

Environmental Sensitivity Index Maps

A Guide to Coastal Resources at Risk to Spilled Oil

Chesapeake Bay: Volume 7 Lower Peninsula



Office of Response and Restoration

September 2016

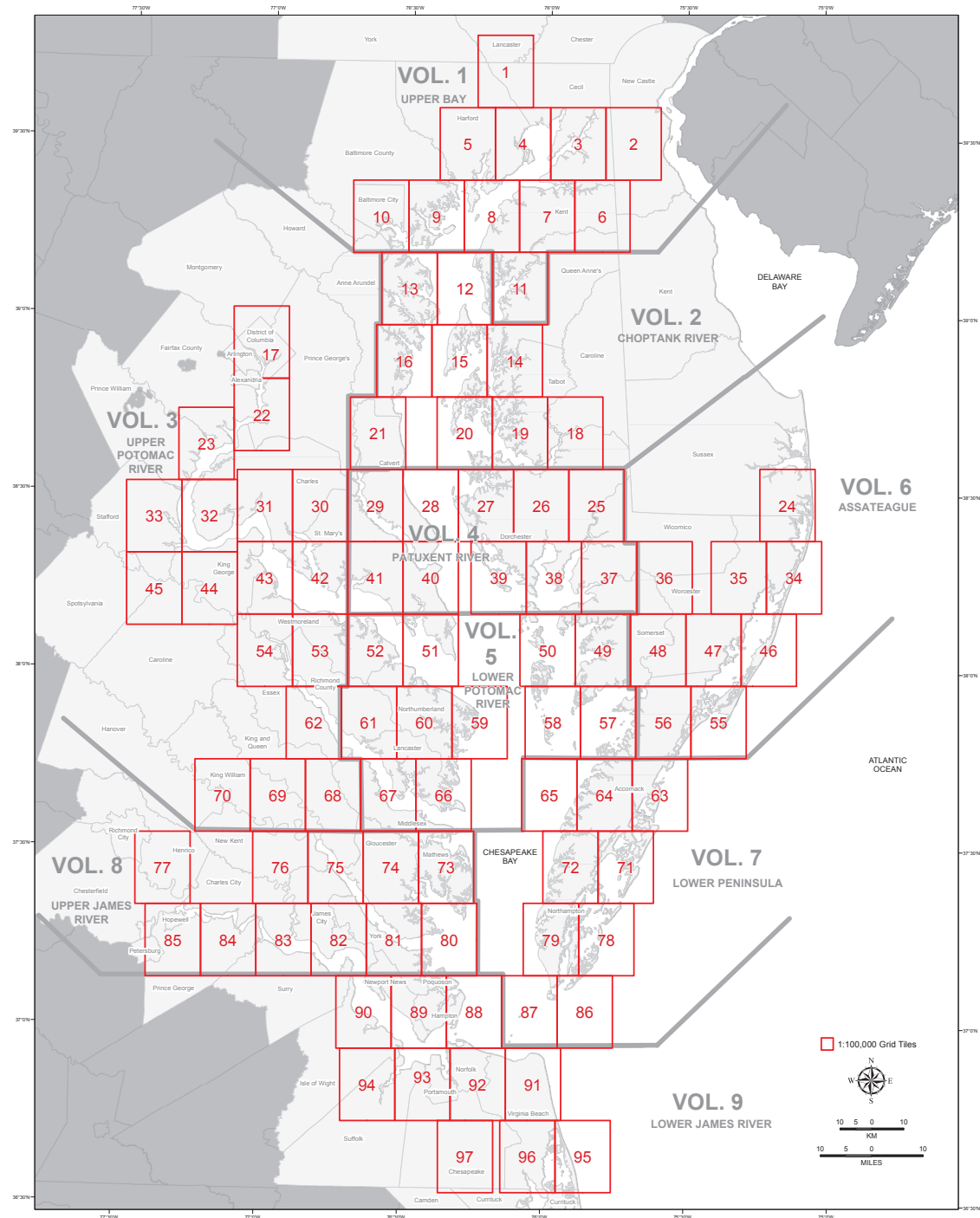
NOAA

Environmental Sensitivity

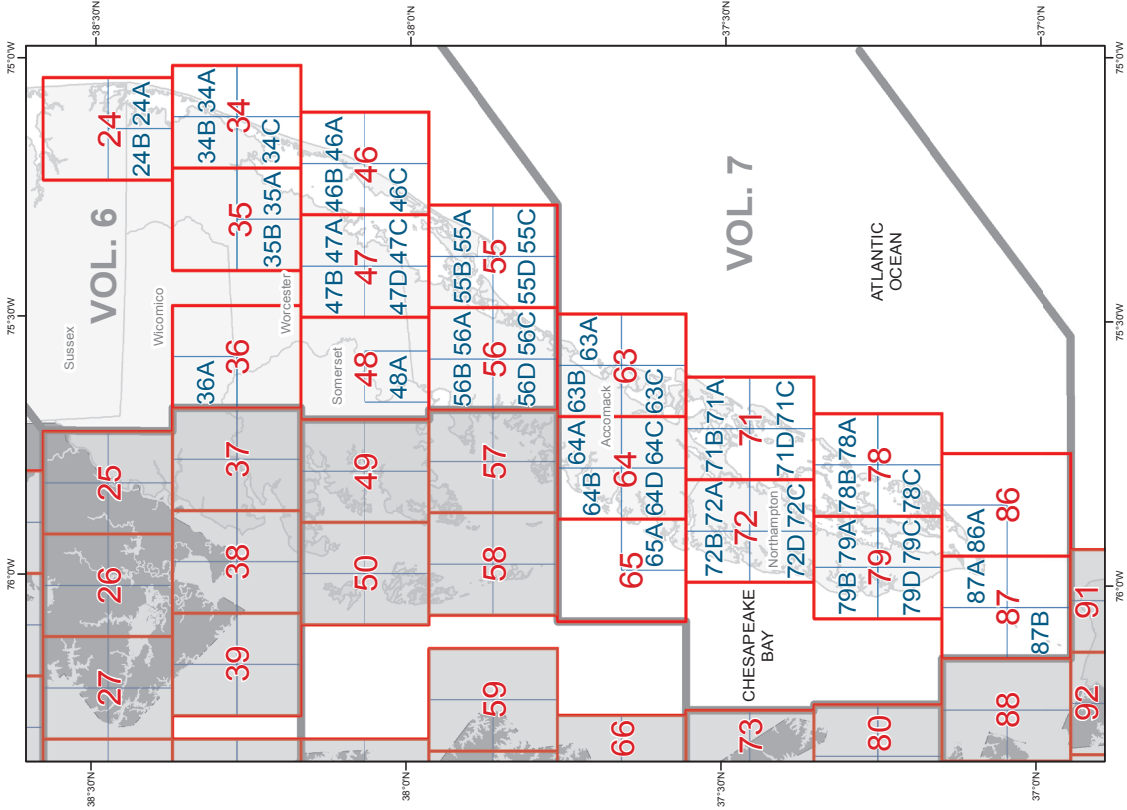
Index Maps

A Guide to Coastal Resources at Risk to Spilled Oil

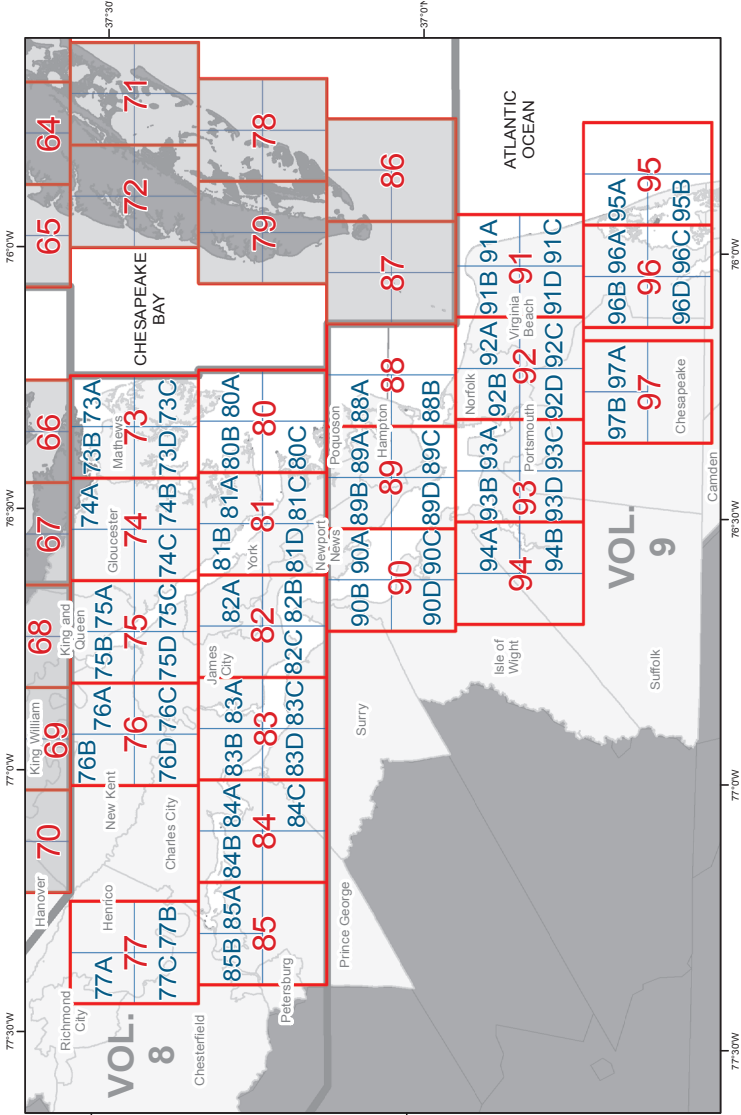
Chesapeake Bay and the Outer Coasts of Maryland and Virginia



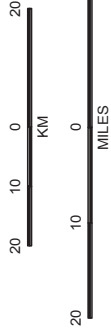
Chesapeake Bay: Volumes 6 and 7
(Delmarva Peninsula: Assateague and Lower Peninsula)



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



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



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ENVIRONMENTAL SENSITIVITY INDEX: CHESAPEAKE BAY AND THE OUTER COASTS OF MARYLAND AND VIRGINIA

INTRODUCTION

This Environmental Sensitivity Index (ESI) atlas was developed for the land 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, Pompcreek, Deep Creek, Onancock Creek, Pungoteague Creek, Nandua Creek, Curratuck Creek, Craddock Creek, Occohannock Creek, Nassawaddox Creek, Hungars Creek, Cherrystone Inlet, and Longs Pond.]. The ESI represents a compilation of information about three main categories: shoreline habitats, sensitive biological resources, and human-use resources. Though the data will be useful for many shoreline applications, the goal of the ESI data is to present a concise summary of resources that may be particularly vulnerable to spilled oil. The intent of the data should caveat other uses. As an example, the ESI is not intended to present a catalog or comprehensive listing of species present in an area, rather the focus is on species particularly sensitive to oiling and life stages where vulnerability may increase.

SHORELINE HABITAT MAPPING

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

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

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

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

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

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

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

SENSITIVE BIOLOGICAL RESOURCES

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

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

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

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

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

KEY BIOLOGICAL FEATURES ON ESI MAPS

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

MARINE MAMMAL



Dolphin



Manatee



Pinniped



Whale

TERRESTRIAL MAMMAL



Bat



Small Mammal



Ungulate

HERPETOFAUNA



Amphibian



Turtle

INVERTEBRATE



Bivalve



Cephalopod



Crab



Gastropod



Insect



Lobster



Shrimp

FISH



Fish



Nursery

BIRD



Alcid/Pelagic



Diving



Gull/Tern



Passerine



Raptor



Shorebird



Wading



Waterfowl

HABITAT



Upland/Wetland/Plant

Mapping Qualifiers and Guidelines

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

MARINE MAMMALS

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

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

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

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

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

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

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

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

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

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

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

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

Major Data Sources Used: Marine Mammals

- Barco, S.G., W.A. McLellan, J.M. Allen, R.A. Asmus-Silia, R. Mallon-Day, E.M. Meagher, D.A. Pabst, J. Robbins, R.E. Seton, W.M. Swingle, M.T. Weinrich, and P.J. Clapham. 2002. Population identity of humpback whales (*Megaptera novaeangliae*) in the waters of the US mid-Atlantic states. *Journal of Cetacean Research Management* 4(2): 135-141.
- Biodiversity Research Institute. 2015. Wildlife Densities and Habitat Use Across Temporal and Spatial Scales on the Mid-Atlantic Continental Shelf. Online vector digital data accessed on January 26, 2016 at: <http://www.briloon.org/mabs/data>.
- Biodiversity Research Institute. 2015. Baseline Wildlife Studies in Atlantic Waters Offshore of Maryland. Online vector digital data accessed on January 26, 2016 at: <http://www.briloon.org/mabs/data>.
- Cummings, E. W., D.A. Pabst, J.E. Blum, S.G. Barco, S.J. Davis, V.G. Thayer, N. Adimey, and W.A. McLellan. 2014. Spatial and Temporal Patterns of Habitat Use and Mortality of the Florida Manatee (*Trichechus manatus latirostris*) in the Mid-Atlantic States of North Carolina and Virginia from 1991 to 2012. *Aquatic Mammals* 40(2): 126-138.
- Engelhaupt, A., J. Aschettino, T.A. Jefferson, M. Richlen, and D. Engelhaupt. 2015. Occurrence, Distribution, and Density of Marine Mammals Near Naval Station Norfolk & Virginia Beach, VA: Annual Progress Report. Final Report. Prepared for U.S. Fleet Forces Command. Submitted to Naval Facilities Engineering Command Atlantic, Norfolk, Virginia, under Contract No. N62470-10-3011, Task Orders 031 and 043, issued to HDR Inc., Virginia Beach, Virginia. 7 August 2015.
- Engelhaupt, A., M. Richlen, T.A. Jefferson, and D. Engelhaupt. 2014. Occurrence, Distribution, and Density of Marine Mammals Near Naval Station Norfolk & Virginia Beach, VA: Annual Progress Report. Prepared for U.S. Fleet Forces Command. Submitted to Naval Facilities Engineering Command (NAVFAC) Atlantic, Norfolk, Virginia, under Contract No. N62470-10-3011, Task Orders 031 and 043, issued to HDR Inc., Norfolk, Virginia. 22 July 2014.

