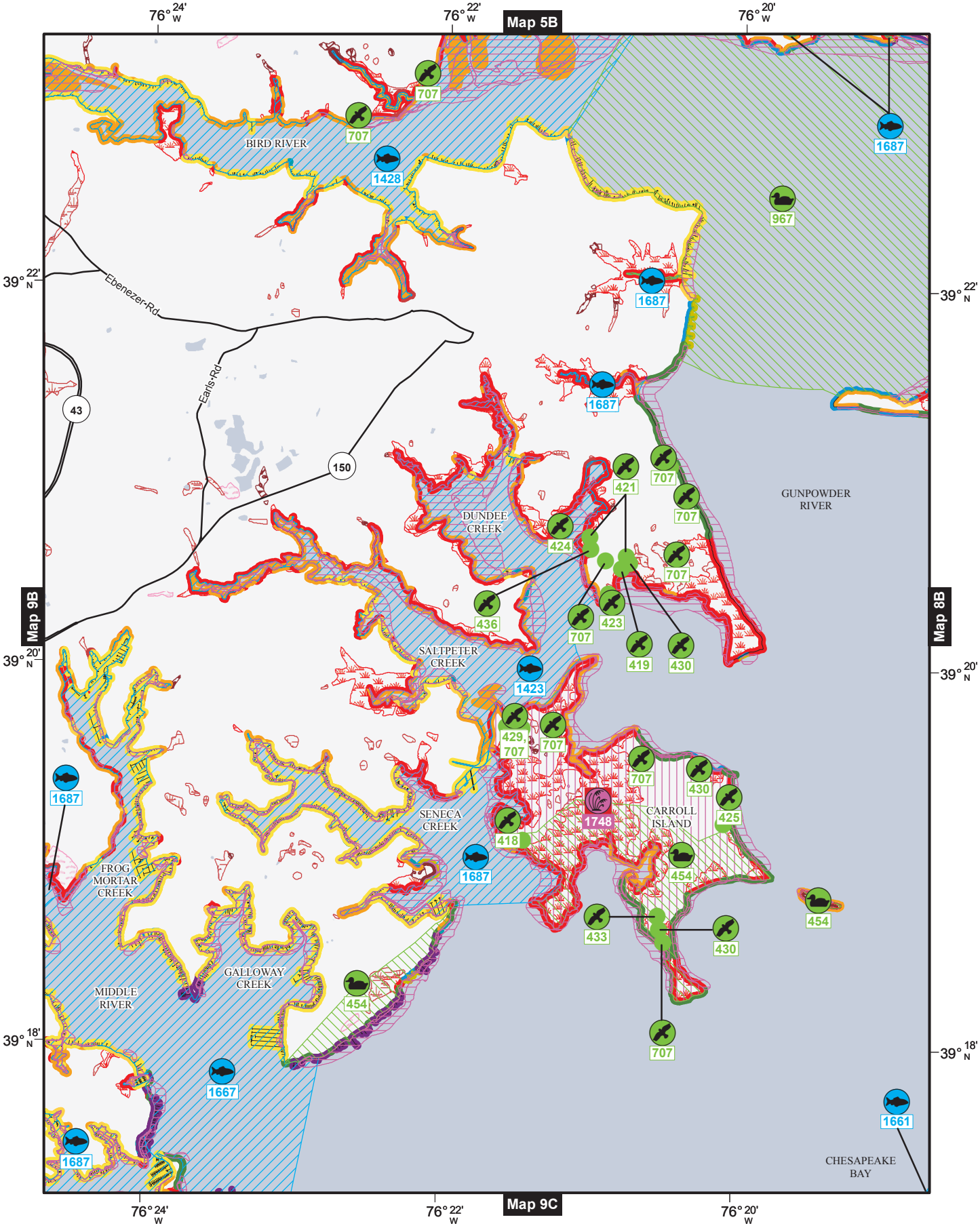
ESI Rank	*Habitat Classification*	*Area (Acres)*	*Area (Sq. Miles)*
10A	Salt and Brackish Water Marshes	1,529.12	2.39
10B	Freshwater Marshes	169.85	0.27
10C	Swamps	563.28	0.88
10D	Scrub and Shrub Wetlands	105.11	0.16
9A	Sheltered Tidal Flats	116.39	0.18

ESI SHORELINE HABITAT TYPES

ESI Rank	*Shoreline Habitat Classification*	*Length (Meters)*	*Length (Miles)*	*% of ESI Shoreline*
10A	Salt and Brackish Water Marshes	126,817.13	78.80	21%
10B	Freshwater Marshes	1,505.18	0.94	< 1%
10C	Swamps	3,537.09	2.20	1%
10D	Scrub and Shrub Wetlands	2,748.11	1.71	< 1%
9A	Sheltered Tidal Flats	40,554.63	25.20	7%
9B	Vegetated Low Banks	96,976.55	60.26	16%
8B	Sheltered, Solid Man-Made Structures	210,704.40	130.93	34%
8C	Sheltered Riprap	46,495.23	28.89	8%
7	Exposed Tidal Flats	11,045.69	6.86	2%
6A	Gravel Beaches	7,034.22	4.37	1%
6B	Riprap	31,715.54	19.71	5%
5	Mixed Sand and Gravel Beaches	5,153.51	3.20	1%
4	Coarse Grained Sand Beaches	9,045.68	5.62	1%
1B	Exposed, Solid Man-Made Structures	21,054.40	13.08	3%
	Total ESI Shoreline:	614,387.36	Total ESI Shoreline:	381.76
	Total Shoreline:	505,660.48	Total Shoreline:	314.20

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 9A

Chesapeake North

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

N

Map 9A
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
419	Raptor	Bald eagle	Nesting			Last Obs. 1999													Feb-Apr	-	-	-	-
421	Raptor	Bald eagle	Nesting			Last Obs. 2001													Feb-Apr	-	-	-	-
423	Raptor	Bald eagle	Nesting			Last Obs. 2000													Feb-Apr	-	-	-	-
424	Raptor	Bald eagle	Nesting			Last Obs. 1997													Feb-Apr	-	-	-	-
425	Raptor	Bald eagle	Nesting			Last Obs. 1998													Feb-Apr	-	-	-	-
429	Raptor	Bald eagle	Nesting			Last Obs. 2006													Feb-Apr	-	-	-	-
430	Raptor	Bald eagle	Nesting			Last Obs. 2007													Feb-Apr	-	-	-	-
433	Raptor	Bald eagle	Nesting			Last Obs. 1990													Feb-Apr	-	-	-	-
436	Raptor	Bald eagle	Nesting			Last Obs. 1991													Feb-Apr	-	-	-	-
454	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
967	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			100S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			10S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1423	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
1428	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
1661	Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Mar-May
	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Blueback herring	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
1667	Diadromous	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
1687	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D					
1748	Plant	Endangered plant	Vulnerable Occurrence	E/-		2 Species Present													-	-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

FISH

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

INVERTEBRATES

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

MARINE MAMMALS

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

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

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jun	May-Jun	May-Jun	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
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	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	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	930.82	1.45
10B	Freshwater Marshes	36.24	0.06
10C	Swamps	124.45	0.19
10D	Scrub and Shrub Wetlands	31.56	0.05
9A	Sheltered Tidal Flats	110.88	0.17

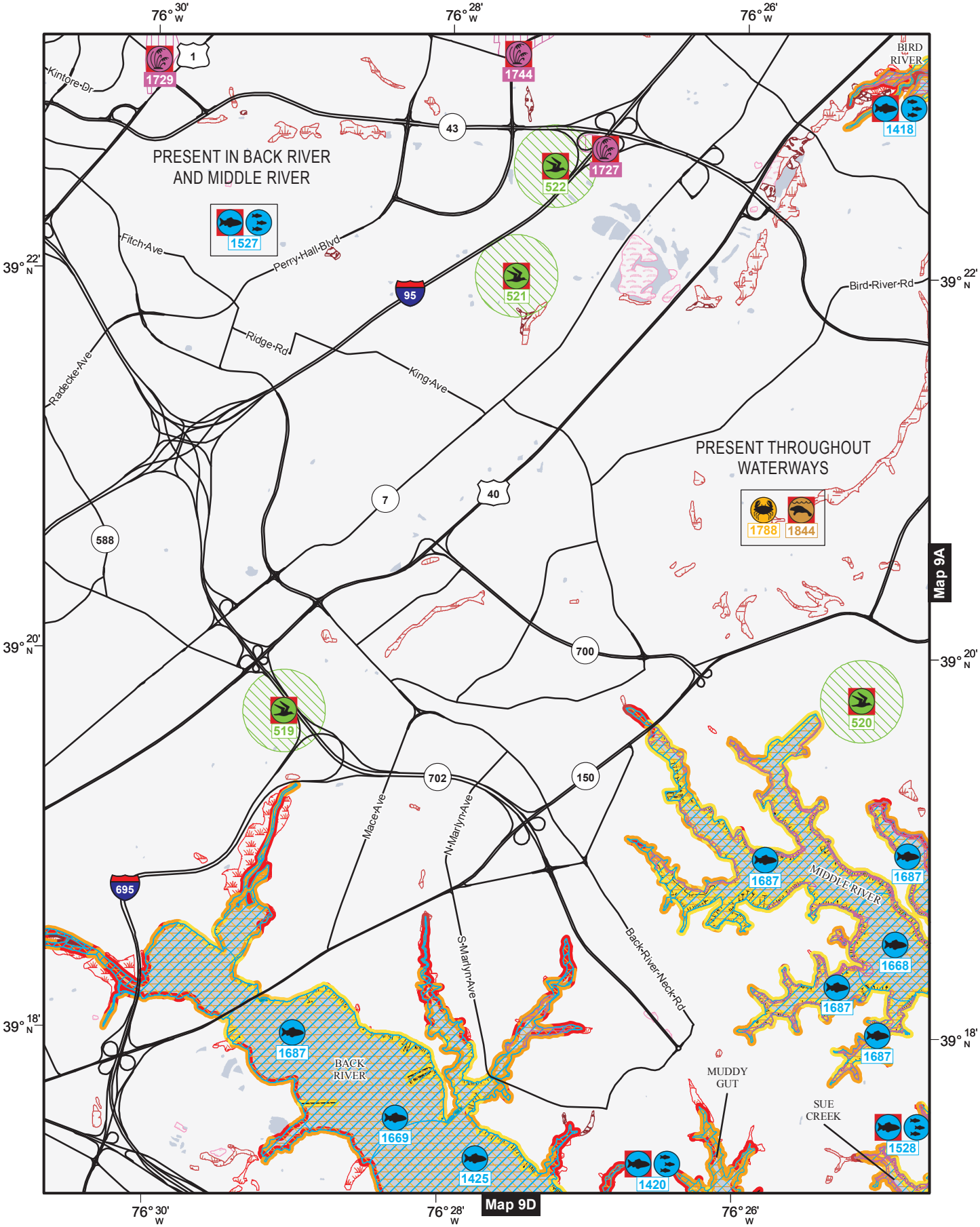
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	64,706.25	40.21	27%
10B	Freshwater Marshes	146.66	0.09	< 1%
10C	Swamps	804.10	0.50	< 1%
10D	Scrub and Shrub Wetlands	1,636.52	1.02	1%
9A	Sheltered Tidal Flats	33,699.44	20.94	14%
9B	Vegetated Low Banks	25,867.42	16.07	11%
8B	Sheltered, Solid Man-Made Structures	78,513.55	48.79	32%
8C	Sheltered Riprap	11,443.84	7.11	5%
7	Exposed Tidal Flats	1,823.95	1.13	1%
6B	Riprap	10,729.37	6.67	4%
5	Mixed Sand and Gravel Beaches	1,244.68	0.77	1%
4	Coarse Grained Sand Beaches	5,470.83	3.40	2%
1B	Exposed, Solid Man-Made Structures	5,882.83	3.66	2%