- Global Biodiversity Information Facility (GBIF). 2015. Observation data for Cetacea, Phocidae and Sirenia in Maryland and Virginia from 1986-2015. Spreadsheet (.csv). Online data accessed on January 27, 2016 from: <http://www.gbif.org/>.
- Halpin, P.N., A.J. Read, E. Fujioka, B.D. Best, B. Donnelly, L.J. Hazen, C. Kot, K. Urian, E. LaBrecque, A. Dimatteo, J. Cleary, C. Good, L.B. Crowder, and K.D. Hyrenbach. 2009. OBIS-SEAMAP: The world data center for marine mammal, sea bird, and sea turtle distributions. *Oceanography*. 22(2): 104-115. Spreadsheet (.csv). Online data accessed on December 17, 2015 from <http://seamap.env.duke.edu/>.
- Roberts, J. J., B.D. Best, L. Mannocci, E. Fujioka, P.N. Halpin, D.L. Palka, L.P. Garrison, K.D. Mullin, T.V.N. Cole, C.B. Khan, W.A. McLellan, D.A. Pabst, and G.G. Lockhart. 2016. Habitat-based cetacean density models for the US Atlantic and Gulf of Mexico. *Scientific reports*, 6 (#22615). <http://seamap.env.duke.edu/models/Duke-EC-GOM-2015/>.
- Waring G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel, editors. 2015. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2014. NOAA Tech Memo NMFS NE 231, 361 p. doi: 10.7289/V5TQ5ZH0. Accessed at <http://www.nmfs.noaa.gov/pr/sars/region.htm>.

BIRDS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Major Data Sources Used: Birds

Biodiversity Research Institute. 2014. Mid-Atlantic Baseline Studies: Boat surveys 2002-2014, vector digital data.

Bradshaw, D. 2008. George Washington Birthplace National Monument Avian Inventory. Technical Report NPS/NER/NRTR-2008.112 National Park Service. Philadelphia, PA, 66 pp.

Breeding Bird Atlas Explorer (online resource). 2016. U.S. Geological Survey Patuxent Wildlife Research Center. Data compiled from: Maryland and the District of Columbia Breeding Bird Atlas 2002-2006. Maryland Ornithological Society. Available at: <http://www.pwrc.usgs.gov/bba> (Accessed: November 2015).

Department of Energy. 2014. Seabird Surveys 2007-2014, vector digital data.

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).

Iliff, M.J., R.F. Ringler, and J.L. Stasz. 1996. Field List of the Birds of Maryland, Third Edition. Maryland Ornithological Society, Baltimore, MD, 53 pp.

MD DNR. 2015. Coastal Bay Waterfowl Surveys 2013-2015, vector digital data.

MD DNR. 2015. Colonial Waterbird Quarter mile Buffer, Chesapeake Bay AOI, vector digital data.

MD DNR. 2015. Waterfowl Areas, vector digital data.

NOAA. Atlantic Marine Assessment Program and Protected Species surveys 2011-2014, vector digital data.

Reese, J.G. and Weterings, R. 2013. Transient Waterfowl in Chesapeake Bay. Unpublished.

Rottenborn, S.C. and E.S. Brinkley, editors. 2007. Virginia's Birdlife: An Annotated Checklist, Fourth Edition. Virginia Society of Ornithology, Ervington, VA. 330 pp.

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.

- TNC, VDGIF, USFWS. 2016. American oystercatcher (AMOY) winter roost sites, vector digital data.
- 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.

U.S. Geological Survey. 2002. Terrapin survey 2002, vector digital data.

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 (ChesMMAAP), MD DNR Coastal Bays Fisheries Investigation, and VIMS Juvenile Fish and Blue Crab Trawl Survey. These data sets were supplemented with information from Funderburk et al. (1991), Murdy and Musick (2013), and then systematically reviewed by resource managers and scientists from MD DNR, VDGIF, USFWS and VIMS.

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

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

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

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

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

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

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

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

Expert contacts for Virginia fish*:

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

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

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

Expert contacts for Maryland fish*:

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

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

Major Data Sources Used: Fish

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

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

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

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

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

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

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

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

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

INVERTEBRATES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Major Data Sources Used: Invertebrates

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

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

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

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

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

BENTHIC HABITATS

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

SAV species assemblages and months present:

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

*Dominant species

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

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

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

Major Data Sources Used: Benthic Habitats

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

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

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

HABITATS

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

State threatened plant genera mapped in Maryland:

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

State endangered plant genera mapped in Maryland:

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

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

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

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

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

Major Data Sources Used: Habitats

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

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

INVASIVE SPECIES

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

TERRESTRIAL MAMMALS

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

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

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

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

Major Data Sources Used: Terrestrial Mammals

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

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

WILDLIFE REHABILITATION

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






























HUMAN-USE RESOURCES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Marina: Marina location data were provided by MD DNR.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GEOGRAPHIC INFORMATION SYSTEM

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

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

MAJOR ROADS

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

SHORELINE CLASSIFICATIONS

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

SENSITIVE BIOLOGICAL RESOURCES

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

HUMAN-USE RESOURCES

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

ACKNOWLEDGMENTS

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

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

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

APPROPRIATE USE OF ATLAS AND DATA

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

SPECIES LIST

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

SPECIES LIST

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

SPECIES LIST

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

SPECIES LIST

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

SPECIES LIST

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

SHORELINE DESCRIPTIONS

EXPOSED, ROCKY SHORES

ESI = 1A

DESCRIPTION

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

PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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



SHORELINE DESCRIPTIONS

EXPOSED, SOLID MAN-MADE STRUCTURES

ESI = 1B

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

EXPOSED SCARPS AND STEEP SLOPES (CLAY)

ESI = 2B

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

FINE- TO MEDIUM-GRAINED SAND BEACHES

ESI = 3A

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

SCARPS AND STEEP SLOPES (SAND)

ESI = 3B

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

COARSE-GRAINED SAND BEACHES

ESI = 4

DESCRIPTION

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

PREDICTED OIL BEHAVIOR

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



RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

MIXED SAND AND GRAVEL BEACHES

ESI = 5

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

GRAVEL BEACHES

ESI = 6A

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

RIPRAP

ESI = 6B

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

BOULDER RUBBLE

ESI = 6D

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

EXPOSED TIDAL FLATS

ESI = 7

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

SHELTERED SCARPS (BEDROCK/MUD/CLAY)

ESI = 8A

DESCRIPTION

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

PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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



SHORELINE DESCRIPTIONS

SHELTERED, SOLID MAN-MADE STRUCTURES

ESI = 8B

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

SHELTERED RIPRAP

ESI = 8C

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

SHELTERED, ROCKY, RUBBLE SHORES

ESI = 8D

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

SHELTERED TIDAL FLATS

ESI = 9A

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

VEGETATED LOW BANKS

ESI = 9B

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

SALT- AND BRACKISH-WATER MARSHES

ESI = 10A

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

FRESHWATER MARSHES

ESI = 10B

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

SHORELINE DESCRIPTIONS

SWAMPS

ESI = 10C

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

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

RESPONSE CONSIDERATIONS

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

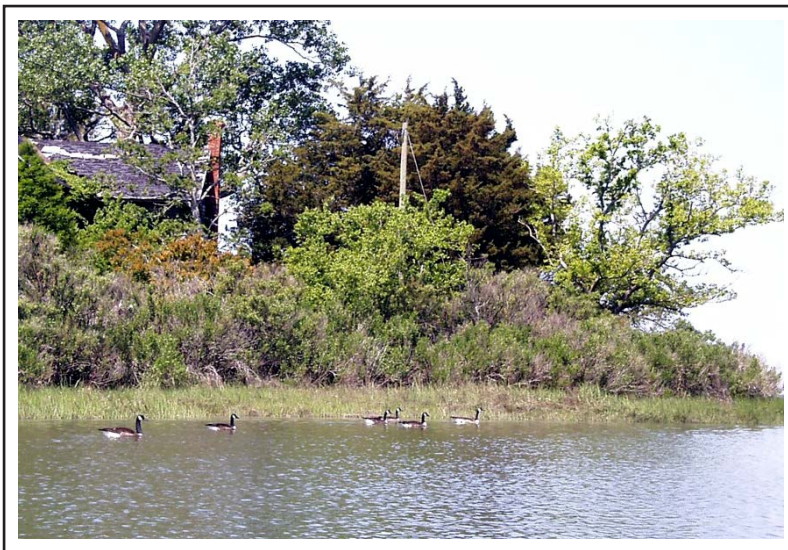
SHORELINE DESCRIPTIONS

SCRUB AND SHRUB WETLANDS

ESI = 10D

DESCRIPTION

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



PREDICTED OIL BEHAVIOR

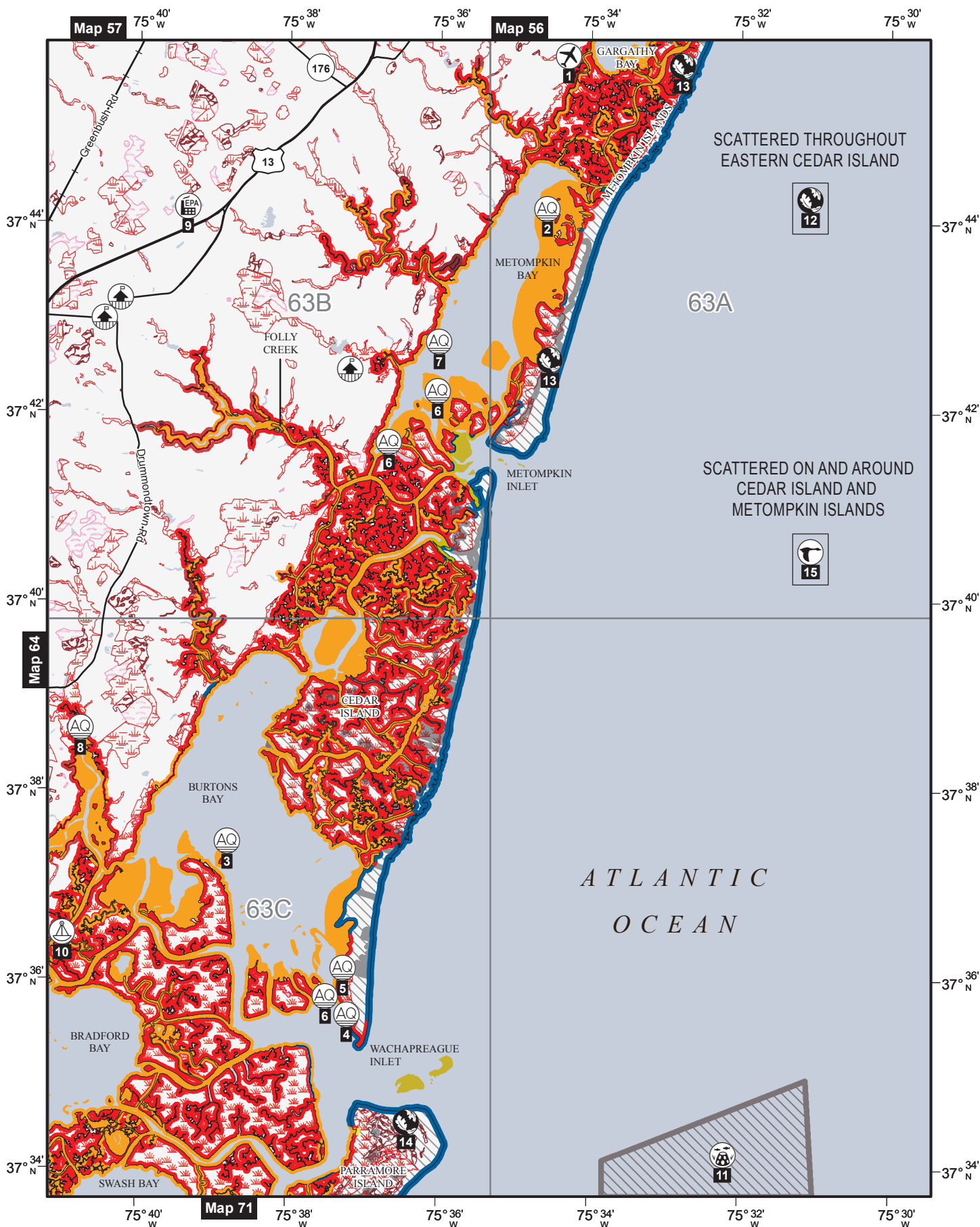
- Oil behavior depends on water level
- During high water, most of the oil passes through the forest, coating the vegetation above the waterline
- Woody vegetation is less sensitive than grasses to oil
- Some oil can be trapped and pooled on the floodplain as water levels drop
- Penetration into the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