Total ESI Shoreline:	241,969.44	Total ESI Shoreline:	150.35
Total Shoreline:	183,790.39	Total Shoreline:	114.20

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 9B

Chesapeake North

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

N

Map 9B
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
519	Gull/Tern	Least tern	Nesting	T/-		115 Pairs													May-Aug	-	-	-	-
520	Gull/Tern	Least tern	Nesting	T/-		9 Pairs													May-Aug	-	-	-	-
521	Gull/Tern	Least tern	Nesting	T/-		30 Pairs													May-Aug	-	-	-	-
522	Gull/Tern	Least tern	Nesting	T/-		8 Pairs													May-Aug	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1418	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			-													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			-													Apr-May	Apr-May	-	-	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Migration			-													-	-	-	-	Mar-Jun
	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1420	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Migration			-													-	-	-	-	Mar-Jun
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1425	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
1527	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1528	Diadromous	Alewife	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			-													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1668	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
1669	Diadromous	Striped bass	Migration			-													-	-	-	-	Mar-Jun
1687	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1727	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
1729	Plant	Endangered plant	Vulnerable Occurrence	E/-		-													-	-	-	-	-
	Plant	Threatened plant	Vulnerable Occurrence	T/-		-													-	-	-	-	-
1744	Plant	Threatened plant	Vulnerable Occurrence	T/-		2 Species Present													-	-	-	-	-

INVERTEBRATES

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

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	American coot	Wintering			100S													-	-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-	-
	Green-winged teal	Wintering			10S													-	-	-	-	-
	Mallard	Wintering			1,000S													-	-	-	-	-
	Northern pintail	Wintering			100S													-	-	-	-	-
	Northern shoveler	Wintering			100S													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	White perch													-	-	-	Jan-Dec	Jan-Dec
Freshwater	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
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	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

INVERTEBRATES

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

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	182.96	0.29
10B	Freshwater Marshes	58.80	0.09
10C	Swamps	244.32	0.38
10D	Scrub and Shrub Wetlands	34.91	0.05
9A	Sheltered Tidal Flats	5.50	0.01

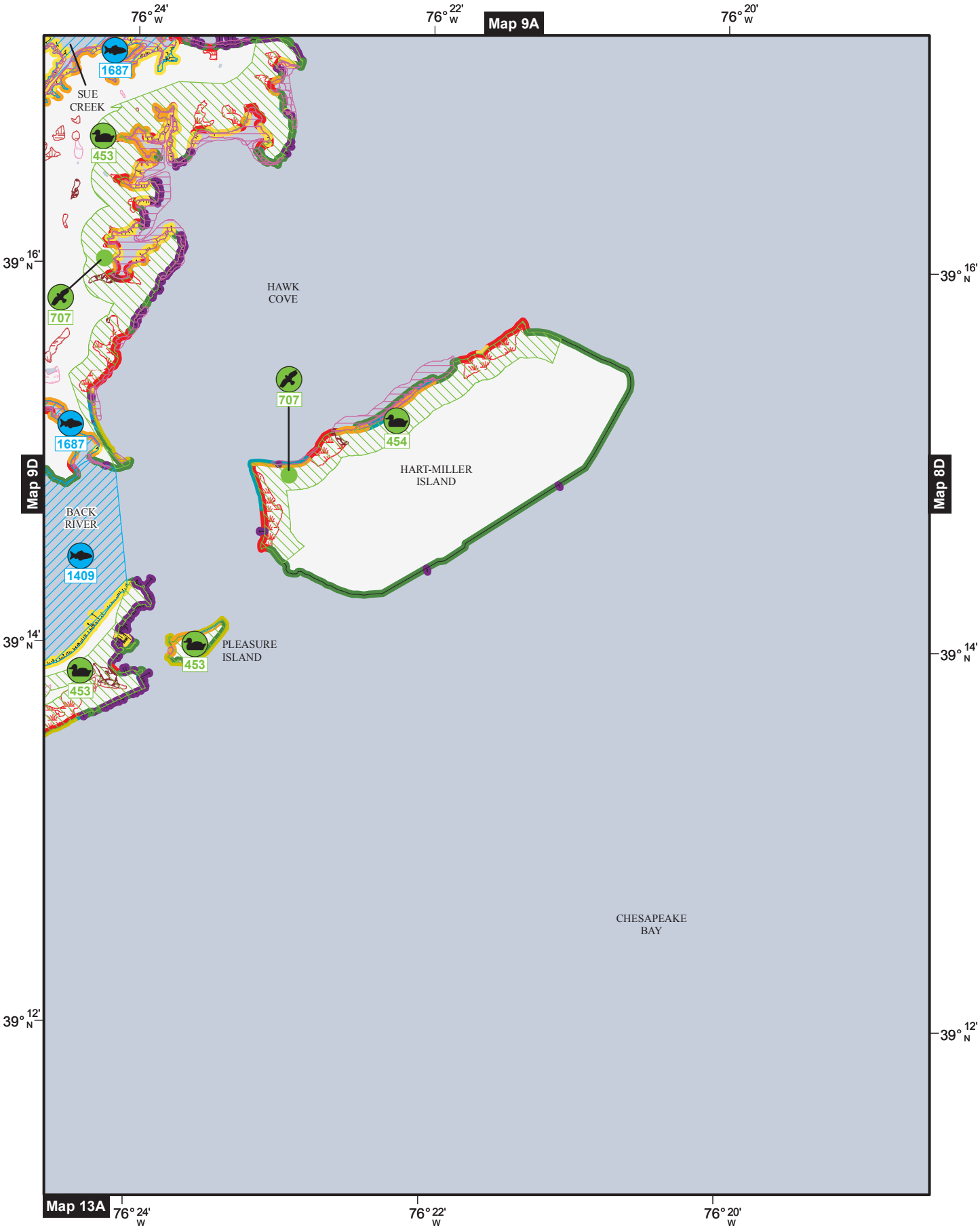
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	26,299.83	16.34	21%
10C	Swamps	2,058.58	1.28	2%
10D	Scrub and Shrub Wetlands	846.92	0.53	1%
9A	Sheltered Tidal Flats	6,855.19	4.26	6%
9B	Vegetated Low Banks	29,406.33	18.27	24%
8B	Sheltered, Solid Man-Made Structures	48,658.01	30.23	39%
8C	Sheltered Riprap	8,713.08	5.41	7%
5	Mixed Sand and Gravel Beaches	150.07	0.09	< 1%
4	Coarse Grained Sand Beaches	500.21	0.31	< 1%

Total ESI Shoreline:	123,488.22	Total ESI Shoreline:	76.73
Total Shoreline:	107,064.44	Total Shoreline:	66.53

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 9C

Chesapeake North

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

N

Map 9C
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
454	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1409	Diadromous	Hickory shad	Nursery Area			-													-	-	Apr-Jun	Apr-Oct	-
1687	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

BIRDS (continued)

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

FISH

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

INVERTEBRATES

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

MARINE MAMMALS

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jun	May-Jun	May-Jun	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
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	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	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	136.44	0.21
10B	Freshwater Marshes	8.09	0.01
10C	Swamps	20.31	0.03
10D	Scrub and Shrub Wetlands	13.49	0.02

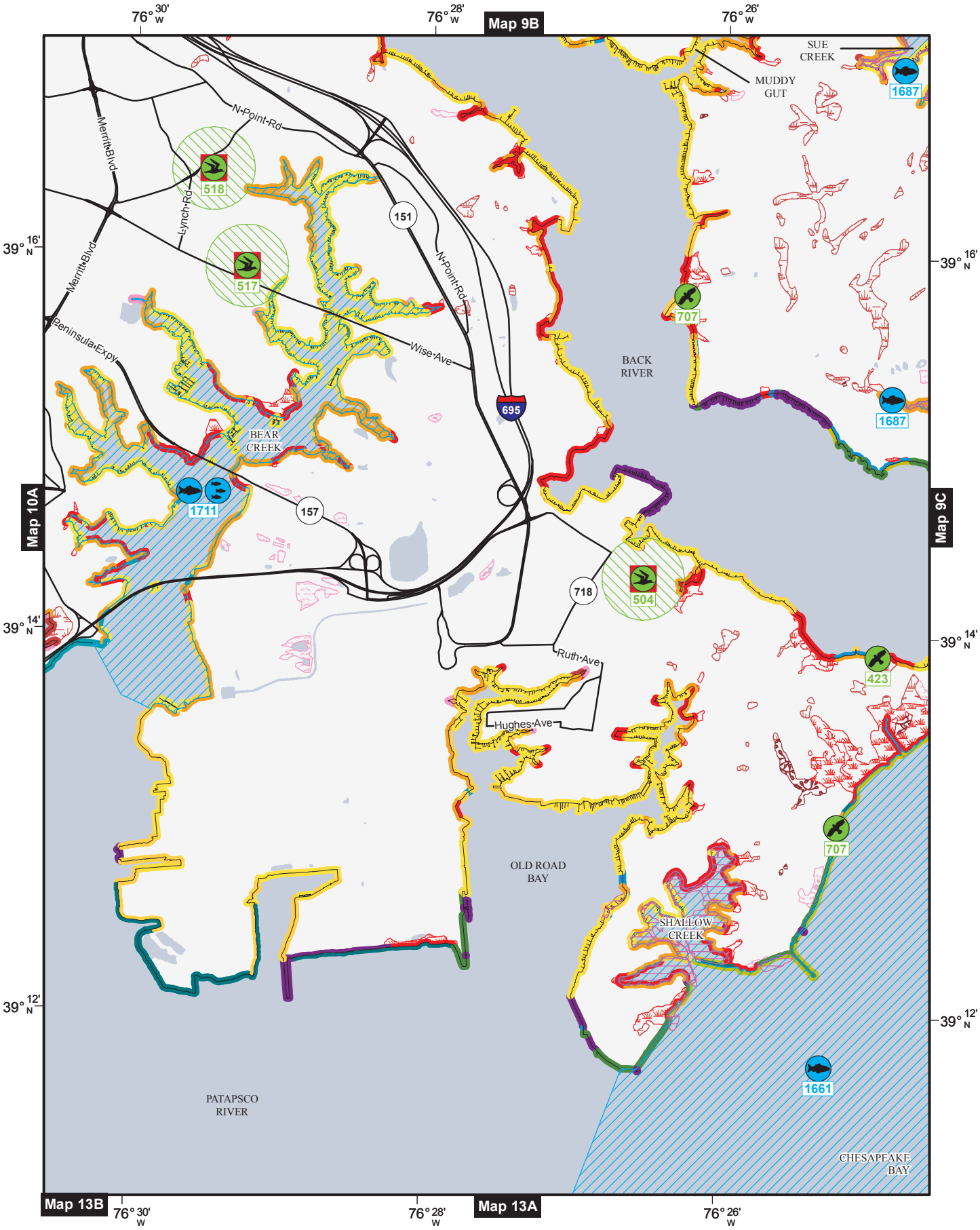
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	7,730.60	4.80	14%
10C	Swamps	57.56	0.04	< 1%
10D	Scrub and Shrub Wetlands	210.52	0.13	< 1%
9B	Vegetated Low Banks	8,429.99	5.24	15%
8B	Sheltered, Solid Man-Made Structures	9,684.46	6.02	17%
8C	Sheltered Riprap	1,937.53	1.20	3%
7	Exposed Tidal Flats	2,949.63	1.83	5%
6B	Riprap	14,943.34	9.29	27%
5	Mixed Sand and Gravel Beaches	1,798.15	1.12	3%
4	Coarse Grained Sand Beaches	902.29	0.56	2%
1B	Exposed, Solid Man-Made Structures	7,367.97	4.58	13%

Total ESI Shoreline:	56,012.07	Total ESI Shoreline:	34.80
Total Shoreline:	49,808.15	Total Shoreline:	30.95

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 9D

Chesapeake North

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

N

Map 9D
Chesapeake North

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	MD/VA 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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
423	Raptor	Bald eagle	Nesting			Last Obs. 2000													Feb-Apr	-	-	-	-
504	Gull/Tern	Least tern	Nesting	T/-		17 Pairs													May-Aug	-	-	-	-
517	Gull/Tern	Least tern	Nesting	T/-		44 Pairs													May-Aug	-	-	-	-
518	Gull/Tern	Least tern	Nesting	T/-		15 Pairs													May-Aug	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1661	Diadromous	Alewife	Migration			-													-	-	-	Aug-Nov	Mar-May
	Diadromous	American shad	Migration			-													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Blueback herring	Migration			-													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Hickory shad	Migration			-													-	-	-	Jun-Oct	Feb-Jun
1687	Diadromous	American shad	Nursery Area			-													-	-	May-Jul	May-Oct	Mar-Jun
1711	Estuarine Nursery	White perch	Spawning Area			Historical Spawning													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			Historical Spawning													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

BIRDS (continued)

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

FISH

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

INVERTEBRATES

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

MARINE MAMMALS

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jun	May-Jun	May-Jun	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
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	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	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

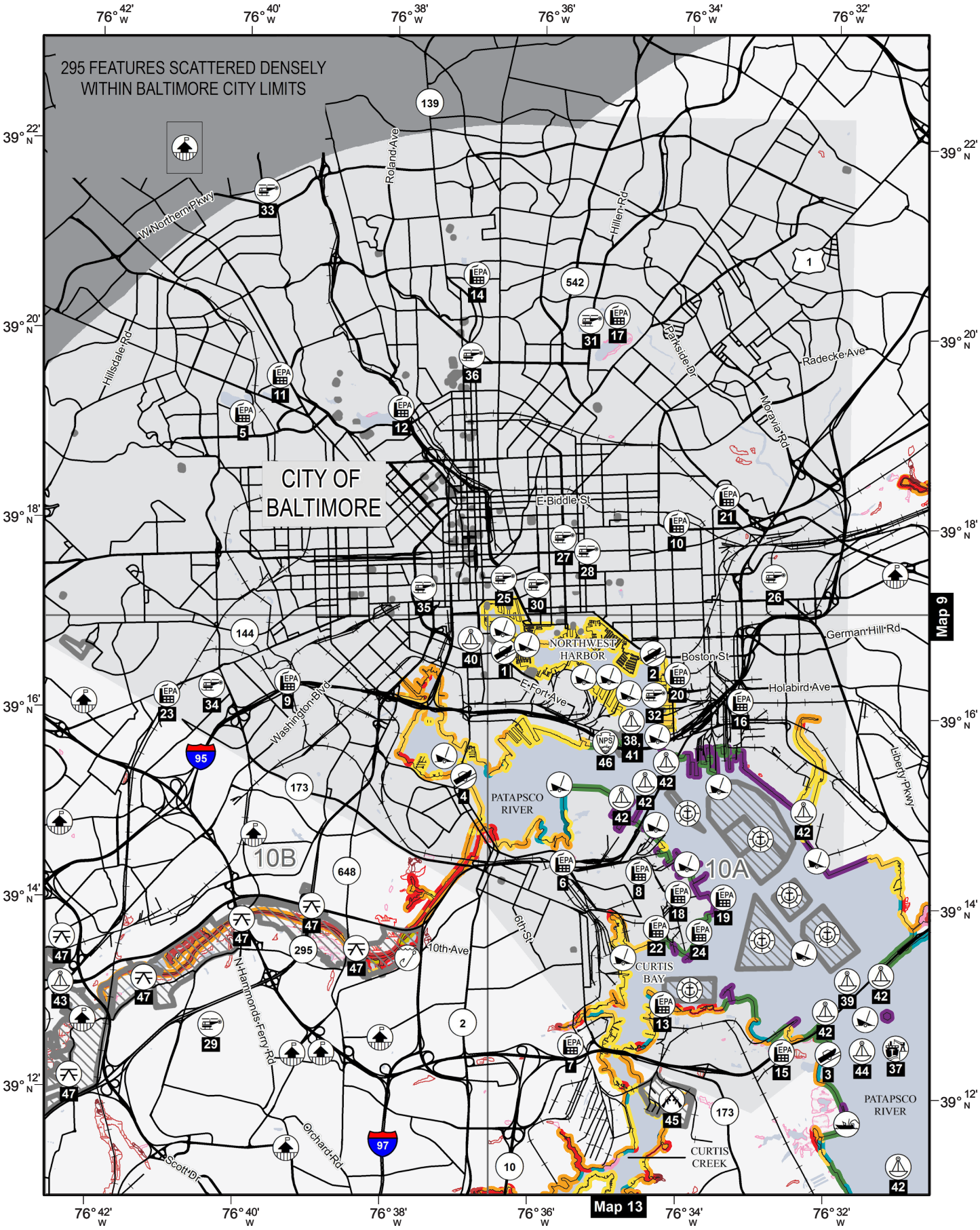
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	278.89	0.44
10B	Freshwater Marshes	66.73	0.10
10C	Swamps	174.20	0.27
10D	Scrub and Shrub Wetlands	25.15	0.04

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	28,080.44	17.45	15%
10B	Freshwater Marshes	1,358.52	0.84	1%
10C	Swamps	616.84	0.38	< 1%
10D	Scrub and Shrub Wetlands	54.15	0.03	< 1%
9B	Vegetated Low Banks	33,272.81	20.67	17%
8B	Sheltered, Solid Man-Made Structures	73,848.38	45.89	38%
8C	Sheltered Riprap	24,400.78	15.16	13%
7	Exposed Tidal Flats	6,272.11	3.90	3%
6A	Gravel Beaches	7,034.22	4.37	4%
6B	Riprap	6,042.83	3.75	3%
5	Mixed Sand and Gravel Beaches	1,960.61	1.22	1%
4	Coarse Grained Sand Beaches	2,172.35	1.35	1%
1B	Exposed, Solid Man-Made Structures	7,803.60	4.85	4%
	Total ESI Shoreline:	192,917.63	Total ESI Shoreline:	119.87
	Total Shoreline:	164,997.49	Total Shoreline:	102.52

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 10

Chesapeake North

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 10
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	***Type***	***Name***	***Contact***	***Phone***
1	BOAT RAMP	BOAT RAMP		
2	BOAT RAMP	CANTON WATERFRONT PARK	BALTIMORE CITY - DEPT. OF REC. AND PARKS	
3	BOAT RAMP	FORT ARMISTEAD	BALTIMORE CITY - DEPT. OF REC. AND PARKS	
4	BOAT RAMP	MIDDLE BRANCH PARK - BROENING	BALTIMORE CITY - DEPT. OF REC. AND PARKS	
5	EPA FACILITY	ASHBURTON CHLORINATOR STATION	WATER TREATMENT ASSISTANT MANAGER	410-396-6091
6	EPA FACILITY	BALTIMORE LPG TERMINAL	TERMINAL MANAGER	443-694-9282
7	EPA FACILITY	BP PRODUCTS NORTH AMERICA INC.-CURTIS BAY TERMINAL	TERMINAL MANAGER	410-636-0522
8	EPA FACILITY	CENTER POINT TERMINAL BALTIMORE LLC	TERMINAL MANAGER	410-355-4500
9	EPA FACILITY	CLEAN HARBORS OF BALTIMORE, INC.	FACILITY COMPLIANCE MANAGER	410-244-8200
10	EPA FACILITY	CLOVERLAND GREEN SPRINGS DAIRY	PLANT ENGINEER	410-235-4477
11	EPA FACILITY	DIETZ AND WATSON INC	PLANT MANAGER	215-831-9000
12	EPA FACILITY	DRUID LAKE CHLORINATOR STATIONS	WATER TREATMENT ASSISTANT MANAGER	410-396-6091
13	EPA FACILITY	GRACE - DAVISON CURTIS BAY	OMC OPERATIONS MANAGER	410-354-8906
14	EPA FACILITY	GUILFORD CHLORINATOR STATION	WATER TREATMENT ASSISTANT MANAGER	410-396-6091
15	EPA FACILITY	KEMIRA WATER SOLUTIONS, INC.	PLANT MANAGER	410-354-3003
16	EPA FACILITY	MERCHANTS TERMINAL CORP.	DIRECTOR OF ENGINEERING	410-342-9300
17	EPA FACILITY	MONTEBELLO FILTRATION PLANT	WATER TREATMENT ASSISTANT MANAGER	410-396-6091
18	EPA FACILITY	MOTIVA BALTIMORE TERMINAL	COMPLEX MANAGER	410-354-4201
19	EPA FACILITY	PATAPSCO WASTEWATER TREATMENT FACILITY	PLANT MANAGER	410-396-2898
20	EPA FACILITY	PETROLEUM FUEL & TERMINAL COMPANY	TERMINAL MANAGER	410-342-7800
21	EPA FACILITY	PETROLEUM FUEL AND TERMINAL CO.	TERMINAL MANAGER	410-327-3808
22	EPA FACILITY	SUNOCO LOGISTICS BALTIMORE MD TERMINAL	TERMINAL SUPERVISOR	410-355-7200
23	EPA FACILITY	UNILEVER	MAINTENANCE MANAGER	773-610-7208
24	EPA FACILITY	USALCO BALTIMORE PLANT, LLC	EH&S MANAGER	410-354-0100
25	HELIPORT	BALTIMORE POLICE DEPARTMENT		
26	HELIPORT	JOHNS HOPKINS BAYVIEW MEDICAL CENTER		
27	HELIPORT	JOHNS HOPKINS HOSPITAL		
28	HELIPORT	JOHNS HOPKINS HOSPITAL CRIT CARE TOWER		
29	HELIPORT	MARITIME INSTITUTE		
30	HELIPORT	MARRIOTT PARKING GARAGE "ROOFTOP"		
31	HELIPORT	MONTEBELLO FILTRATION PLANT		
32	HELIPORT	PIER 7		
33	HELIPORT	SINAI II		
34	HELIPORT	ST. AGNES HEALTH CARE		
35	HELIPORT	UNI OF MD SHOCK TRAMA CENTER		
36	HELIPORT	UNION MEMORIAL HOSPITAL		
37	PORT	PORT OF BALTIMORE		
38	REPEATED MEASUREMENT SITE	DB - NOS, 8574680 - BALTIMORE, MD	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
39	REPEATED MEASUREMENT SITE	DB - NOS, 8574728 - FRANCIS SCOTT KEY BRIDGE, MD	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
40	REPEATED MEASUREMENT SITE	LTER BES INNER HARBOR METEOROLOGICAL ST	LONG TERM ECOL. RESEARCH NETWORK OFFICE	505-277-2597

DISPLAYED ON MAP (POINTS) (continued)