RESPONSE CONSIDERATIONS

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

ENVIRONMENTAL SENSITIVITY INDEX MAPS





Map 63
Delmarva Peninsula

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
Map ID	Type	Name	Contact
1	AIRPORT	CRIPPEN CREEK FARM	
2	AQUACULTURE	HARD CLAMS BASIC FOOD (GARDNER) RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
3	AQUACULTURE	HARD CLAMS HAMMER RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
4	AQUACULTURE	HARD CLAMS KILMON? RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
5	AQUACULTURE	HARD CLAMS TURNER RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
6	AQUACULTURE	HARD CLAMS UNKNOWN RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
7	AQUACULTURE	OYSTER COMMERCIAL BRITTINGHAM RON RF#2001-1230	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
8	AQUACULTURE	OYSTER NON-COMM REIGER, GEORGE RF#99-1552	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
9	EPA FACILITY	PERDUE FARMS INC., ACCOMAC PROCESSING PLANT	DIRECTOR OF OPERATIONS 757-787-5314
10	REPEATED MEASUREMENT SITE	NWLON - WACHAPREAGUE, WACHAPREAGUE CHANNEL	NATIONAL WATER LEVEL PROGRAM 301-713-2815

DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Contact
11	ARTIFICIAL REEF	WACHAPREAGUE	
12	NATURE CONSERVANCY	CEDAR ISLAND	THE NATURE CONSERVANCY 703-841-5300
13	NATURE CONSERVANCY	METOMPKIN ISLAND	THE NATURE CONSERVANCY 703-841-5300
14	NATURE CONSERVANCY	PARRAMORE ISLAND	THE NATURE CONSERVANCY 703-841-5300
15	WILDLIFE REFUGE	CHINCOTEAGUE NATIONAL WILDLIFE REFUGE	USFWS AND THE NATURE CONSERVANCY 757-336-6122

ALSO PRESENT IN MAPPED AREA (POLYGONS)			
Type	Name	Contact	Phone
STATE PROTECTED AREA	MUTTON HUNK FEN	VA DEPT OF CONSERVATION AND RECREATION	
STATE PROTECTED AREA	TIDAL LANDS	VA MARINE RESOURCES COMMISSION	

JURISDICTIONS			
COUNTY:	ACCOMACK COUNTY	FEMA:	REGION 1
COAST GUARD:	DISTRICT 5, SECTOR HAMPTON ROADS	EPA:	REGION 3
USACE:	NORTH ATLANTIC DIVISION, NORFOLK DISTRICT		

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	12,254.12	19.15
10B	Freshwater Marshes	622.99	0.97
10C	Swamps	2,058.54	3.22
10D	Scrub and Shrub Wetlands	618.21	0.97
9A	Sheltered Tidal Flats	2,280.24	3.56
7	Exposed Tidal Flats	138.86	0.22

ESI SHORELINE HABITAT TYPES

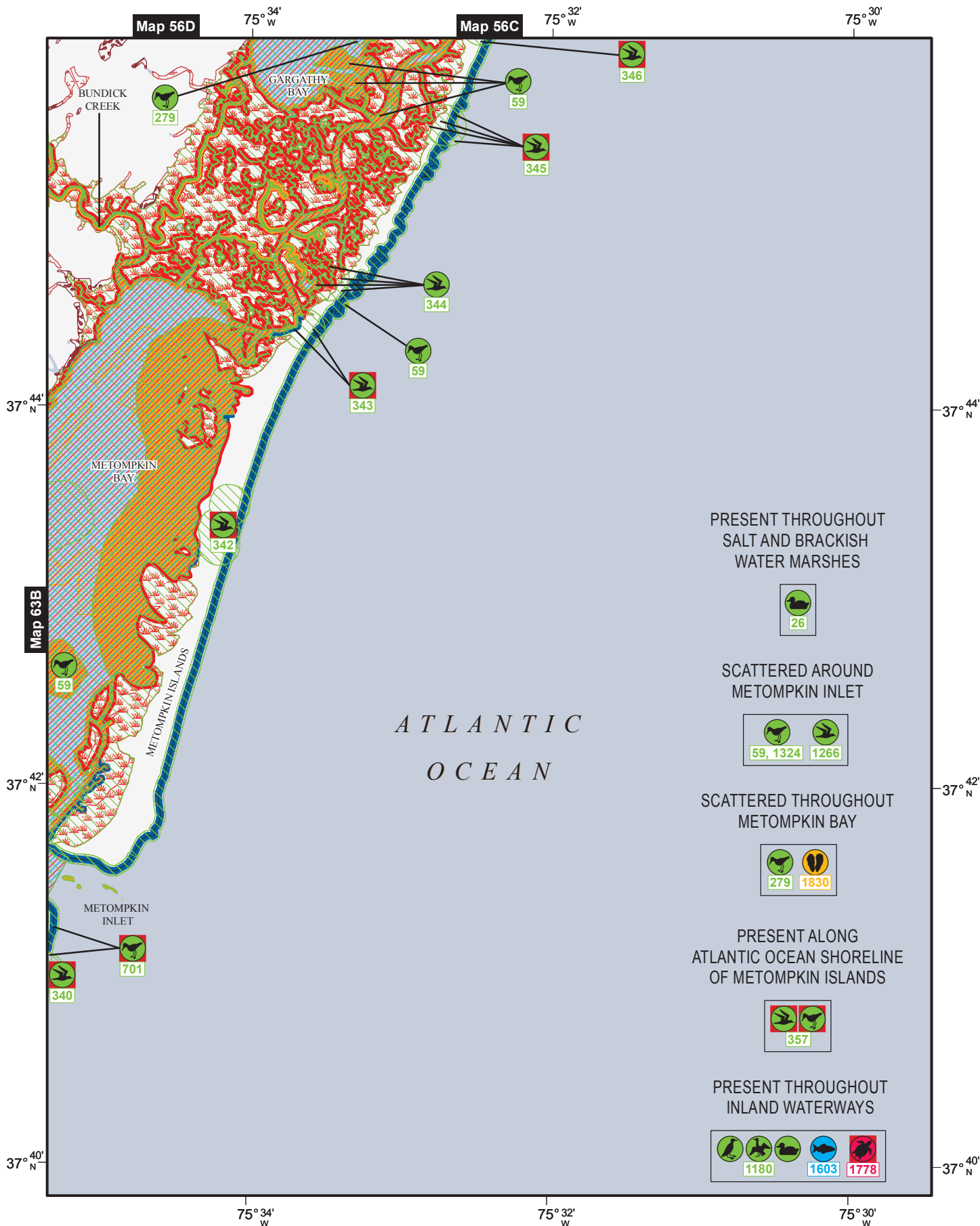
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	825,833.88	513.15	48%
10C	Swamps	11,812.57	7.34	1%
10D	Scrub and Shrub Wetlands	2,962.40	1.84	< 1%
9A	Sheltered Tidal Flats	819,152.55	509.00	48%
9B	Vegetated Low Banks	4,421.50	2.75	< 1%
8B	Sheltered, Solid Man-Made Structures	238.54	0.15	< 1%
7	Exposed Tidal Flats	4,913.33	3.05	< 1%
3A	Fine to Medium Grained Sand Beaches	43,581.45	27.08	3%

Total ESI Shoreline: 1,712,916.22 Total ESI Shoreline: 1,064.36
 Total Shoreline: 862,071.16 Total Shoreline: 535.67

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

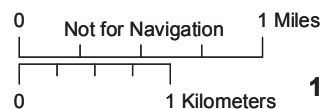




Map 63A
Delmarva Peninsula



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



1:50,000



Map 63A
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
							J	F	M	A	M	J	J	A	S	O	N	D				
26	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering			10,000S													-	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
59	Shorebird	Shorebirds	Migration			Potential													-	May-Jun	Aug-Oct	-
279	Shorebird	Shorebirds	Migration			High													-	May-Jun	Aug-Oct	-
340	Shorebird	Whimbrel	Migration			222 Birds/Km2													-	May-Jun	-	-
	Gull/Tern	Black skimmer	Nesting		E/-	307 Pairs													May-Sep	-	-	-
342	Gull/Tern	Common tern	Nesting			10 Pairs													May-Aug	-	-	-
	Gull/Tern	Common tern	Nesting			1 Pair													May-Aug	-	-	-
343	Gull/Tern	Least tern	Nesting		T/-	57 Pairs													May-Jul	-	-	-
	Gull/Tern	Least tern	Nesting		T/-	12 Pairs													May-Jul	-	-	-
344	Gull/Tern	Forster's tern	Nesting			17 Pairs													May-Jul	-	-	-
345	Gull/Tern	Common tern	Nesting			33 Pairs													May-Aug	-	-	-
346	Gull/Tern	Least tern	Nesting		T/-	87 Pairs													May-Jul	-	-	-
	Gull/Tern	Black skimmer	Nesting		E/-	17 Pairs													May-Sep	-	-	-
357	Gull/Tern	Common tern	Nesting			3 Pairs													May-Aug	-	-	-
	Gull/Tern	Black skimmer	General Distribution		E/-	100S													-	-	-	-
	Gull/Tern	Least tern	General Distribution		T/-	100S													-	-	-	-
	Shorebird	American oystercatcher	Nesting			91 Pairs													Apr-Aug	-	-	-
	Shorebird	Black-bellied plover	Migration			100S													-	May-Jun	Sep-Dec	-
	Shorebird	Dunlin	Migration			1000S													-	Apr-May	Oct-Nov	-
	Shorebird	Red knot	Migration		T/T	T Up To 104 Birds/Km													-	Apr-Jun	Jul-Oct	-
	Shorebird	Ruddy turnstone	Migration			100S													-	May	Aug	-
	Shorebird	Sanderling	Migration			1000S													-	May-Jun	Aug-Oct	-
	Shorebird	Semipalmated plover	Migration			100S													-	Apr-Jun	Jul-Nov	-
	Shorebird	Semipalmated sandpiper	Migration			1000S													-	Apr-Jun	Jul-Oct	-
	Shorebird	Western sandpiper	Migration			100S													-	Mar	Sep-Oct	-
	Shorebird	Willet	Migration			100S													-	May	Jul	-
701	Shorebird	American oystercatcher	Nesting			83 Pairs													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Roosting			10 Pairs													-	-	-	-
	Shorebird	Piping plover	Nesting		E/T	1-30 Nests													Apr-Aug	-	-	-
	Shorebird	Red knot	Migration		T/T	T Up To 136 Birds/Km													-	Apr-Jun	Jul-Oct	-
	Shorebird	Wilson's plover	Nesting		E/E	1-7 Nests													Apr-Aug	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
1180	Diving	Red-throated loon	Wintering			100S													-	-	-	-
	Pelagic	Northern gannet	Wintering			10S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			1,000S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering			1,000S													-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-	-
	Waterfowl	Scoters	Wintering			1,000S													-	-	-	-
	Gull/Tern	Forster's tern	Nesting			15 Pairs													May-Jul	-	-	-
1324	Shorebird	American oystercatcher	Wintering			-													-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
1603	Marine Pelagic	Sandbar shark	Nursery Area			-													-	-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS





Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
1778	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	Jul-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Rare													-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	-	May-Nov	May-Nov

INVERTEBRATES


Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1830	Bivalve	Eastern oyster	Harvest Area			-												Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Alcid	Alcids	Wintering			Present													-	-	-	-
	Diving	Common loon	Wintering			10S													-	-	-	-
		D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
		Grebes	Wintering			10S													-	-	-	-
		Red-throated loon	Wintering			10S													-	-	-	-
	Gull/Tern	Roseate tern	General Distribution	-/E	E	Very Rare													-	-	-	-
	Pelagic	Northern gannet	Wintering			100S													-	-	-	-


BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MDVA		Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Waterfowl	American black duck	Wintering			1,000S												-	-	-	-	-
		American wigeon	Wintering			100S												-	-	-	-	-
		Canada goose	Wintering			1,000S												-	-	-	-	-
		Long-tailed duck	Wintering			Present												-	-	-	-	-
		Mallard	Wintering			100S												-	-	-	-	-
		Northern pintail	Wintering			100S												-	-	-	-	-
		Northern shoveler	Wintering			10S												-	-	-	-	-
		Red-breasted merganser	Wintering			Present												-	-	-	-	-
		Scoters	Wintering			10,000S												-	-	-	-	-
		Snow goose	Wintering			10,000S												-	-	-	-	-
		Tundra swan	Wintering			10S												-	-	-	-	-



FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	American eel			-													-	-	-	-	Sep-Dec
		Atlantic sturgeon		-/E	E	-												-	-	-	-	Jan-Dec








REPTILES & AMPHIBIANS

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



MARINE MAMMALS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Manatee	West Indian manatee	-/E	E	Rare													-	-	-	-
	Whale	Fin whale	E/E	E	Common													-	-	-	-
		Humpback whale	E/E	E	Uncommon													-	-	-	-
		Humpback whale	E/E	E	Common													-	-	-	-
		N.A. right whale	E/E	E	Rare													-	-	-	-






BIRDS

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

FISH

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

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Great hammerhead													-	-	-	-	May-Oct
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleamose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern searobin													-	-	-	-	Mar-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Atlantic mackerel													-	-	-	-	Mar-Apr
	Blacktip shark													-	-	-	-	May-Oct
	Butterfish													-	-	-	May-Oct	-
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Crevalle jack													-	-	-	Jun-Oct	-

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Dusky shark													-	-	-	-	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep
	Spanish mackerel													-	-	-	-	May-Sep
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	Nov-May	Nov-May
	Thresher shark													-	-	-	-	May-Sep



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,641.31	2.56
10C	Swamps	26.83	0.04
10D	Scrub and Shrub Wetlands	35.28	0.06
9A	Sheltered Tidal Flats	655.08	1.02
7	Exposed Tidal Flats	3.33	0.01

ESI SHORELINE HABITAT TYPES

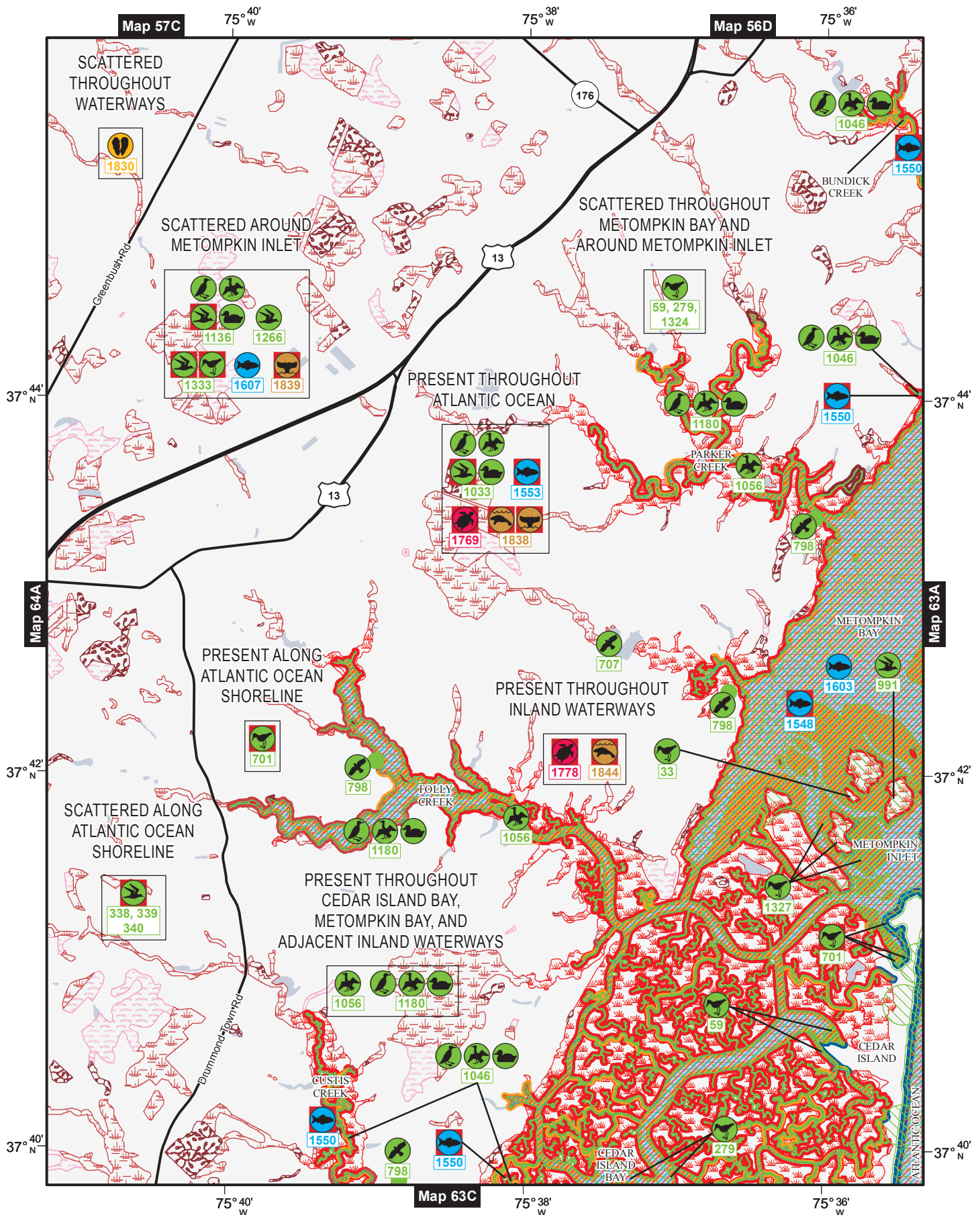
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	131,138.00	81.49	47%
10D	Scrub and Shrub Wetlands	407.57	0.25	< 1%
9A	Sheltered Tidal Flats	130,462.60	81.07	47%
3A	Fine to Medium Grained Sand Beaches	15,438.62	9.59	6%

Total ESI Shoreline: 277,446.80 Total ESI Shoreline: 172.40
 Total Shoreline: 144,102.43 Total Shoreline: 89.54

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

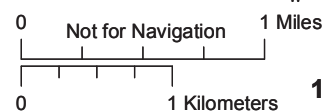




Map 63B
Delmarva Peninsula



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



1:50,000



Map 63B
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
33	Shorebird	American oystercatcher	Nesting				1 Pair													Apr-Aug	-	-	-
59	Shorebird	Shorebirds	Migration				Potential													-	May-Jun	Aug-Oct	-
279	Shorebird	Shorebirds	Migration				High													-	May-Jun	Aug-Oct	-
338	Shorebird	Whimbrel	Migration				222 Birds/Km2													-	May-Jun	-	-
339	Gull/Tern	Least tern	Nesting			T/-	41 Pairs													May-Jul	-	-	-
340	Gull/Tern	Least tern	Nesting			T/-	50 Pairs													May-Jul	-	-	-
340	Gull/Tern	Black skimmer	Nesting			E/-	307 Pairs													May-Sep	-	-	-
701	Gull/Tern	Common tern	Nesting				10 Pairs													May-Aug	-	-	-
701	Shorebird	American oystercatcher	Nesting				83 Pairs													Apr-Aug	-	-	-
701	Shorebird	American oystercatcher	Roosting				10 Pairs													-	-	-	-
701	Shorebird	Piping plover	Nesting			E/T	1-30 Nests													Apr-Aug	-	-	-
701	Shorebird	Red knot	Migration			T/T	Up To 136 Birds/Km													-	Apr-Jun	Jul-Oct	-
701	Shorebird	Wilson's plover	Nesting			E/E	1-7 Nests													Apr-Aug	-	-	-
707	Raptor	Bald eagle	Roosting				-													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
991	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-
991	Gull/Tern	Terns	Nesting				-													May-Aug	-	-	-
1033	Alcid	Alcids	Wintering				Present													-	-	-	-
1033	Diving	Common loon	Wintering				10S													-	-	-	-
1033	Diving	D. crested cormorant	Wintering				1,000S													-	Mar-May	Aug-Nov	-
1033	Diving	Grebes	Wintering				10S													-	-	-	-
1033	Diving	Red-throated loon	Wintering				10S													-	-	-	-
1033	Gull/Tern	Roseate tern	General Distribution			-/E	Very Rare													-	-	-	-
1033	Pelagic	Northern gannet	Wintering				100S													-	-	-	-
1033	Waterfowl	Long-tailed duck	Wintering				Present													-	-	-	-
1033	Waterfowl	Red-breasted merganser	Wintering				Present													-	-	-	-
1033	Waterfowl	Scoters	Wintering				10,000S													-	-	-	-
1046	Diving	Common loon	Wintering				10S													-	-	-	-
1046	Diving	D. crested cormorant	Wintering				1,000S													-	Mar-May	Aug-Nov	-
1046	Diving	Grebes	Wintering				10S													-	-	-	-
1046	Diving	Red-throated loon	Wintering				100S													-	-	-	-
1046	Pelagic	Northern gannet	Wintering				10S													-	-	-	-
1046	Waterfowl	Blue-winged teal	Migration				1,000S													-	Feb-Apr	Aug-Oct	-
1046	Waterfowl	Brant	Wintering				1,000S													-	-	-	-
1046	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
1046	Waterfowl	Common goldeneye	Wintering				10S													-	-	-	-
1046	Waterfowl	Gadwall	Wintering				1,000S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	Green-winged teal	Wintering				1,000S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				10S													-	-	-	-
	Waterfowl	Scoters	Wintering				1,000S													-	-	-	-
1056	Diving	Common loon	Wintering				10S													-	-	-	-
	Diving	D. crested cormorant	Wintering				1,000S													-	Mar-May	Aug-Nov	-
	Diving	Grebes	Wintering				10S													-	-	-	-
	Alcid	Alcids	Wintering				Present													-	-	-	-
	Diving	Red-throated loon	Wintering				10S													-	-	-	-
	Gull/Tern	Roseate tern	General Distribution				Very Rare													-	-	-	-
	Pelagic	Northern gannet	Wintering				100S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				Present													-	-	-	-
	Waterfowl	Red-breasted merganser	Wintering				Present													-	-	-	-
	Waterfowl	Scoters	Wintering				10,000S													-	-	-	-
1180	Diving	Red-throated loon	Wintering				100S													-	-	-	-
	Pelagic	Northern gannet	Wintering				10S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				1,000S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				1,000S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				1,000S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				1,000S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				10S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				10S													-	-	-	-
	Waterfowl	Scoters	Wintering				1,000S													-	-	-	-
	Gull/Tern	Forster's tern	Nesting				15 Pairs													May-Jul	-	-	-
	Shorebird	American oystercatcher	Wintering				-													-	-	-	-
	Shorebird	American oystercatcher	Nesting				2 Pair													Apr-Aug	-	-	-
1333	Shorebird	American oystercatcher	Wintering				-													-	-	-	-
	Gull/Tern	Black skimmer	General Distribution				100S													-	-	-	-
	Gull/Tern	Least tern	General Distribution				100S													-	-	-	-
	Shorebird	American oystercatcher	Nesting				91 Pairs													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Wintering				-													-	-	-	-
	Shorebird	Black-bellied plover	Migration				100S													-	May-Jun	Sep-Dec	-
	Shorebird	Dunlin	Migration				1000S													-	Apr-May	Oct-Nov	-
	Shorebird	Red knot	Migration				T/T Up To 104 Birds/Km													-	Apr-Jun	Jul-Oct	-
	Shorebird	Ruddy turnstone	Migration				100S													-	May	Aug	-
	Shorebird	Sanderling	Migration				1000S													-	May-Jun	Aug-Oct	-
	Shorebird	Semipalmated plover	Migration				100S													-	Apr-Jun	Jul-Nov	-
	Shorebird	Semipalmated sandpiper	Migration				1000S													-	Apr-Jun	Jul-Oct	-
	Shorebird	Western sandpiper	Migration				100S													-	Mar	Sep-Oct	-
	Shorebird	Willet	Migration				100S													-	May	Jul	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults							
				S	F		J	F	M	A	M	J	J	A	S	O	N	D											
1548	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-									Jan-Dec
1550	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-									Jan-Dec
1553	Marine Pelagic	Sandbar shark	Nursery Area			-													-	-									May-Sep
	Diadromous	American eel	Migration			-													-	-									Sep-Dec
1603	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-									Jan-Dec
	Marine Pelagic	Sandbar shark	Nursery Area			-													-	-									May-Sep
1607	Diadromous	American eel	Migration			-													-	-									Sep-Dec

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Hatch	Internest	Juveniles	Adults	
				S	F	J	F	M	A	M	J	J	A	S	O	N	D					
1769	Turtle	Green sea turtle	General Distribution	T/T	T	Common													-	-	-	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	May-Dec*	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common													-	-	Apr-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Uncommon													-	-	Nov-Dec	-
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Rare													-	-	Mar-Dec*	Mar-Dec*
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Common													-	-	May-Jun	May-Jun
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant													-	-	Apr-Oct	Apr-Oct
1778	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	Nov-Dec	Nov-Dec
	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	Jul-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Rare													-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	May-Nov	May-Nov


INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D
1830	Bivalve	Eastern oyster	Harvest Area			-													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec

MARINE MAMMALS







Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
1838	Manatee	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	
	Whale	Fin whale	General Distribution	E/E	E	Common													-	-	-	
	Whale	Humpback whale	General Distribution	E/E	E	Common													-	-	-	
	Whale	Humpback whale	General Distribution	E/E	E	Uncommon													-	-	-	
1839	Whale	N.A. right whale	General Distribution	E/E	E	Rare													-	-	-	
	Whale	Fin whale	General Distribution	E/E	E	Common													-	-	-	
	Whale	Humpback whale	General Distribution	E/E	E	Common													-	-	-	
	Whale	Humpback whale	General Distribution	E/E	E	Uncommon													-	-	-	
1844	Whale	N.A. right whale	General Distribution	E/E	E	Rare													-	-	-	
	Manatee	West Indian manatee	General Distribution	-/E	E	Rare													-	-	-	

BIRDS


Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
					J	F	M	A	M	J	J	A	S	O	N	D				
	American black duck	Nesting		Present													Apr-Jul	-	-	-
	American black duck	Wintering		1,000S													-	-	-	-
	American wigeon	Wintering		100S													-	-	-	-
	Blue-winged teal	Migration		100S													-	Feb-Apr	Aug-Oct	-
	Brant	Wintering		10,000S													-	-	-	-
	Canada goose	Nesting		Present													Mar-Aug	-	-	Jun-Jul
	Canada goose	Wintering		1,000S													-	-	-	-
	Gadwall	Wintering		100S													-	-	-	-
	Green-winged teal	Wintering		100S													-	-	-	-
	Mallard	Nesting		Present													Mar-Aug	-	-	Jul-Aug
	Mallard	Wintering		100S													-	-	-	-
	Northern pintail	Wintering		100S													-	-	-	-
	Northern shoveler	Wintering		10S													-	-	-	-
	Snow goose	Wintering		10,000S													-	-	-	-
	Tundra swan	Wintering		10S													-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS


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

FISH



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

Delmarva Peninsula: Map 63B

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Clemonose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern searobin													-	-	-	-	Mar-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Oct-Jun	-
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Atlantic mackerel													-	-	-	-	Mar-Apr
	Blacktip shark													-	-	-	-	May-Oct
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Butterfish													-	-	-	May-Oct	-
	Crevalle jack													-	-	-	Jun-Oct	-
	Dusky shark													-	-	-	-	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep
	Scalloped hammerhead													-	-	-	May-Oct	May-Oct
	Spanish mackerel													-	-	-	-	May-Sep
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	Nov-May	Nov-May
	Thresher shark													-	-	-	-	May-Sep



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	3,068.41	4.79
10B	Freshwater Marshes	508.25	0.79
10C	Swamps	1,620.57	2.53
10D	Scrub and Shrub Wetlands	348.94	0.55
9A	Sheltered Tidal Flats	306.08	0.48
7	Exposed Tidal Flats	76.45	0.12

ESI SHORELINE HABITAT TYPES

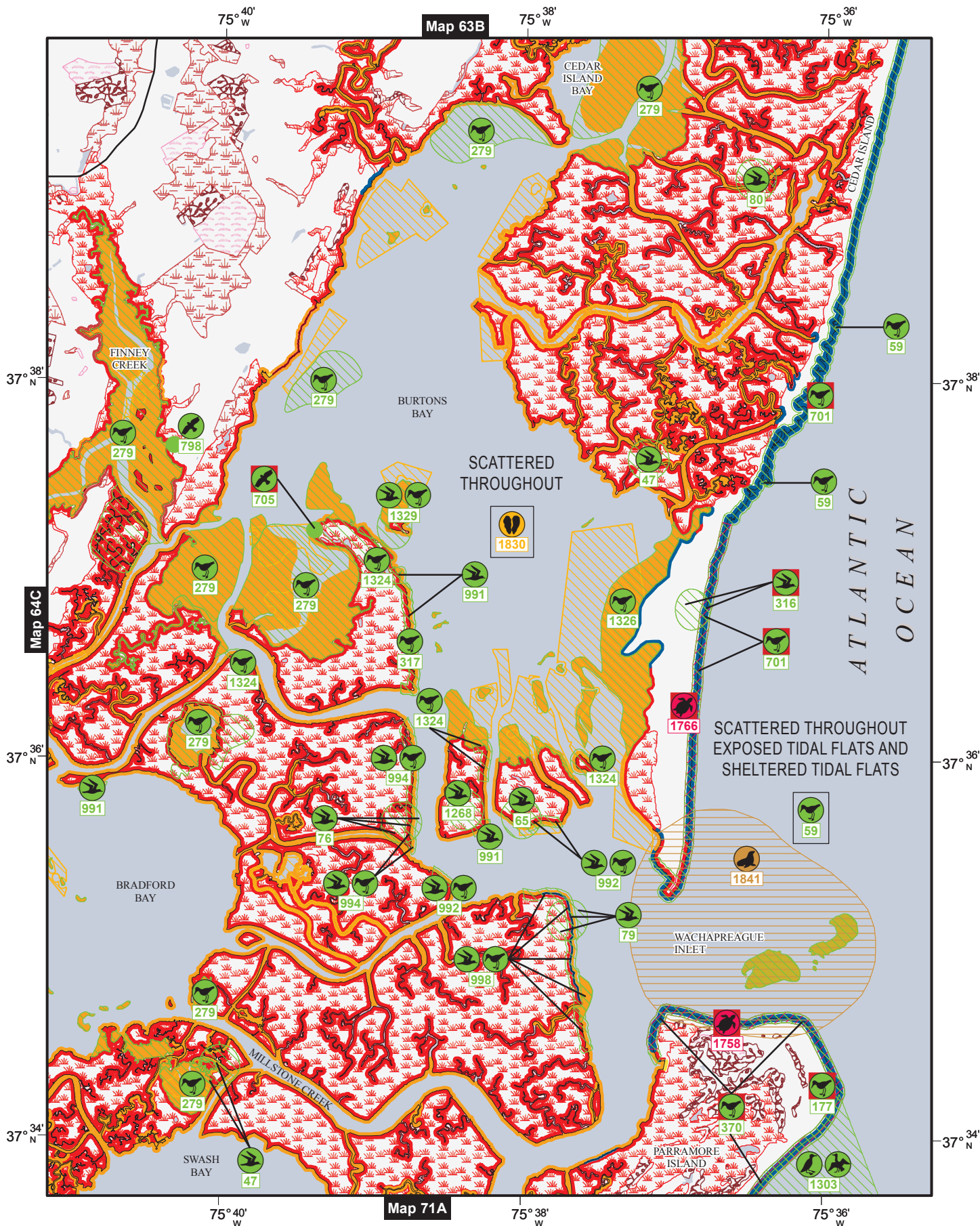
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	261,324.31	162.38	48%
10C	Swamps	9,349.47	5.81	2%
10D	Scrub and Shrub Wetlands	2,554.83	1.59	< 1%
9A	Sheltered Tidal Flats	253,313.01	157.40	47%
9B	Vegetated Low Banks	2,425.52	1.51	< 1%
7	Exposed Tidal Flats	4,913.33	3.05	1%
3A	Fine to Medium Grained Sand Beaches	7,064.87	4.39	1%
Total ESI Shoreline:		540,945.33	336.13	
Total Shoreline:		266,445.93	165.56	

Total ESI Shoreline: 540,945.33
Total Shoreline: 266,445.93

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 63C
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
47	Gull/Tern	Forster's tern	Nesting				6 Pairs													May-Jul	-	-	-
59	Shorebird	Shorebirds	Migration				Potential													-	May-Jun	Aug-Oct	-
65	Gull/Tern	Laughing gull	Nesting				28 Pairs													Apr-Aug	-	-	-
76	Gull/Tern	Forster's tern	Nesting				25 Pairs													May-Jul	-	-	-
79	Gull/Tern	G. black-backed gull	Nesting				20 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting				24 Pairs													May-Aug	-	-	-
80	Gull/Tern	Forster's tern	Nesting				14 Pairs													May-Jul	-	-	-
177	Shorebird	American oystercatcher	Nesting				8 Pairs													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Roosting				4 Pairs													-	-	-	-
	Shorebird	Piping plover	Nesting			E/T	T													Apr-Aug	-	-	-
279	Shorebird	Shorebirds	Migration				High													-	May-Jun	Aug-Oct	-
316	Shorebird	Whimbrel	Migration				222 Birds/Km2													-	May-Jun	-	-
	Gull/Tern	Black skimmer	Nesting			E/-	86 Pairs													May-Sep	-	-	-
	Gull/Tern	Common tern	Nesting				69 Pairs													May-Aug	-	-	-
	Gull/Tern	Gull-billed tern	Nesting			E/T	39 Pairs													May-Jul	-	-	-
	Gull/Tern	Least tern	Nesting			T/-	17 Pairs													May-Jul	-	-	-
317	Shorebird	American oystercatcher	Nesting				6 Pairs													Apr-Aug	-	-	-
370	Shorebird	Dunlin	Migration			T/T	100S													-	Apr-May	Oct-Nov	-
	Shorebird	Red knot	Migration				Up To 107 Birds/Km													-	Apr-Jun	Jul-Oct	-
	Shorebird	Sanderling	Migration				100S													-	May-Jun	Aug-Oct	-
701	Shorebird	American oystercatcher	Nesting				83 Pairs													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Roosting			E/T	10 Pairs													-	-	-	-
	Shorebird	Piping plover	Nesting			T/T	1-30 Nests													Apr-Aug	-	-	-
	Shorebird	Red knot	Migration			E/E	Up To 136 Birds/Km													-	Apr-Jun	Jul-Oct	-
	Shorebird	Wilson's plover	Nesting			-/T	1-7 Nests													Apr-Aug	-	-	-
705	Raptor	Peregrine falcon	Nesting				-													Feb-Jun	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
991	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting				-													May-Aug	-	-	-
992	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting				-													May-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting				1 Pair													Apr-Aug	-	-	-
994	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting				-													May-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting				4 Pairs													Apr-Aug	-	-	-
998	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting				-													May-Aug	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	J	F	M	A	M	J	J	A	S	O	N	D				
1268	Shorebird	American oystercatcher	Nesting			5 Pairs												Apr-Aug	-	-	-
	Gull/Tern	Forster's tern	Nesting			15 Pairs												May-Jul	-	-	-
1303	Gull/Tern	Laughing gull	Nesting			65 Pairs												Apr-Aug	-	-	-
	Diving	Common loon	Wintering			100S												-	-	-	-
	Pelagic	Northern gannet	Wintering			1,000S												-	-	-	-
1324	Shorebird	American oystercatcher	Wintering			-												-	-	-	-
1326	Shorebird	American oystercatcher	Wintering			-												-	-	-	-
	Shorebird	Shorebirds	Migration			Potential												-	May-Jun	Aug-Oct	-
1329	Gull/Tern	Common tern	Nesting			28 Pairs												May-Aug	-	-	-
	Gull/Tern	Laughing gull	Nesting			10 Pairs												Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting			2 Pairs												Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Wintering			-												-	-	-	-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1758	Turtle	Loggerhead sea turtle	Nesting	T/T	T	Potential												May-Aug	Jun-Oct	-	Jun-Oct	May-Aug
1766	Turtle	Loggerhead sea turtle	Nesting	T/T	T	0-1 Nest												May-Aug	Jun-Oct	-	Jun-Oct	May-Aug

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1830	Bivalve	Eastern oyster	Harvest Area			-												Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec

MARINE MAMMALS


Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1841	Pinniped	Gray seal	Haul Out			-												-	-	-	-	-
	Pinniped	Harbor seal	Haul Out			24 Seals												-	-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)



BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt	
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
Alcid	Alcids	Wintering			Present													-	-	-	-	-
	Diving	Wintering			10S													-	-	-	-	-
	Common loon	Wintering			1,000S													-	Mar-May	Aug-Nov	-	-
	D. crested cormorant	Wintering			10S													-	-	-	-	-
	Grebes	Wintering			10S													-	-	-	-	-
	Red-throated loon	Wintering			10S													-	-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-	-
	Roseate tern	General Distribution	-JE	E	Very Rare													-	-	-	-	-
Gull/Tern	Northern gannet	Wintering			10S													-	-	-	-	-
	Pelagic	Wintering			100S													-	-	-	-	-


BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	American black duck		Nesting			Present													Apr-Jul	-	-	-
	American black duck		Wintering			1,000S													-	-	-	-
	American wigeon		Wintering			100S													-	-	-	-
	Blue-winged teal		Migration			100S													-	Feb-Apr	Aug-Oct	-
	Blue-winged teal		Migration			1,000S													-	Feb-Apr	Aug-Oct	-
	Brant		Wintering			1,000S													-	-	-	-
	Brant		Wintering			10,000S													-	-	-	-
	Bufflehead		Wintering			1,000S													-	-	-	-
	Canada goose		Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Canada goose		Wintering			1,000S													-	-	-	-
	Common goldeneye		Wintering			10S													-	-	-	-
	Gadwall		Wintering			1,000S													-	-	-	-
	Gadwall		Wintering			100S													-	-	-	-
	Green-winged teal		Wintering			1,000S													-	-	-	-
	Green-winged teal		Wintering			100S													-	-	-	-
	Long-tailed duck		Wintering			Present													-	-	-	-
	Long-tailed duck		Wintering			10S													-	-	-	-
	Mallard		Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Mallard		Wintering			100S													-	-	-	-
	Mergansers		Wintering			100S													-	-	-	-
Northern pintail		Wintering			100S													-	-	-	-	
Northern shoveler		Wintering			10S													-	-	-	-	
Red-breasted merganser		Wintering			Present													-	-	-	-	
Ruddy duck		Wintering			10S													-	-	-	-	
Scoters		Wintering			1,000S													-	-	-	-	
Scoters		Wintering			10,000S													-	-	-	-	
Snow goose		Wintering			10,000S													-	-	-	-	
Tundra swan		Wintering			10S													-	-	-	-	



FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	American eel			-													-	-	-	Jan-May	Sep-Dec
		Atlantic sturgeon			-													-	-	-	-	Jan-Dec
	Marine Pelagic	Sandbar shark		-/E	-													-	-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS







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

MARINE MAMMALS

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




ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS





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

FISH


Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Alewife													-	-	-	Aug-Nov	Feb-Jun
	Alewife													-	-	-	Apr-May	Mar-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	Aug-Nov	Feb-Jul
	American shad													-	-	-	Aug-Nov	Apr-Jun
	Blueback herring													-	-	-	Apr-Oct	Apr-Jun
	Blueback herring													-	-	-	Aug-Nov	Feb-Jul
	Hickory shad													-	-	-	Jun-Oct	Feb-Jun
	Hickory shad													-	-	-	Feb-Sep	Feb-Sep
	Striped bass													-	-	-	May-Oct	Jan-Dec
	Striped bass													-	-	-	-	Jan-Dec
	Atl. sharpnose shark													-	-	-	-	May-Oct
	Atlantic croaker													-	-	-	Aug-Dec	May-Nov
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	Feb-Jun	Feb-Jun
	Atlantic menhaden													-	-	-	Jan-Dec	May-Oct
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Black drum													-	-	-	May-Oct	Jan-Dec
	Black drum													-	-	-	-	Apr-Oct
	Black sea bass													Jun-Oct	-	-	Apr-Oct	Apr-Oct
	Black sea bass													-	-	-	Apr-Dec	Apr-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Bluefish													-	-	-	May-Nov	Apr-Nov
	Kingfishes													Apr-Sep	-	-	-	Apr-Oct
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	-	Jan-Dec
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Anchovies													-	-	-	-	May-Nov
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Great hammerhead													-	-	-	-	May-Oct
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleamose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern searobin													-	-	-	-	Mar-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Oct-Jun	-
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Atlantic mackerel													-	-	-	-	Mar-Apr
	Blacktip shark													-	-	-	-	May-Oct
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Butterfish													-	-	-	May-Oct	-
	Crevalle jack													-	-	-	Jun-Oct	-
	Dusky shark													-	-	-	-	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep
	Spanish mackerel													-	-	-	-	May-Sep
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	Nov-May	Nov-May
	Thresher shark													-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	7,544.40	11.79
10B	Freshwater Marshes	114.74	0.18
10C	Swamps	411.15	0.64
10D	Scrub and Shrub Wetlands	233.98	0.37
9A	Sheltered Tidal Flats	1,319.08	2.06
7	Exposed Tidal Flats	59.09	0.09

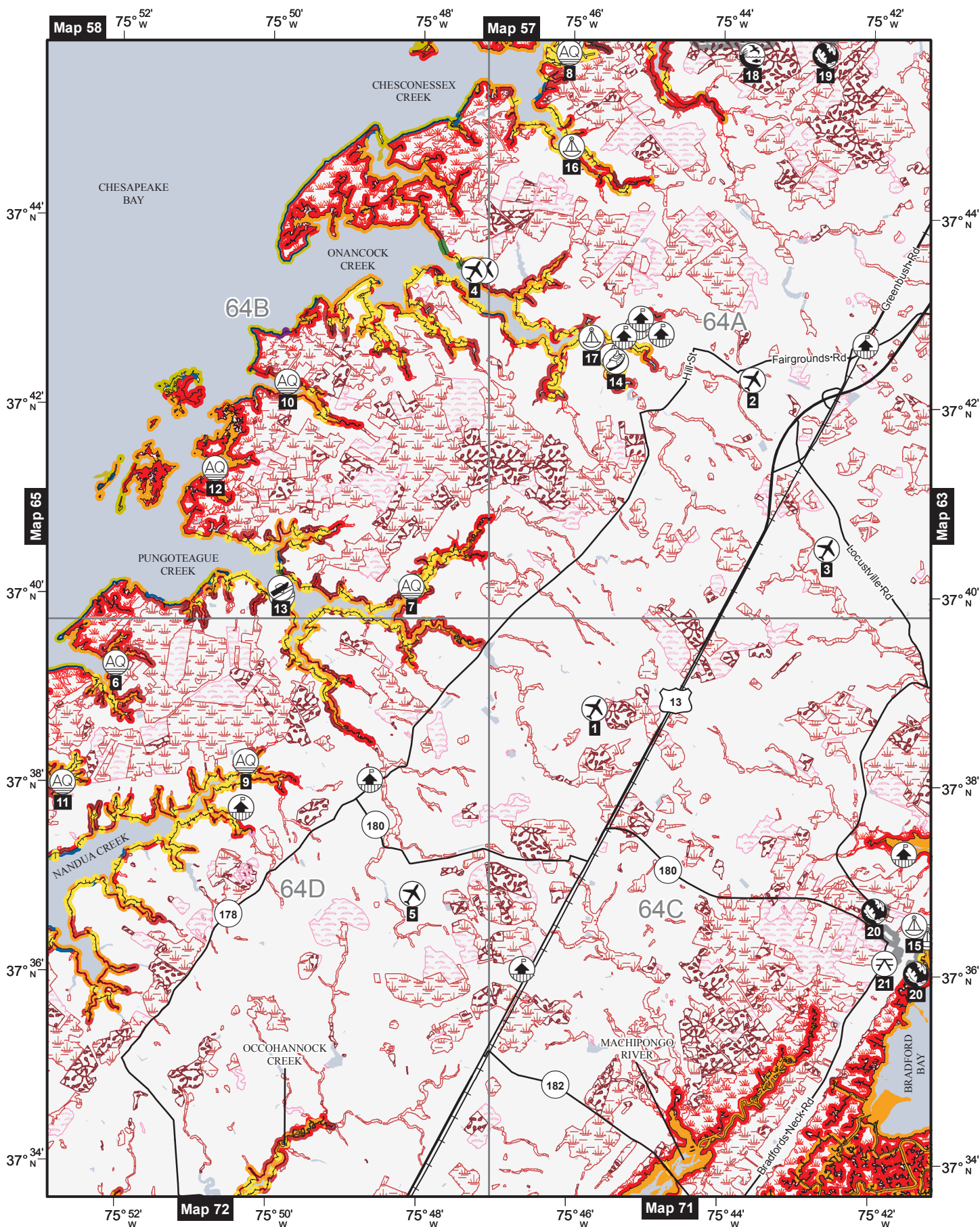
ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	433,371.58	269.29	48%
10C	Swamps	2,463.10	1.53	< 1%
9A	Sheltered Tidal Flats	435,376.94	270.53	49%
9B	Vegetated Low Banks	1,995.98	1.24	< 1%
8B	Sheltered, Solid Man-Made Structures	238.54	0.15	< 1%
3A	Fine to Medium Grained Sand Beaches	21,077.96	13.10	2%
Total ESI Shoreline:		894,524.09	555.83	
Total Shoreline:		451,522.80	280.56	

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

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





Map 64
Delmarva Peninsula



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

0 2 Miles
Not for Navigation
0 2 Kilometers

1:100,000



Map 64
Delmarva Peninsula

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
Map ID	Type	Name	Contact
1	AIRPORT	ACCOMACK COUNTY	
2	AIRPORT	JOHNSON FLD	
3	AIRPORT	ONLEY	
4	AIRPORT	PEACE AND PLENTY FARM	
5	AIRPORT	THE SALMON FARM	
6	AQUACULTURE	OYSTER COMMERCIAL TEELING, ANDREW RF#90-0025	CHIP NEKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
7	AQUACULTURE	OYSTER NON-COMM BARNES RF#99-1480	CHIP NEKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
8	AQUACULTURE	OYSTER NON-COMM BRENNAN, E.T. RF#00-1730	CHIP NEKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
9	AQUACULTURE	OYSTER NON-COMM BROWN, WILLIAM T. RF#2000-1412	CHIP NEKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
10	AQUACULTURE	OYSTER NON-COMM HANEY RF#99-1572	CHIP NEKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
11	AQUACULTURE	OYSTER NON-COMM HEINRICHS RF#01-1464	CHIP NEKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
12	AQUACULTURE	OYSTER NON-COMM NEGLEY, GERRY RF#01-1444	CHIP NEKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254
13	BOAT RAMP	HARBORTON	
14	FERRY	ONANCOCK FERRY	LENE PENNINGTON, VDGIF 804-367-0058
15	REPEATED MEASUREMENT SITE	DB - NOS, 8631044 - WACHAPREAGUE, VA	NATIONAL COASTAL DATA DEVELOPMENT CENTER 866-732-2382
16	REPEATED MEASUREMENT SITE	WQ - STATION CS-3	CHESAPEAKE BAY PROGRAM 800-968-7229
17	REPEATED MEASUREMENT SITE	WQ - STATION ON-3	CHESAPEAKE BAY PROGRAM 800-968-7229

DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Contact
18	MANAGEMENT AREA	LEVEL PONDS	VA DEPT OF GAME AND INLAND FISHERIES
19	NATURE CONSERVANCY	THE NATURE CONSERVANCY LAND HOLDING	THE NATURE CONSERVANCY 703-841-5300
20	NATURE CONSERVANCY	WACHAPREAGUE FEE	THE NATURE CONSERVANCY 703-841-5300
21	PARK	WACHAPREAGUE PARK	ACCOMACK COUNTY

ALSO PRESENT IN MAPPED AREA (POINTS)			
Type	Name	Contact	Phone
COAST GUARD	STA WACHAPREAGUE		757-787-9526

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

JURISDICTIONS			
COUNTY:	ACCOMACK COUNTY	FEMA:	REGION 1
COAST GUARD:	DISTRICT 5, SECTOR HAMPTON ROADS	EPA:	REGION 3
USACE:	NORTH ATLANTIC DIVISION, NORFOLK DISTRICT		

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	5,183.18	8.10
10B	Freshwater Marshes	4,668.40	7.29
10C	Swamps	13,708.26	21.42
10D	Scrub and Shrub Wetlands	4,232.10	6.61
9A	Sheltered Tidal Flats	330.17	0.52
7	Exposed Tidal Flats	33.21	0.05