Map ID	Type	Name	Contact	Phone
41	REPEATED MEASUREMENT SITE	NWLON - BALTIMORE, FORT MCHENRY, PATAPSCO RIVER	NATIONAL WATER LEVEL PROGRAM	301-713-2815
42	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, PATAPSCO RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
43	REPEATED MEASUREMENT SITE	WQ - STATION PAT0176	CHESAPEAKE BAY PROGRAM	800-968-7229
44	REPEATED MEASUREMENT SITE	WQ - STATION WT5.1	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
45	MILITARY	COAST GUARD STATION BALTIMORE		
46	NATIONAL PARK	FORT MCHENRY		
47	PARK	PATAPSCO VALLEY SP	MARYLAND PARK SERVICE	

ALSO PRESENT IN MAPPED AREA (POINTS)

Type	Name	Contact	Phone
COAST GUARD	ACT BALTIMORE (I)		410-576-2561
COAST GUARD	ADM LAW JUDGE BALTIMORE		410-962-7434
COAST GUARD	ANT BALTIMORE		410-576-2646
COAST GUARD	CGC JAMES RANKIN (WLM 555)		
COAST GUARD	CGC SLEDGE (WLIC 75303)		410-576-2635
COAST GUARD	COAST GUARD YARD		410-789-1600
COAST GUARD	ENGINEERING LOGISTICS CENTER		410-762-6000
COAST GUARD	SECTOR BALTIMORE		
COAST GUARD	STA CURTIS BAY		410-576-2625

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
ESSENTIAL HABITAT	FEDERALLY THREATENED AND STATE ENDANGERED SPECIES		
STATE PROTECTED AREA	FORT CARROLL SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367

JURISDICTIONS

COUNTY:	ANNE ARUNDEL COUNTY, BALTIMORE CITY, BALTIMORE COUNTY, HOWARD COUNTY	***FEMA:***	REGION I
COAST GUARD:	DISTRICT 5, SECTOR BALTIMORE	***EPA:***	REGION 3
USACE:	NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT		

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	146.35	0.23
10B	Freshwater Marshes	292.32	0.46
10C	Swamps	307.39	0.48
10D	Scrub and Shrub Wetlands	42.55	0.07
9A	Sheltered Tidal Flats	7.40	0.01
7	Exposed Tidal Flats	3.38	0.01

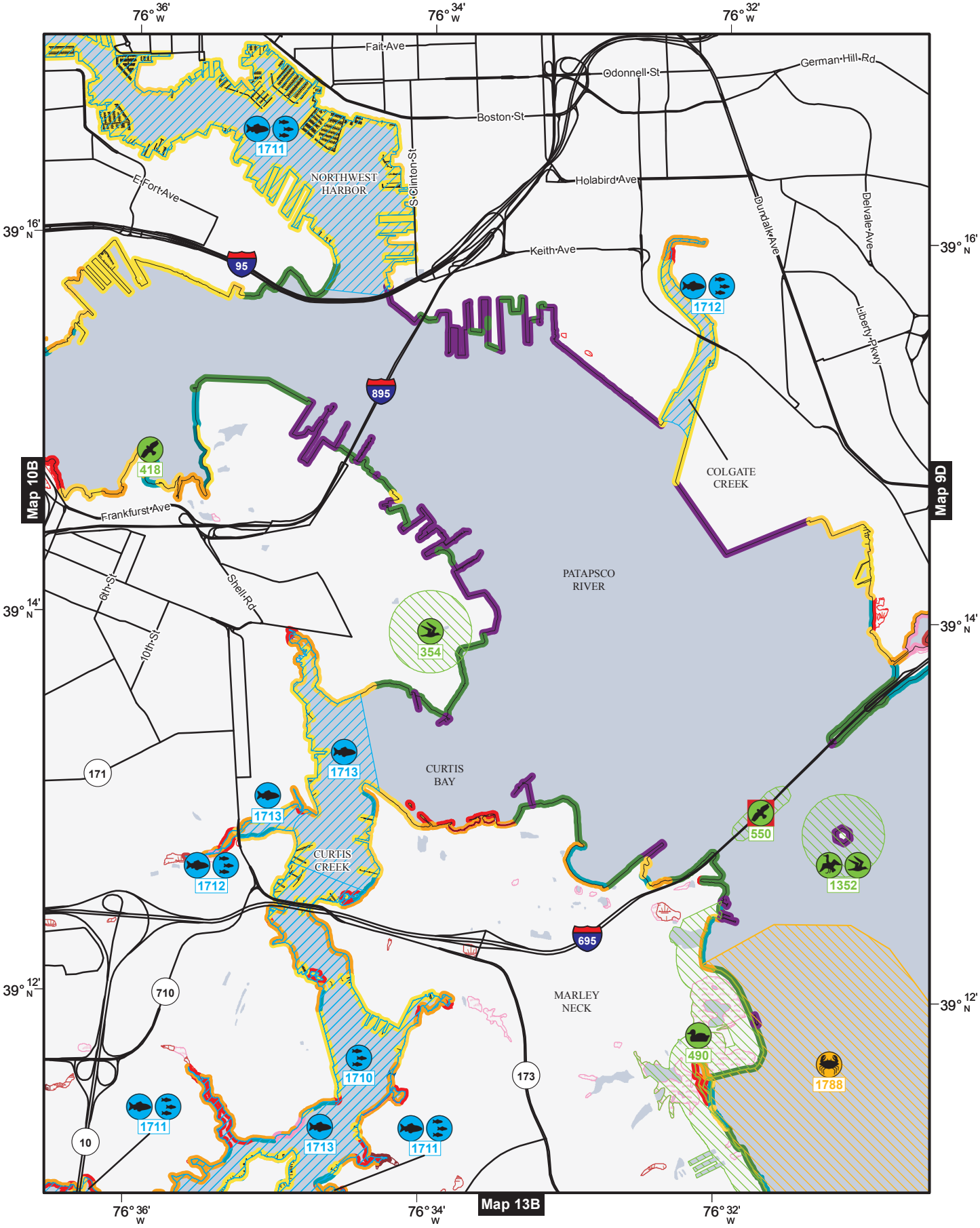
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	27,989.74	17.39	11%
10B	Freshwater Marshes	2,088.41	1.30	1%
10C	Swamps	21,754.08	13.52	9%
10D	Scrub and Shrub Wetlands	1,760.20	1.09	1%
9A	Sheltered Tidal Flats	3,794.71	2.36	2%
9B	Vegetated Low Banks	43,579.40	27.08	17%
8B	Sheltered, Solid Man-Made Structures	87,507.60	54.37	35%
8C	Sheltered Riprap	20,927.68	13.00	8%
7	Exposed Tidal Flats	1,365.78	0.85	1%
6A	Gravel Beaches	742.53	0.46	< 1%
6B	Riprap	14,199.62	8.82	6%
5	Mixed Sand and Gravel Beaches	6,908.39	4.29	3%
3B	Scarps and Steep Slopes (Sand)	89.72	0.06	< 1%
1B	Exposed, Solid Man-Made Structures	19,379.50	12.04	8%

Total ESI Shoreline:	252,087.37	Total ESI Shoreline:	156.64
Total Shoreline:	204,816.45	Total Shoreline:	127.27

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 10A

Chesapeake North

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

N

Map 10A
Chesapeake North

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	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
354	Gull/Tern	G. black-backed gull	Nesting			5 Pairs													Apr-Jun	-	-	-	-
	Gull/Tern	Herring gull	Nesting			53 Pairs													Apr-Jul	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
490	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
550	Raptor	Peregrine falcon	Nesting	-/T		-													Feb-Jun	-	Sep-Oct	-	-
1352	Diving	D. crested cormorant	Nesting			507 Pairs													May-Aug	-	-	-	-
	Gull/Tern	G. black-backed gull	Nesting			18 Pairs													Apr-Jun	-	-	-	-
	Gull/Tern	Herring gull	Nesting			166 Pairs													Apr-Jul	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1710	Estuarine Nursery	White perch	Spawning Area			Historical Spawning													Mar-May	Mar-May	Apr-Jun	-	Mar-May
1711	Estuarine Nursery	White perch	Spawning Area			Historical Spawning													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			Historical Spawning													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1712	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
	Estuarine Nursery	White perch	Spawning Area			Historical Spawning													Mar-May	Mar-May	Apr-Jun	-	Mar-May
1713	Freshwater	Yellow perch	Spawning Area			Historical Spawning													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar

INVERTEBRATES

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

BIRDS (continued)

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

FISH

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

MARINE MAMMALS

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jun	May-Jun	May-Jun	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
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	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	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

Subelement	Species	Monthly Presence (J F M A M J J A S O N D)	Spawn	Eggs	Larvae	Juveniles	Adults
Bivalve	Softshell clam		May-Dec*	-	-	Jan-Dec	Jan-Dec
Crab	Blue crab		-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

Subelement	Species	Monthly Presence (J F M A M J J A S O N D)	Mating	Calving	Pupping	Molt	
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	21.99	0.03
10B	Freshwater Marshes	134.93	0.21
10C	Swamps	25.74	0.04
10D	Scrub and Shrub Wetlands	3.26	0.01

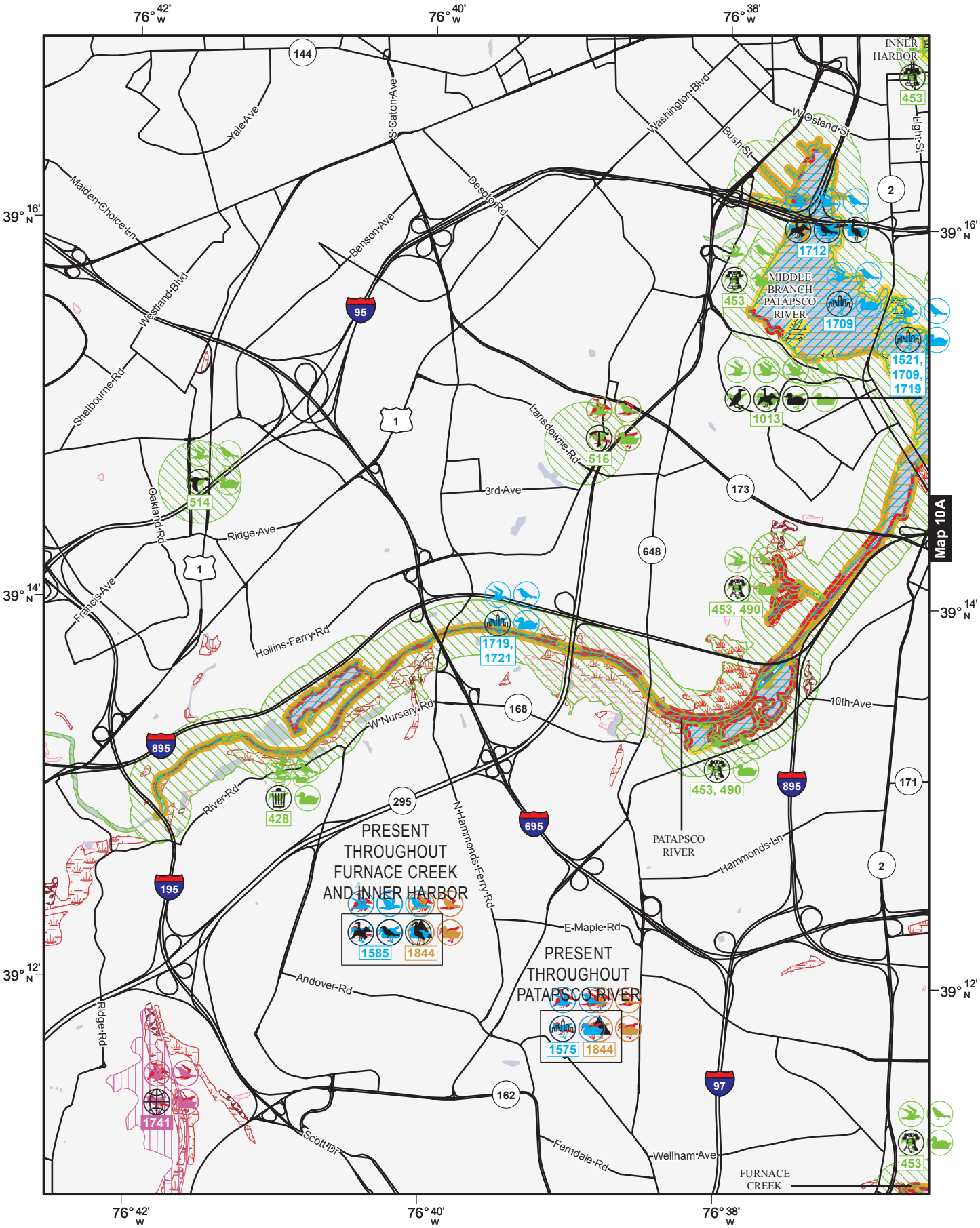
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	11,686.39	7.26	7%
10B	Freshwater Marshes	1,972.48	1.23	1%
10C	Swamps	220.60	0.14	< 1%
10D	Scrub and Shrub Wetlands	386.81	0.24	< 1%
9A	Sheltered Tidal Flats	2,974.99	1.85	2%
9B	Vegetated Low Banks	17,805.46	11.06	10%
8B	Sheltered, Solid Man-Made Structures	79,778.98	49.57	47%
8C	Sheltered Riprap	14,452.87	8.98	8%
6A	Gravel Beaches	742.53	0.46	< 1%
6B	Riprap	14,199.62	8.82	8%
5	Mixed Sand and Gravel Beaches	6,744.03	4.19	4%
3B	Scarps and Steep Slopes (Sand)	89.72	0.06	< 1%
1B	Exposed, Solid Man-Made Structures	19,379.50	12.04	11%

Total ESI Shoreline:	170,433.98	Total ESI Shoreline:	105.90
Total Shoreline:	152,482.79	Total Shoreline:	94.75

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 10B

Chesapeake North

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

N

Map 10B
Chesapeake North

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	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
428	Raptor	Bald eagle	Nesting			Last Obs. 2005													Feb-Apr	-	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
490	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
514	Wading	YC night-heron	Nesting			2 Pairs													Apr-Jul	-	-	-	-
516	Gull/Tern	Least tern	Nesting	T/-		35 Pairs													May-Aug	-	-	-	-
1013	Diving	Common loon	Wintering			10S													-	-	-	-	-
	Diving	D. crested cormorant	Migration			1,000S													-	Mar-May	Aug-Nov	-	-
	Diving	Grebes	Wintering			10S													-	-	-	-	-
	Diving	Red-throated loon	Wintering			10S													-	-	-	-	-
	Pelagic	Northern gannet	Wintering			Present													-	-	-	-	-
	Waterfowl	Bufflehead	Wintering			100S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			100S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scoters	Wintering			10S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			10S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1521	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1575	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
1585	Diadromous	Alewife	Nursery Area			Weak Run													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			Weak Run													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Weak Run													-	-	Apr-Jun	Apr-Oct	Feb-Jun

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Estuarine Nursery	White perch	Spawning Area			Historical Spawning													Mar-May	Mar-May	Apr-Jun	-	Mar-May
	Freshwater	Yellow perch	Spawning Area			Historical Spawning													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1709	Diadromous	Alewife	Nursery Area			Weak Run													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Weak Run													-	-	Apr-Jun	Apr-Oct	Feb-Jun
1712	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
	Estuarine Nursery	White perch	Spawning Area			Historical Spawning													Mar-May	Mar-May	Apr-Jun	-	Mar-May
1719	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			Weak Run													Apr-Jun	Apr-Jun	-	-	Mar-Jun
1721	Diadromous	Alewife	Nursery Area			Weak Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			Weak Run													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			Weak Run													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Weak Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			Weak Run													Apr-May	Apr-May	-	-	Feb-Jun

HABITATS & RARE PLANTS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
1741	Plant	Threatened plant	Vulnerable Occurrence	T/-		-													-	-	-	-	-

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
		American coot	Wintering			100S													-	-	-	-	-
		American wigeon	Wintering			100S													-	-	-	-	-
		Gadwall	Wintering			1,000S													-	-	-	-	-
		Green-winged teal	Wintering			10S													-	-	-	-	-
		Mallard	Wintering			1,000S													-	-	-	-	-
		Northern pintail	Wintering			100S													-	-	-	-	-
		Northern shoveler	Wintering			100S													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	White perch													-	-	-	Jan-Dec	Jan-Dec
Freshwater	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
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-Jun	-	-	-	Jan-Dec
	Smallmouth bass													Apr-Jul	-	-	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

INVERTEBRATES

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

MARINE MAMMALS

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Mating	Calving	Pupping	Molt	
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	103.82	0.16
10B	Freshwater Marshes	122.49	0.19
10C	Swamps	259.17	0.40
10D	Scrub and Shrub Wetlands	34.42	0.05
9A	Sheltered Tidal Flats	7.40	0.01
7	Exposed Tidal Flats	3.38	0.01

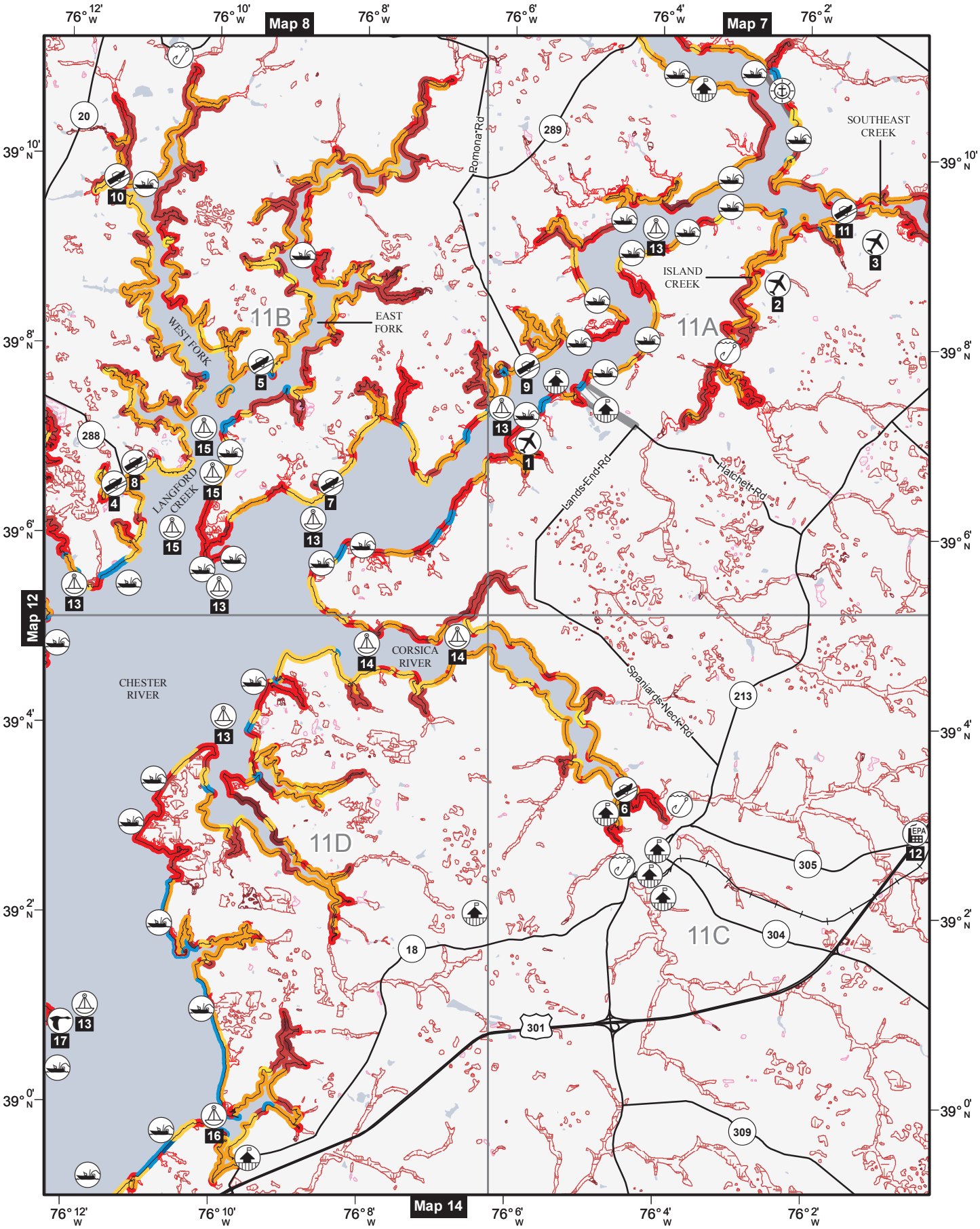
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	13,484.69	8.38	19%
10B	Freshwater Marshes	115.93	0.07	< 1%
10C	Swamps	21,533.48	13.38	30%
9A	Sheltered Tidal Flats	819.72	0.51	1%
9B	Vegetated Low Banks	24,548.75	15.25	34%
8B	Sheltered, Solid Man-Made Structures	4,363.57	2.71	6%
8C	Sheltered Riprap	6,474.82	4.02	9%
7	Exposed Tidal Flats	1,365.78	0.85	2%
5	Mixed Sand and Gravel Beaches	164.36	0.10	< 1%

Total ESI Shoreline:	72,871.10	Total ESI Shoreline:	45.28
Total Shoreline:	46,136.07	Total Shoreline:	28.67

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 11

Chesapeake North

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

N

Map 11
Chesapeake North

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)

Map ID	Type	Name	Contact	Phone
1	AIRPORT	ASHLAND LANDING FARM		
2	AIRPORT	KENNERSLEY		
3	AIRPORT	SAXON FARMS		
4	BOAT RAMP	BOAT RAMP		
5	BOAT RAMP	BROADNECK LANDING	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
6	BOAT RAMP	CENTREVILLE LANDING	QUEEN ANNE'S COUNTY - PARKS AND RECREATION	
7	BOAT RAMP	CLIFF CITY	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
8	BOAT RAMP	LONG COVE RAMP	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
9	BOAT RAMP	QUAKER NECK	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
10	BOAT RAMP	SHIPYARD LANDING	KENT COUNTY - DEPARTMENT OF PUBLIC WORKS	
11	BOAT RAMP	SOUTHEAST CREEK LANDING	QUEEN ANNE'S COUNTY - PARKS AND RECREATION	
12	EPA FACILITY	CENTREVILLE, MD 755	FACILITY MANAGER	410-758-0575
13	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, CHESTER RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
14	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, CORSICA RIVER	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
15	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, LANGFORD CREEK	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608
16	REPEATED MEASUREMENT SITE	WQ - SHELLFISH HARVEST WATERS, QUEENSTOWN CREEK	MARYLAND DEPARTMENT OF THE ENVIRONMENT	410-537-3608

DISPLAYED ON MAP (POLYGONS)