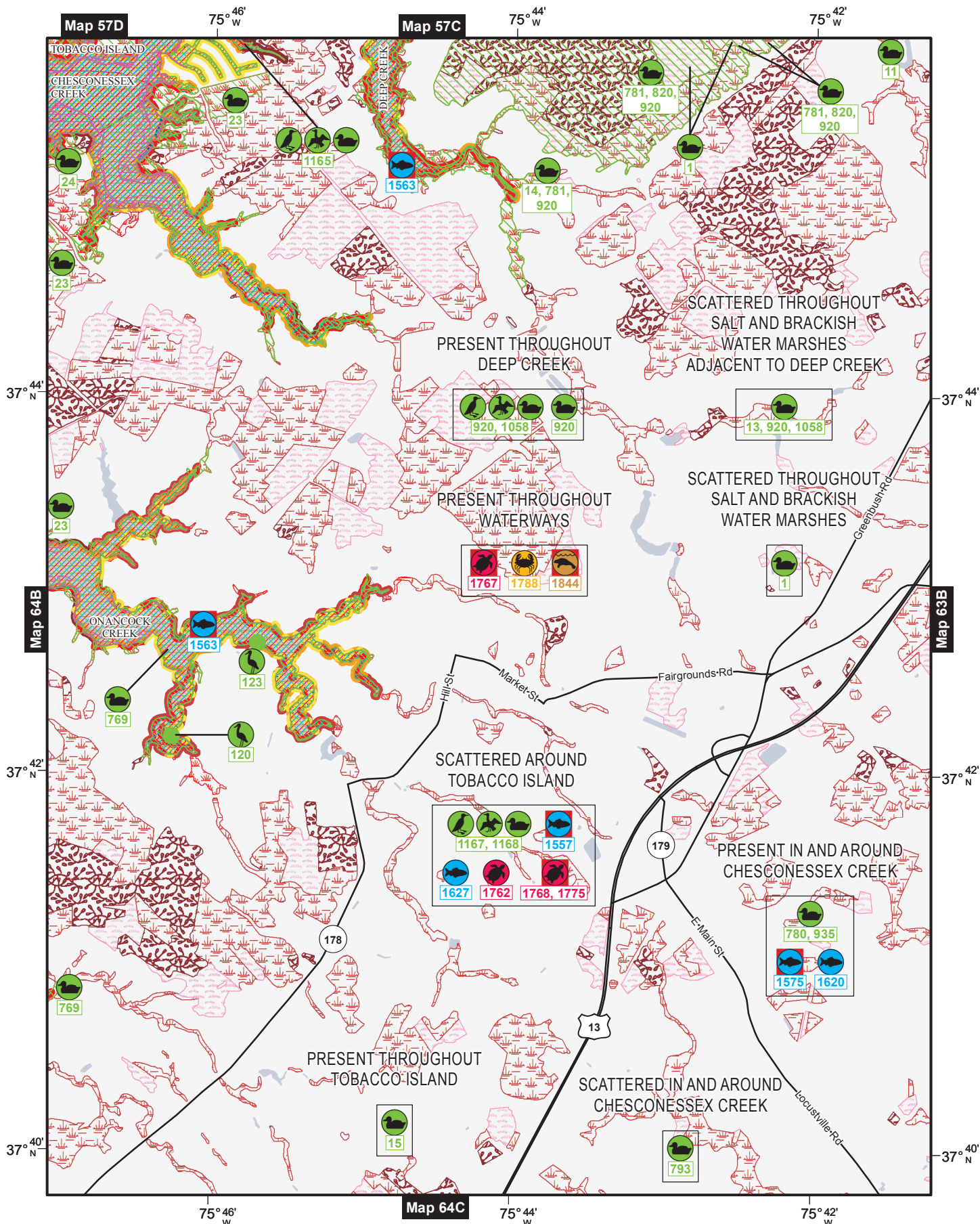
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	439,047.40	272.81	42%
10B	Freshwater Marshes	95.17	0.06	< 1%
10C	Swamps	57,360.31	35.64	5%
10D	Scrub and Shrub Wetlands	27,064.77	16.82	3%
9A	Sheltered Tidal Flats	384,823.75	239.12	37%
9B	Vegetated Low Banks	60,961.38	37.88	6%
8B	Sheltered, Solid Man-Made Structures	26,457.27	16.44	3%
8C	Sheltered Riprap	4,457.07	2.77	< 1%
7	Exposed Tidal Flats	21,613.57	13.43	2%
6B	Riprap	478.64	0.30	< 1%
3A	Fine to Medium Grained Sand Beaches	26,336.99	16.37	3%
1B	Exposed, Solid Man-Made Structures	404.38	0.25	< 1%
Total ESI Shoreline:		1,049,100.71	651.88	
Total Shoreline:		475,082.23	295.20	

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

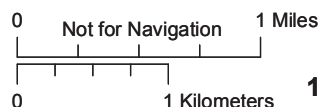




Map 64A
Delmarva Peninsula



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



1:50,000

Map 64A
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
1	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	American black duck	Wintering			100S													-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering			10S													-	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Canada goose	Wintering			1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	Northern pintail	Wintering			10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering			Present													-	-	-	-
	Waterfowl	Snow goose	Wintering			100S													-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-
	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	American black duck	Wintering			100S													-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
15	Waterfowl	American black duck	Nesting				Present													Apr-Jul	-	-	-
	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Northern pintail	Wintering				10S													-	-	-	-
	Waterfowl	Snow goose	Wintering				100S													-	-	-	-
23	Waterfowl	American black duck	Nesting				Present													Apr-Jul	-	-	-
	Waterfowl	American black duck	Wintering				1,000S													-	-	-	-
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering				1,000S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				Present													-	-	-	-
	Waterfowl	Redhead	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S													-	-	-	-
	Waterfowl	Scaup	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
24	Waterfowl	American black duck	Nesting				Present													Apr-Jul	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Redhead	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				10S													-	-	-	-
	Waterfowl	Scaup	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
120	Wading	Great blue heron	Nesting				5 Nests													Feb-Jun	-	-	-
	Wading	Great blue heron	Nesting				14 Nests													Feb-Jun	-	-	-
	Waterfowl	American black duck	Wintering				1,000S													-	-	-	-
	Waterfowl	American black duck	Wintering				1,000S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				1,000S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				Present													-	-	-	-
	Waterfowl	Redhead	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S													-	-	-	-
	Waterfowl	Scaup	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
780	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Brant	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				Present													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
781	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
793	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Redhead	Wintering				100S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				10S													-	-	-	-
	Waterfowl	Scaup	Wintering				10S													-	-	-	-
820	Waterfowl	American black duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				1,000S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canvasback	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				1,000S													-	-	-	-
	Waterfowl	Mallard	Wintering				1,000S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				10S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				100S													-	-	-	-
920	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Northern pintail	Wintering				10S													-	-	-	-
935	Waterfowl	American black duck	Wintering				1,000S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				1,000S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
1058	Waterfowl	Ruddy duck	Wintering				100S													-	-	-	-
	Waterfowl	Brant	Wintering				10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				Present													-	-	-	-
	Waterfowl	Snow goose	Wintering				100S													-	-	-	-
1165	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
	Diving	Common loon	Wintering				Present													-	-	-	-
	Diving	Grebes	Wintering				10S													-	-	-	-
	Diving	Red-throated loon	Wintering				100S													-	-	-	-
	Pelagic	Northern gannet	Wintering				Present													-	-	-	-
	Waterfowl	American black duck	Wintering				1,000S													-	-	-	-
	Waterfowl	American wigeon	Wintering				1,000S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				1,000S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering				1,000S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				1,000S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				1,000S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-
	Waterfowl	Northern pintail	Wintering				10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				Present													-	-	-	-
	Waterfowl	Redhead	Wintering				1,000S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				Present													-	-	-	-
	Waterfowl	Ruddy duck	Wintering				10,000S													-	-	-	-
	Waterfowl	Scaup	Wintering				100S													-	-	-	-
	Waterfowl	Scoters	Wintering				1,000S													-	-	-	-
1166	Waterfowl	Snow goose	Wintering				100S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
	Diving	Common loon	Wintering				Present													-	-	-	-
	Diving	Grebes	Wintering				10S													-	-	-	-
	Diving	Red-throated loon	Wintering				100S													-	-	-	-
	Pelagic	Northern gannet	Wintering				Present													-	-	-	-
	Waterfowl	American black duck	Wintering				1,000S													-	-	-	-
	Waterfowl	American wigeon	Wintering				1,000S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				1,000S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-
	Waterfowl	Canvasback	Wintering				1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering				1,000S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				1,000S													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				1,000S													-	-	-	-
	Waterfowl	Mergansers	Wintering				100S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
	Waterfowl	Redhead	Wintering			1,000S													-	-	-
	Waterfowl	Ring-necked duck	Wintering			Present													-	-	-
	Waterfowl	Ruddy duck	Wintering			10,000S													-	-	-
	Waterfowl	Scaup	Wintering			100S													-	-	-
	Waterfowl	Scoters	Wintering			1,000S													-	-	-
1167	Diving	Common loon	Wintering			Present													-	-	-
	Diving	Grebes	Wintering			10S													-	-	-
	Diving	Red-throated loon	Wintering			100S													-	-	-
	Pelagic	Northern gannet	Wintering			Present													-	-	-
	Waterfowl	American black duck	Wintering			1,000S													-	-	-
	Waterfowl	Blue-winged teal	Migration			10S													-	Feb-Apr	Aug-Oct
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-
	Waterfowl	Canvasback	Wintering			100S													-	-	-
	Waterfowl	Green-winged teal	Wintering			10S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			100S													-	-	-
	Waterfowl	Mallard	Wintering			1,000S													-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-
	Waterfowl	Redhead	Wintering			1,000S													-	-	-
	Waterfowl	Ruddy duck	Wintering			100S													-	-	-
	Waterfowl	Scoters	Wintering			1,000S													-	-	-
1168	Diving	Common loon	Wintering			Present													-	-	-
	Diving	Grebes	Wintering			10S													-	-	-
	Diving	Red-throated loon	Wintering			100S													-	-	-
	Pelagic	Northern gannet	Wintering			Present													-	-	-
	Waterfowl	Blue-winged teal	Migration			10S													-	Feb-Apr	Aug-Oct
	Waterfowl	Green-winged teal	Wintering			10S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			100S													-	-	-
	Waterfowl	Redhead	Wintering			1,000S													-	-	-
	Waterfowl	Scoters	Wintering			1,000S													-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1557	Diadromous	Alewife	Migration			-													-	-	Aug-Nov	Feb-Apr
	Diadromous	American shad	Migration			-													-	-	Aug-Nov	Feb-Jun
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec
	Diadromous	Blueback herring	Migration			-													-	-	Aug-Nov	Mar-Jun
	Diadromous	Hickory shad	Migration			-													-	-	Jun-Sep	Feb-May
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	Jan-Dec	Jan-Dec
	Diadromous	Striped bass	Migration			-													-	-	-	Feb-Jun
1563	Diadromous	Alewife	Migration			-													-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec
	Diadromous	Blueback herring	Migration			-													-	-	Aug-Nov	Mar-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-	Jan-Dec	Jan-Dec

FISH (continued)

Map ID	Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults					
				S	F		J	F	M	A	M	J	J	A	S	O	N	D									
1575	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-							Jan-Dec
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-													-	-							Jan-Dec
1620	Diadromous	Alewife	Migration			-													-	-							Feb-Apr
	Diadromous	Blueback herring	Migration			-													-	-							Mar-Jun
1627	Diadromous	American shad	Migration			-													-	-							Feb-Jun
	Diadromous	Hickory shad	Migration			-													-	-							Feb-May
Diadromous	Striped bass	Migration			-														-	-							Feb-Jun

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MDVA		Monthly Presence												Hatch	Internest	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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INVERTEBRATES

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





MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MDVA		Monthly Presence												Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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1844	Manatee	West Indian manatee	General Distribution	-/E	E	Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																</


BIRDS

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

FISH

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





FISH (continued)

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


REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

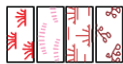
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	356.27	0.56
10B	Freshwater Marshes	1,580.44	2.47
10C	Swamps	3,998.35	6.25
10D	Scrub and Shrub Wetlands	1,406.11	2.20