Map ID	Type	Name	Contact	Phone
17	WILDLIFE REFUGE	EASTERN NECK NATIONAL WILDLIFE REFUGE	UNITED STATES FISH AND WILDLIFE SERVICE	410-639-7056

ALSO PRESENT IN MAPPED AREA (POLYGONS)

Type	Name	Contact	Phone
ESSENTIAL HABITAT	STATE ENDANGERED SPECIES		
STATE PROTECTED AREA	BLUNTS RESERVE	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	EMORY HOLLOW RESERVE	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	EMORY'S WHARF SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	PHILADELPHIA HILL RESERVE	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	POSSUM POINT SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	RINGGOLD SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	SPANIARD POINT RESERVE	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367
STATE PROTECTED AREA	UPPER CHESTER RIVER SANCTUARY	MARYLAND DEPARTMENT OF NATURAL RESOURCES	877-620-8367

JURISDICTIONS

COUNTY: KENT COUNTY, QUEEN ANNE'S COUNTY
COAST GUARD: DISTRICT 5, SECTOR BALTIMORE
USACE: NORTH ATLANTIC DIVISION, BALTIMORE DISTRICT
FEMA: REGION I
EPA: REGION 3

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,588.15	2.48
10B	Freshwater Marshes	242.30	0.38
10C	Swamps	4,767.78	7.45
10D	Scrub and Shrub Wetlands	197.38	0.31
9A	Sheltered Tidal Flats	3.07	0.00

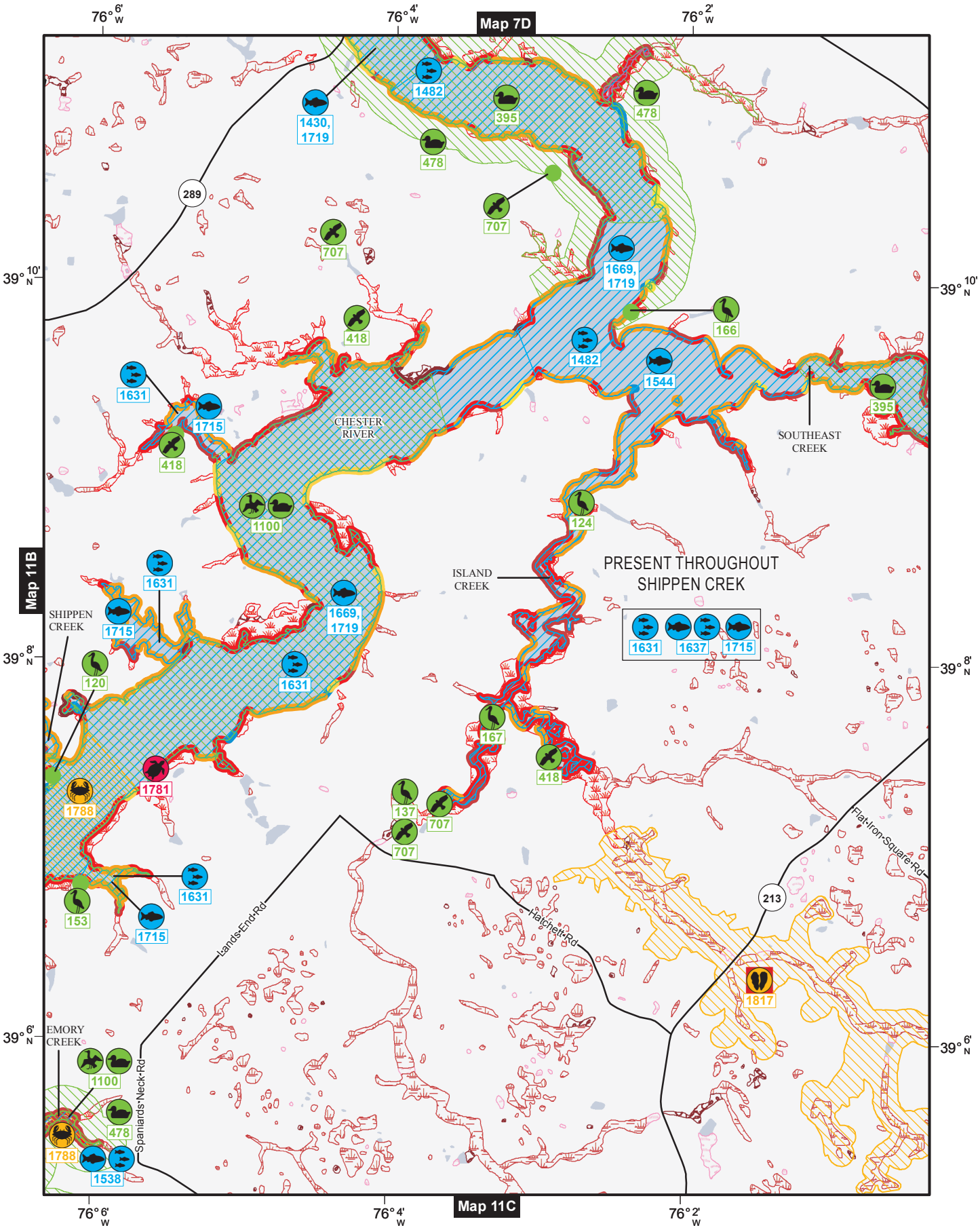
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	118,033.01	73.34	35%
10B	Freshwater Marshes	236.00	0.15	< 1%
10C	Swamps	71,580.55	44.48	21%
10D	Scrub and Shrub Wetlands	6,030.48	3.75	2%
9A	Sheltered Tidal Flats	2,280.08	1.42	1%
9B	Vegetated Low Banks	88,134.88	54.76	26%
8B	Sheltered, Solid Man-Made Structures	6,746.87	4.19	2%
8C	Sheltered Riprap	31,146.02	19.35	9%
4	Coarse Grained Sand Beaches	13,069.39	8.12	4%
3B	Scarps and Steep Slopes (Sand)	340.44	0.21	< 1%

Total ESI Shoreline:	337,597.72	Total ESI Shoreline:	209.77
Total Shoreline:	315,087.31	Total Shoreline:	195.79

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

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



Map 11A

Chesapeake North

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

N

Map 11A
Chesapeake North

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

Subelement	Species	Mapping Qualifier	Nest	Mig.(S)	Mig.(F)	Molt
SAV	Submerged aquatic veg	High Ecological Value	-	-	-	-

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt
120	Wading	Great blue heron	Nesting			5 Nests													Feb-Jun	-	-	-
124	Wading	Great blue heron	Nesting			2 Nests													Feb-Jun	-	-	-
137	Wading	Great blue heron	Nesting			21 Nests													Feb-Jun	-	-	-
153	Wading	Great blue heron	Nesting			4 Nests													Feb-Jun	-	-	-
166	Wading	Great blue heron	Nesting			11 Nests													Feb-Jun	-	-	-
167	Wading	Great blue heron	Nesting			8 Nests													Feb-Jun	-	-	-
395	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering			10,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S													-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-
	Waterfowl	Redhead	Wintering			100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10,000S													-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-
	Waterfowl	Tundra swan	Wintering			1,000S													-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-
478	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug
707	Raptor	Bald eagle	Roosting			-													-	-	-	-
1100	Diving	Common loon	Wintering			Present													-	-	-	-
	Diving	D. crested cormorant	Migration			100S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering			10S													-	-	-	-
	Diving	Red-throated loon	Wintering			Present													-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering			10,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-
	Waterfowl	Redhead	Wintering			100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
	Waterfowl	Ruddy duck	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scoters	Wintering			Present													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			1,000S													-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1430	Diadromous	Striped bass	Spawning Area			-													Apr-Jun	Apr-Jun	-	-	Mar-Jun
1482	Estuarine Nursery	White perch	Spawning Area			-													Mar-May	Mar-May	Apr-Jun	-	Mar-May
1538	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1544	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			Strong Run													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			Strong Run													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			Moderate Run													Apr-May	Apr-May	-	-	Feb-Jun
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1631	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
1637	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
1669	Diadromous	Striped bass	Migration			-													-	-	-	-	Mar-Jun
1715	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
1719	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			Weak Run													Apr-Jun	Apr-Jun	-	-	Mar-Jun

REPTILES & AMPHIBIANS

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

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct
1817	Bivalve	Dwarf wedgemussel	Vulnerable Occurrence	**E/E**	**E**	-													-	-	-	Jan-Dec	Jan-Dec
	Bivalve	Triangle floater	Vulnerable Occurrence	**E/-**		-													-	-	-	Jan-Dec	Jan-Dec

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	American coot	Wintering			Present													-	-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-	-
	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Gadwall	Wintering			1,000S													-	-	-	-	-
	Green-winged teal	Wintering			1,000S													-	-	-	-	-
	Mallard	Wintering			10,000S													-	-	-	-	-
	Northern pintail	Wintering			100S													-	-	-	-	-
	Northern shoveler	Wintering			100S													-	-	-	-	-
	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-

FISH

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

MARINE MAMMALS

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

TERRESTRIAL MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Mar-Jun
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Black crappie													Mar-Jul	-	-	Jan-Dec	-
	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Chain pickerel													Feb-Apr	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Golden shiner													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Largemouth bass													Mar-May	-	-	-	Jan-Dec
	Redfin pickerel													Feb-Mar	-	-	Jan-Dec	Jan-Dec
	Shorthead redhorse													Mar-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	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

Subelement	Species	Monthly Presence J F M A M J J A S O N D	Mating	Calving	Pupping	Molt	
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	610.18	0.95
10B	Freshwater Marshes	83.62	0.13
10C	Swamps	1,003.10	1.57
10D	Scrub and Shrub Wetlands	71.24	0.11

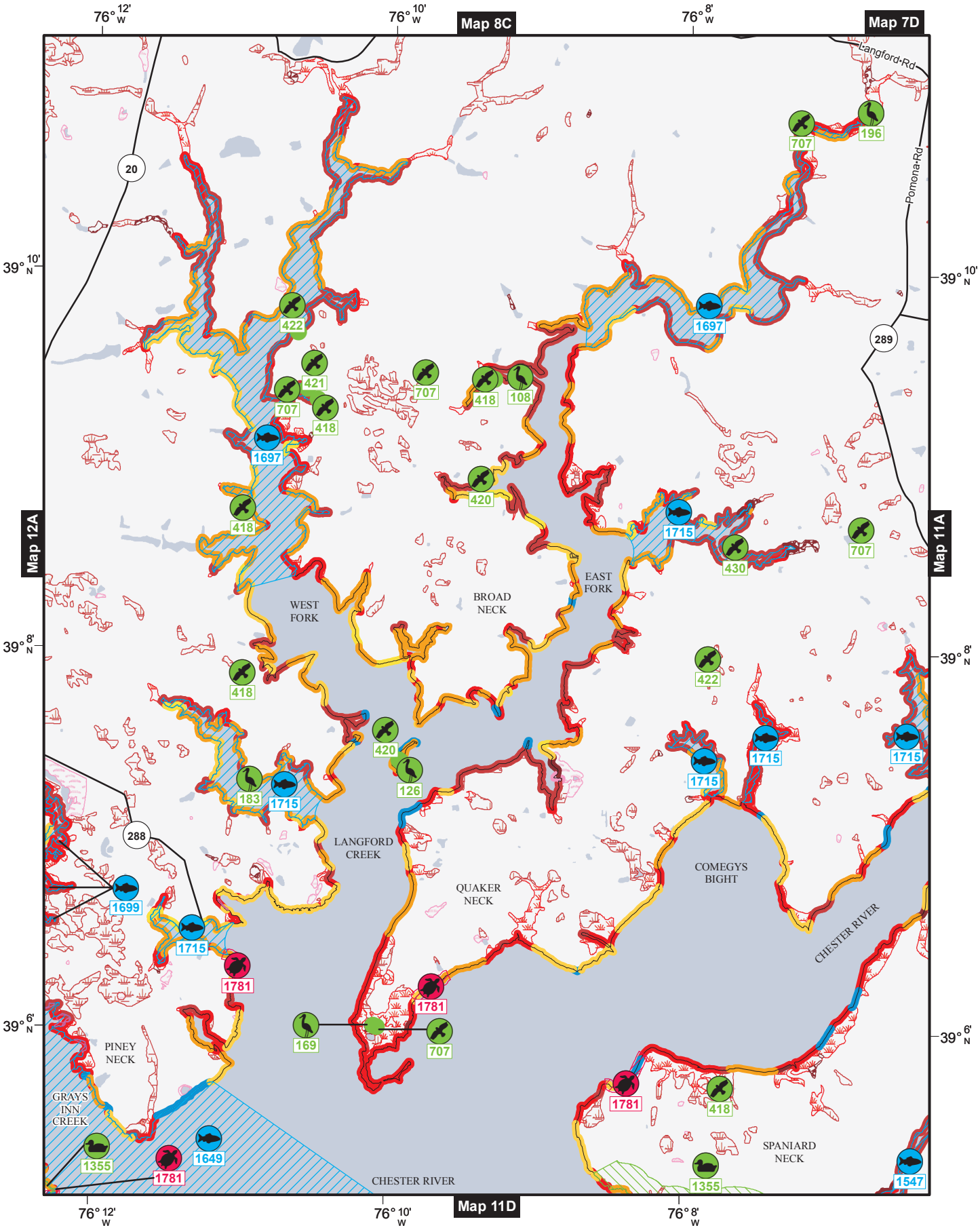
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	37,367.00	23.22	45%
10B	Freshwater Marshes	39.82	0.02	< 1%
10C	Swamps	12,872.27	8.00	15%
10D	Scrub and Shrub Wetlands	1,861.29	1.16	2%
9B	Vegetated Low Banks	26,278.90	16.33	31%
8B	Sheltered, Solid Man-Made Structures	1,151.86	0.72	1%
8C	Sheltered Riprap	2,956.81	1.84	4%
4	Coarse Grained Sand Beaches	1,301.16	0.81	2%

Total ESI Shoreline:	83,829.11	Total ESI Shoreline:	52.09
Total Shoreline:	79,982.76	Total Shoreline:	49.70

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 11B

Chesapeake North

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

N

Map 11B
Chesapeake North

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	MD/VA 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 S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
108	Wading	Great blue heron	Nesting			6 Nests													Feb-Jun	-	-	-	-
126	Wading	Great blue heron	Nesting			3 Nests													Feb-Jun	-	-	-	-
169	Wading	Great blue heron	Nesting			15 Nests													Feb-Jun	-	-	-	-
183	Wading	Great blue heron	Nesting			9 Nests													Feb-Jun	-	-	-	-
196	Wading	Great blue heron	Nesting			16 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
420	Raptor	Bald eagle	Nesting			Last Obs. 2002													Feb-Apr	-	-	-	-
421	Raptor	Bald eagle	Nesting			Last Obs. 2001													Feb-Apr	-	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-	-
430	Raptor	Bald eagle	Nesting			Last Obs. 2007													Feb-Apr	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1355	Waterfowl	American black duck	Nesting			Low-Moderate													Mar-Aug	-	-	Jul-Aug	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1547	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1649	Diadromous	Alewife	Migration			Strong Run													-	-	-	Aug-Nov	Mar-May
	Diadromous	American shad	Migration			Weak Run													-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Blueback herring	Migration			Strong Run													-	-	-	Aug-Nov	Feb-Jun
	Diadromous	Hickory shad	Migration			Moderate Run													-	-	-	Jun-Oct	Feb-Jun
1697	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			Strong Run													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			Strong Run													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			Moderate Run													Apr-May	Apr-May	-	-	Feb-Jun
1699	Diadromous	Alewife	Migration			Strong Run													-	-	-	Aug-Nov	Mar-May
	Diadromous	Blueback herring	Migration			Strong Run													-	-	-	Aug-Nov	Feb-Jun
1715	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun

REPTILES & AMPHIBIANS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

FISH

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

INVERTEBRATES

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

MARINE MAMMALS

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

TERRESTRIAL MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

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

FISH (continued)

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
Marine Benthic	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Mating	Calving	Pupping	Molt	
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	521.36	0.81
10B	Freshwater Marshes	68.86	0.11
10C	Swamps	722.46	1.13
10D	Scrub and Shrub Wetlands	33.52	0.05

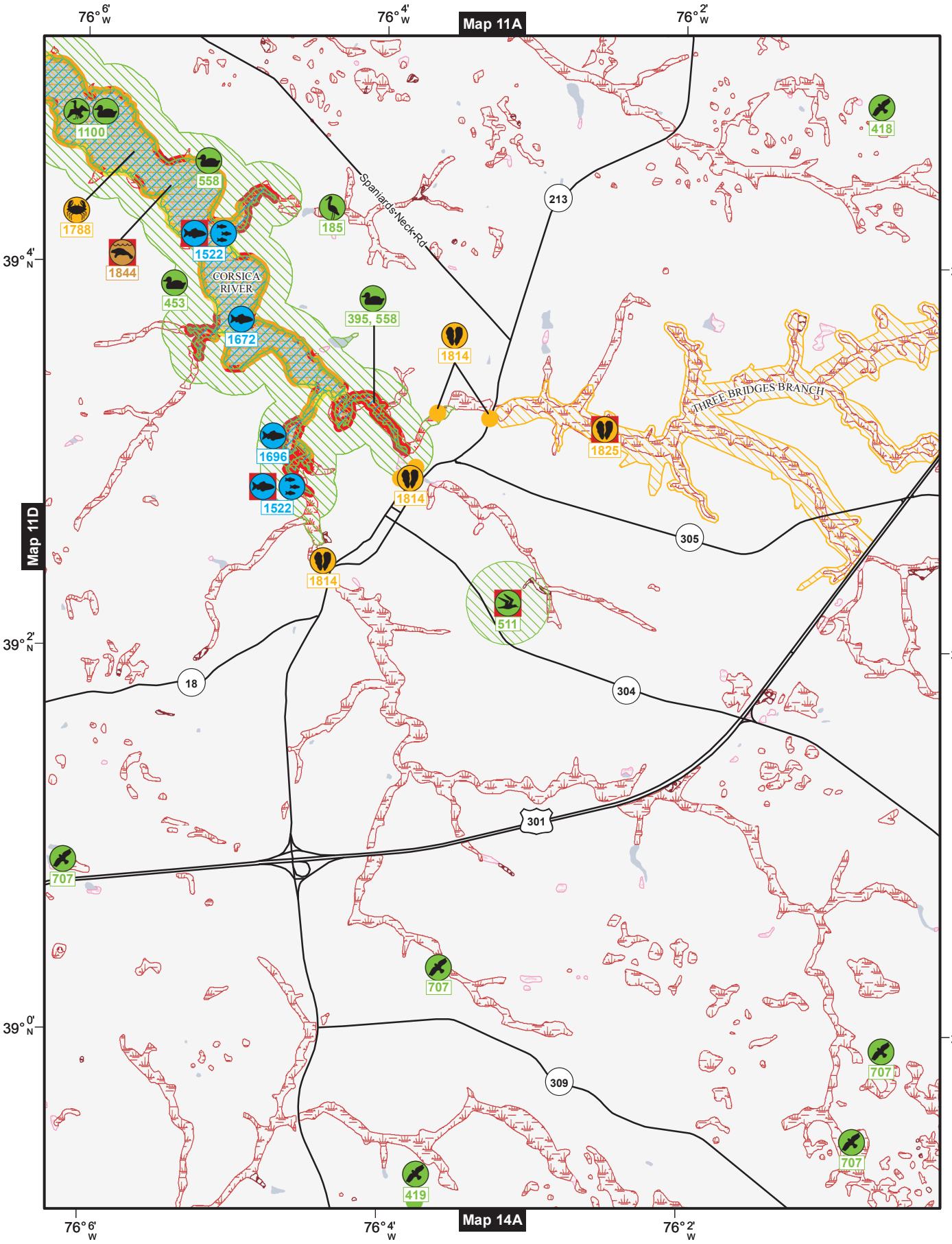
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	41,860.73	26.01	29%
10B	Freshwater Marshes	196.18	0.12	< 1%
10C	Swamps	43,828.55	27.23	31%
10D	Scrub and Shrub Wetlands	1,415.50	0.88	1%
9B	Vegetated Low Banks	32,567.39	20.24	23%
8B	Sheltered, Solid Man-Made Structures	3,050.69	1.90	2%
8C	Sheltered Riprap	16,932.06	10.52	12%
4	Coarse Grained Sand Beaches	3,156.39	1.96	2%

Total ESI Shoreline:	143,007.50	Total ESI Shoreline:	88.86
Total Shoreline:	138,339.74	Total Shoreline:	85.96

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 11C

Chesapeake North

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

N

Map 11C
Chesapeake North

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	MD/VA F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
185	Wading	Great blue heron	Nesting			56 Nests													Feb-Jun	-	-	-	-
395	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Redhead	Wintering			100S													-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			100S													-	-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Scaup	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Tundra swan	Wintering			1,000S													-	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
419	Raptor	Bald eagle	Nesting			Last Obs. 1999													Feb-Apr	-	-	-	-
453	Waterfowl	Canada goose	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
	Waterfowl	Mallard	Nesting			Moderate-High													Mar-Aug	-	-	Jul-Aug	-
	Waterfowl	Wood duck	Nesting			Moderate-High													Mar-Jun	-	-	Jul-Aug	-
511	Gull/Tern	Least tern	Nesting	T/-		92 Pairs													May-Aug	-	-	-	-
558	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-	-
	Waterfowl	American coot	Wintering			Present													-	-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Mallard	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Northern pintail	Wintering			100S													-	-	-	-	-
	Waterfowl	Northern shoveler	Wintering			100S													-	-	-	-	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1100	Diving	Common loon	Wintering			Present													-	-	-	-	-
	Diving	D. crested cormorant	Migration			100S													-	Mar-May	Aug-Nov	-	-
	Diving	Grebes	Wintering			10S													-	-	-	-	-
	Diving	Red-throated loon	Wintering			Present													-	-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-	-
	Waterfowl	Canada goose	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Canvasback	Wintering			10,000S													-	-	-	-	-
	Waterfowl	Common goldeneye	Wintering			100S													-	-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-	-	-
	Waterfowl	Mergansers	Wintering			1,000S													-	-	-	-	-

BIRDS (continued)

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

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1522	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Estuarine Nursery	White perch	Nursery Area			-													-	-	Apr-Jun	Jan-Dec	-
	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1672	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			Weak Run													Apr-Jun	Apr-Jun	-	-	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	Feb-Jun
	Diadromous	Striped bass	Migration			-													-	-	-	-	Mar-Jun
1696	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Alewife	Spawning Area			Strong Run													Mar-May	Mar-May	-	-	Mar-May
	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	-
	Diadromous	Blueback herring	Spawning Area			Strong Run													Apr-Jun	Apr-Jun	-	-	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	-
	Diadromous	Hickory shad	Spawning Area			Moderate Run													Apr-May	Apr-May	-	-	Feb-Jun

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct
1814	Bivalve	Eastern elliptio	Vulnerable Occurrence			-													-	-	-	Jan-Dec	Jan-Dec
1825	Bivalve	Dwarf wedgemussel	Vulnerable Occurrence	E/E	E	-													-	-	-	Jan-Dec	Jan-Dec

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

TERRESTRIAL MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													Apr-May	Apr-May	Apr-Jun	Apr-Oct	Feb-Jun
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
Marine Benthic	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

Subelement	Species	Monthly Presence J F M A M J J A S O N D	Mating	Calving	Pupping	Molt	
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	95.22	0.15
10B	Freshwater Marshes	49.39	0.08
10C	Swamps	1,917.52	3.00
10D	Scrub and Shrub Wetlands	33.21	0.05

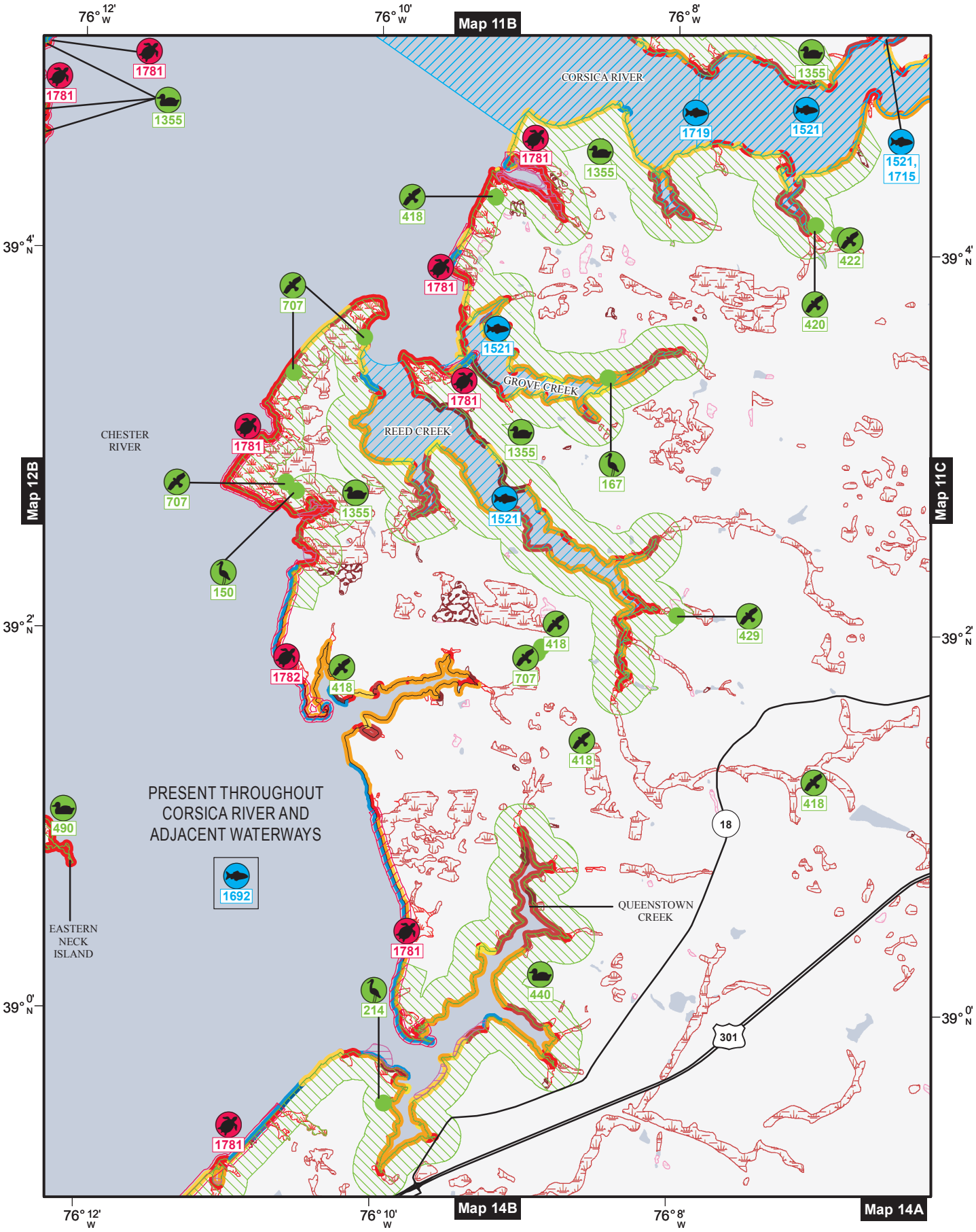
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	8,476.22	5.27	41%
10C	Swamps	2,371.28	1.47	12%
10D	Scrub and Shrub Wetlands	57.52	0.04	< 1%
9B	Vegetated Low Banks	6,849.43	4.26	33%
8B	Sheltered, Solid Man-Made Structures	747.21	0.46	4%
8C	Sheltered Riprap	2,039.52	1.27	10%
4	Coarse Grained Sand Beaches	21.58	0.01	< 1%

Total ESI Shoreline:	20,562.76	Total ESI Shoreline:	12.78
Total Shoreline:	20,376.59	Total Shoreline:	12.66

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

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



Map 11D

Chesapeake North

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

N

Map 11D
Chesapeake North

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	MD/VA 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 S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt	
150	Wading	Great blue heron	Nesting			10 Nests													Feb-Jun	-	-	-	-
167	Wading	Great blue heron	Nesting			8 Nests													Feb-Jun	-	-	-	-
214	Wading	Great blue heron	Nesting			45 Nests													Feb-Jun	-	-	-	-
418	Raptor	Bald eagle	Nesting			Last Obs. 2004													Feb-Apr	-	-	-	-
420	Raptor	Bald eagle	Nesting			Last Obs. 2002													Feb-Apr	-	-	-	-
422	Raptor	Bald eagle	Nesting			Last Obs. 2003													Feb-Apr	-	-	-	-
429	Raptor	Bald eagle	Nesting			Last Obs. 2006													Feb-Apr	-	-	-	-
440	Waterfowl	American black duck	Nesting			Moderate													Mar-Aug	-	-	Jul-Aug	-
490	Waterfowl	American black duck	Nesting			Low													Mar-Aug	-	-	Jul-Aug	-
707	Raptor	Bald eagle	Roosting			-													-	-	-	-	-
1355	Waterfowl	American black duck	Nesting			Low-Moderate													Mar-Aug	-	-	Jul-Aug	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1521	Freshwater	Yellow perch	Spawning Area			-													Feb-Mar	Feb-Mar	Mar-Apr	-	Feb-Mar
1692	Diadromous	Alewife	Nursery Area			Strong Run													-	-	Apr-Jun	Apr-Oct	Mar-May
	Diadromous	Blueback herring	Nursery Area			Strong Run													-	-	May-Jul	May-Oct	Feb-Jun
	Diadromous	Hickory shad	Nursery Area			Moderate Run													-	-	Apr-Jun	Apr-Oct	Feb-Jun
1715	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	Mar-Jun
1719	Diadromous	American shad	Nursery Area			Weak Run													-	-	May-Jul	May-Oct	-
	Diadromous	American shad	Spawning Area			Weak Run													Apr-Jun	Apr-Jun	-	-	Mar-Jun

REPTILES & AMPHIBIANS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

FISH

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

INVERTEBRATES

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

MARINE MAMMALS

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

TERRESTRIAL MAMMALS

Subelement	Species	Mapping Qualifier	MD/VA S	MD/VA F	Concentration	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D					
Small Mammal	Delmarva fox squirrel	General Distribution	E/E		-													-	-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Subelement	Species	Monthly Presence J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
Diadromous	Alewife													Mar-May	Mar-May	Apr-Jun	Apr-Oct	Mar-May
	American eel													-	-	-	Jan-May	Jan-Dec
	Blueback herring													Apr-Jun	Apr-Jun	May-Jul	May-Oct	Feb-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
Estuarine Nursery	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Spot													-	-	-	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
Estuarine Resident	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
Fish	Anchovies													Apr-Sep	-	-	-	Jan-Dec
Freshwater	Blue catfish													May-Jun	May-Jun	May-Jun	Jan-Dec	Jan-Dec
	Bullhead catfish													Apr-Jun	-	-	-	Jan-Dec
	Channel catfish													May-Jun	-	-	Jan-Dec	Jan-Dec
	Yellow perch													-	-	-	Jan-Dec	Jan-Dec
Marine Benthic	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
Marine Pelagic	Butterfish													-	-	-	Jul-Sep	Mar-Nov
	Harvestfish													-	-	-	-	May-Nov

INVERTEBRATES

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

MARINE MAMMALS

Subelement	Species	Monthly Presence J F M A M J J A S O N D	Mating	Calving	Pupping	Molt	
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	361.39	0.56
10B	Freshwater Marshes	40.44	0.06
10C	Swamps	1,124.71	1.76
10D	Scrub and Shrub Wetlands	59.40	0.09
9A	Sheltered Tidal Flats	3.07	0.00

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	30,329.06	18.85	34%
10C	Swamps	12,508.45	7.77	14%
10D	Scrub and Shrub Wetlands	2,696.17	1.68	3%
9A	Sheltered Tidal Flats	2,280.08	1.42	3%
9B	Vegetated Low Banks	22,439.16	13.94	25%
8B	Sheltered, Solid Man-Made Structures	1,797.10	1.12	2%
8C	Sheltered Riprap	9,217.63	5.73	10%
4	Coarse Grained Sand Beaches	8,590.26	5.34	10%
3B	Scarps and Steep Slopes (Sand)	340.44	0.21	< 1%

Total ESI Shoreline:	90,198.35	Total ESI Shoreline:	56.05
Total Shoreline:	76,388.23	Total Shoreline:	47.47

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

Human-Use Features

- Aquaculture
- Airport
- Anchorage
- Artificial Reef
- Abandoned Vessel
- Beach
- Boat Ramp
- Commercial Fishing
- Critical Habitat
- EPA Facility
- Ferry
- Heliport
- Historical Site
- Lock and Dam
- Marina
- Military
- Mooring Site
- Management Area
- National Estuarine Research Reserve
- National Park
- Nature Conservancy
- Park
- Port
- Recreational Fishing
- Repeated Measurement Site
- State Protected
- Tribal Land
- Water Intake
- Wildlife Refuge
- US Highway
- State Highway or Route
- Interstate
- Road
- Shipping Lane
- Rail Route
- Pipeline
- Ferry Route
- Management Area
- Map ID

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
  - Birds
  - Alcid/Pelagic
  - Diving
  - Gull/Tern/Bird
  - Passerine
  - Raptor
  - Shorebird
  - Wading
  - Waterfowl
- Fish
  - Fish
  - Nursery
  - Fish
- Invertebrates
  - Invertebrates
  - Crab/Invertebrate/Shellfish
  - Bivalve/Barnacle/Chordate
  - Cephalopod
  - Insect
  - Gastropod
  - Lobster
  - Shrimp
- Marine Mammals
  - Dolphin
  - Pinniped
  - Whale
  - Manatee
- Terrestrial Mammals
  - Small Mammal
  - Ungulate
  - Bat
- Habitats
  - Upland/Wetland/Plant
- Reptiles &
  - Amphibian
  - Turtle
- Threatened or Endangered Species
- 1 2 3 4 5 6 Map ID

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 spcies 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.