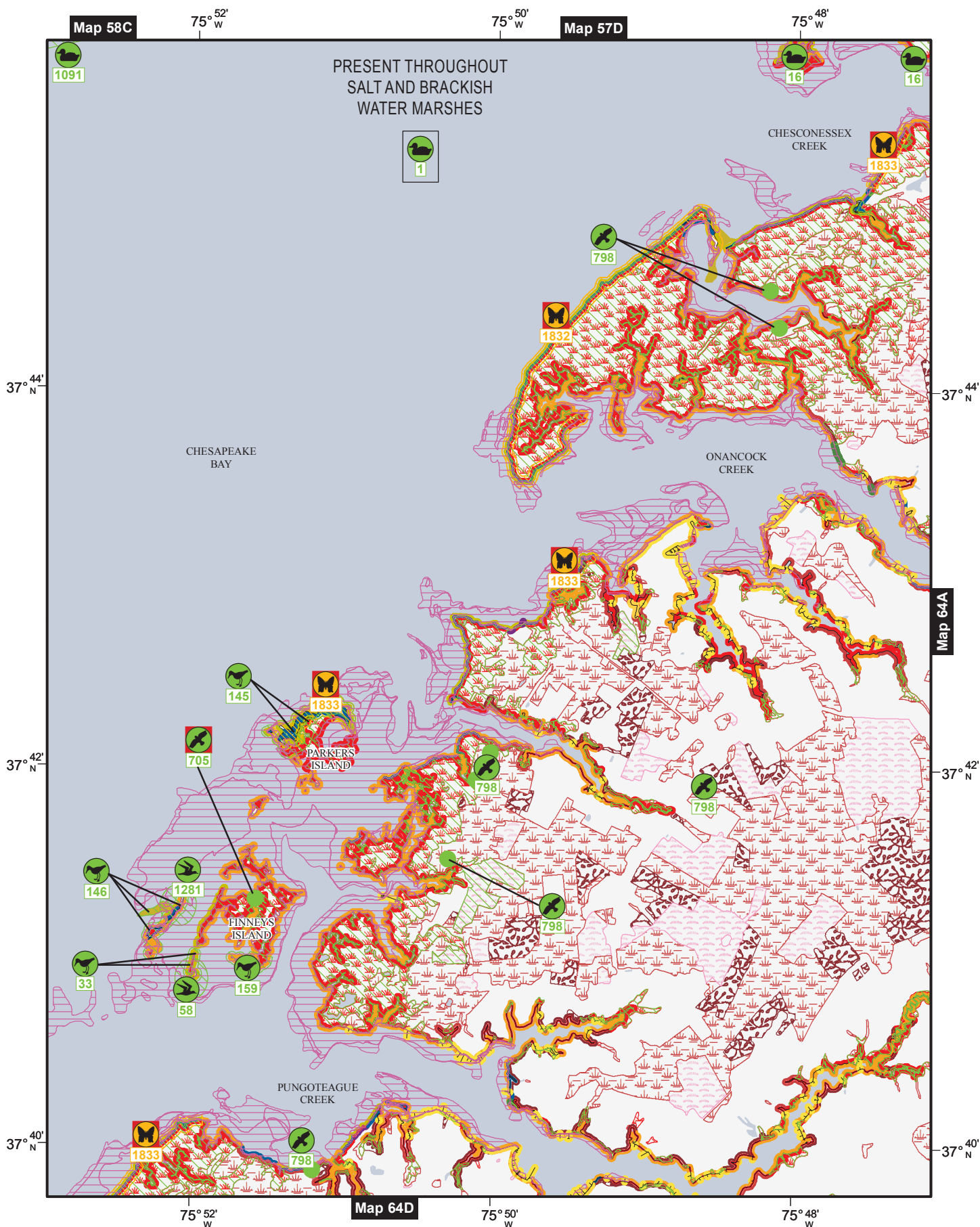
ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	49,715.02	30.89	42%
10C	Swamps	18,761.32	11.66	16%
10D	Scrub and Shrub Wetlands	3,112.70	1.93	3%
9A	Sheltered Tidal Flats	22,621.23	14.06	19%
9B	Vegetated Low Banks	12,969.19	8.06	11%
8B	Sheltered, Solid Man-Made Structures	10,083.32	6.27	8%
8C	Sheltered Riprap	1,106.59	0.69	1%
3A	Fine to Medium Grained Sand Beaches	798.98	0.50	1%
Total ESI Shoreline:		119,168.35	74.05	
Total Shoreline:		60,410.18	37.54	

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

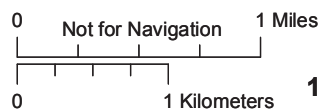




Map 64B
Delmarva Peninsula



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



Map 64B
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS




Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence											
								J	F	M	A	M	J	J	A	S	O	N	D
1	Waterfowl	American black duck	Nesting				Present												
	Waterfowl	Canada goose	Nesting				Present												
	Waterfowl	Mallard	Nesting				Present												
16	Waterfowl	American black duck	Nesting				Present												
	Waterfowl	American black duck	Wintering				100S												
	Waterfowl	Canada goose	Nesting				Present												
	Waterfowl	Mallard	Nesting				Present												
	Waterfowl	Mallard	Wintering				100S												
	Waterfowl	Northern pintail	Wintering				10S												
33	Waterfowl	Snow goose	Wintering				100S												
	Shorebird	American oystercatcher	Nesting				1 Pair												
	Gull/Tern	Forster's tern	Nesting				10 Pairs												
145	Shorebird	American oystercatcher	Nesting				12 Pairs												
	Shorebird	American oystercatcher	Roosting				1 Pair												
	Shorebird	American oystercatcher	Nesting				6 Pairs												
146	Shorebird	American oystercatcher	Roosting				1 Pair												
	Shorebird	American oystercatcher	Nesting				2 Pairs												
	Shorebird	American oystercatcher	Nesting				-/T												
705	Raptor	Peregrine falcon	Nesting				-												
	Raptor	Bald eagle	Nesting				1 Nest												
	Waterfowl	Canvasback	Wintering				1,000S												
1091	Waterfowl	Redhead	Wintering				10,000S												
	Waterfowl	Ring-necked duck	Wintering				Present												
	Waterfowl	Ruddy duck	Wintering				10,000S												
1281	Waterfowl	Scaup	Wintering				1,000S												
	Gull/Tern	G. black-backed gull	Nesting				1 Pair												

INVERTEBRATES



Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence											
								J	F	M	A	M	J	J	A	S	O	N	D
1832	Insect	NE beach tiger beetle	Concentration Area				High												
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence				-												

Delmarva Peninsula: Map 64B


BIRDS

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

FISH

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



REPTILES & AMPHIBIANS

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

INVERTEBRATES





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

MARINE MAMMALS



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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

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

Delmarva Peninsula: Map 64B

FISH (continued)

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


REPTILES & AMPHIBIANS

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


INVERTEBRATES

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

INVERTEBRATES (continued)

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	2,129.29	3.33
10B	Freshwater Marshes	692.19	1.08
10C	Swamps	2,389.65	3.73
10D	Scrub and Shrub Wetlands	487.86	0.76
9A	Sheltered Tidal Flats	15.13	0.02
7	Exposed Tidal Flats	33.21	0.05

ESI SHORELINE HABITAT TYPES

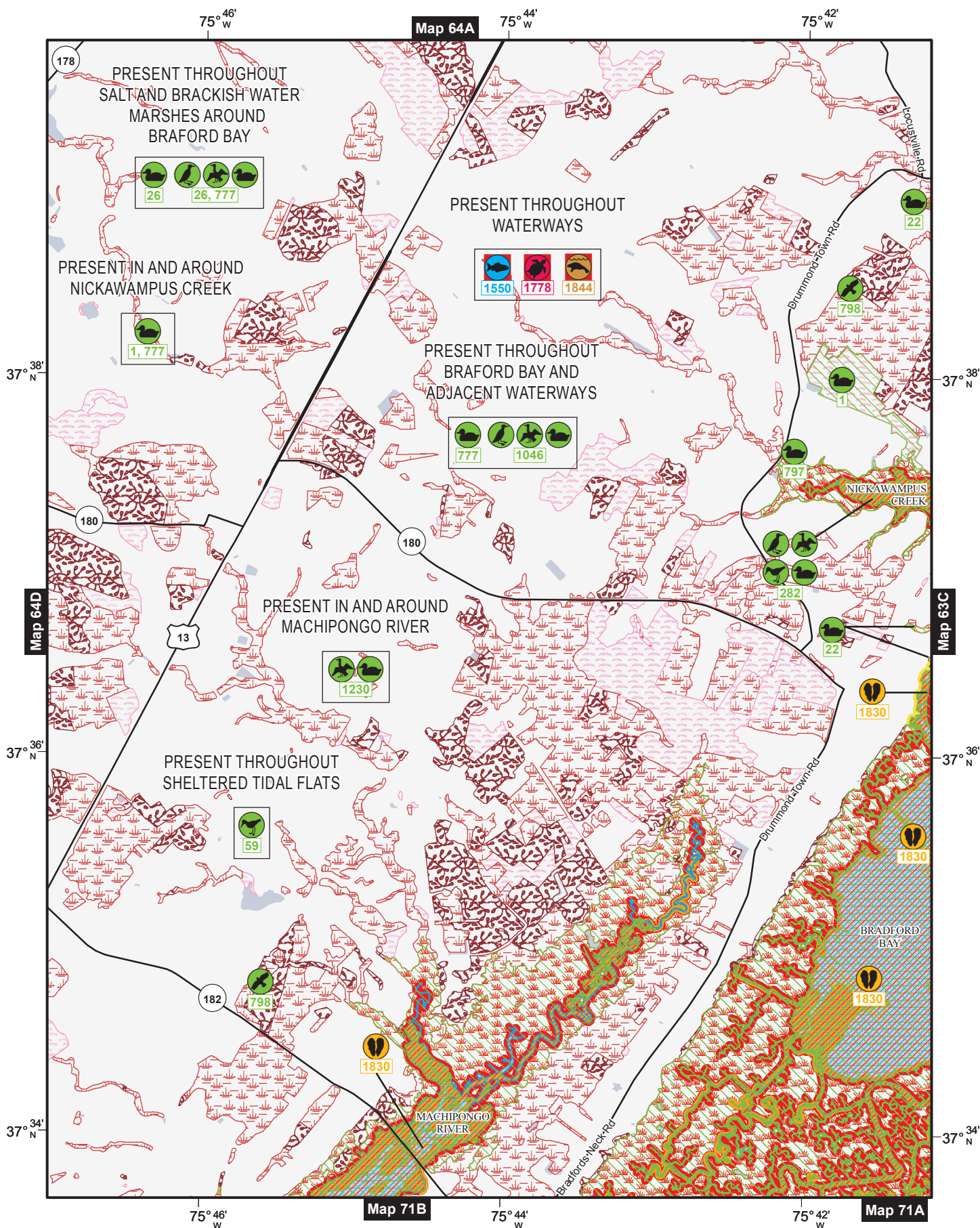
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	166,454.58	103.43	41%
10B	Freshwater Marshes	51.73	0.03	< 1%
10C	Swamps	15,929.42	9.90	4%
10D	Scrub and Shrub Wetlands	16,117.53	10.01	4%
9A	Sheltered Tidal Flats	138,251.90	85.91	34%
9B	Vegetated Low Banks	13,445.38	8.35	3%
8B	Sheltered, Solid Man-Made Structures	9,476.84	5.89	2%
8C	Sheltered Riprap	1,760.96	1.09	< 1%
7	Exposed Tidal Flats	19,874.25	12.35	5%
6B	Riprap	478.64	0.30	< 1%
3A	Fine to Medium Grained Sand Beaches	22,023.80	13.68	5%
1B	Exposed, Solid Man-Made Structures	404.38	0.25	< 1%

Total ESI Shoreline: 404,269.42 Total ESI Shoreline: 251.20
Total Shoreline: 183,531.66 Total Shoreline: 114.04

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 64C
Delmarva Peninsula



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

0 Not for Navigation 1 Miles
0 1 Kilometers

1:50,000



Map 64C
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
							J	F	M	A	M	J	J	A	S	O	N	D				
1	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-
22	Waterfowl	American wigeon	Wintering			100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering			10,000S													-	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Northern pintail	Wintering			100S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering			10S													-	-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-	-
26	Waterfowl	Tundra swan	Wintering			10S													-	-	-	-
	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering			10,000S													-	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													-	-	-	-
	Waterfowl	Shorebirds	Migration			Potential													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Common loon	Wintering			10S													-	May-Jun	Aug-Oct	-
59	Shorebird	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
282	Diving	Grebes	Wintering			10S													-	-	-	-
	Diving	Red-throated loon	Wintering			100S													-	-	-	-
	Pelagic	Northern gannet	Wintering			10S													-	-	-	-
	Shorebird	Shorebirds	Migration			High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2													-	May-Jun	-	-
	Waterfowl	Blue-winged teal	Migration			1,000S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering			1,000S													-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-
	Waterfowl	Scoters	Wintering			1,000S													-	-	-
777	Waterfowl	American black duck	Wintering			1,000S													-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-
	Waterfowl	Northern pintail	Wintering			100S													-	-	-
	Waterfowl	Northern shoveler	Wintering			10S													-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-
	Waterfowl	Tundra swan	Wintering			10S													-	-	-
797	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct
	Waterfowl	Brant	Wintering			10,000S													-	-	-
	Waterfowl	Gadwall	Wintering			100S													-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest													Dec-Jun	-	-
1046	Diving	Common loon	Wintering			10S													-	-	-
	Diving	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov
	Diving	Grebes	Wintering			10S													-	-	-
	Diving	Red-throated loon	Wintering			100S													-	-	-
	Pelagic	Northern gannet	Wintering			10S													-	-	-
	Waterfowl	Blue-winged teal	Migration			1,000S													-	Feb-Apr	Aug-Oct
	Waterfowl	Brant	Wintering			1,000S													-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-
	Waterfowl	Scoters	Wintering			1,000S													-	-	-
1230	Diving	Common loon	Wintering			Present													-	-	-
	Diving	Grebes	Wintering			Present													-	-	-
	Diving	Red-throated loon	Wintering			Present													-	-	-
	Waterfowl	American black duck	Wintering			100S													-	-	-
	Waterfowl	Brant	Wintering			10S													-	-	-
	Waterfowl	Bufflehead	Wintering			100S													-	-	-
	Waterfowl	Mergansers	Wintering			10S													-	-	-
	Waterfowl	Tundra swan	Wintering			Present													-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1550	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	Jan-Dec
	Marine Pelagic	Sandbar shark	Nursery Area			-													-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1778	Turtle	Green sea turtle	General Distribution	T/T	T	Rare													-	-	-	Jul-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Rare													-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common													-	-	-	May-Nov	May-Nov

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1830	Bivalve	Eastern oyster	Harvest Area			-													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec

MARINE MAMMALS

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Waterfowl	Canada goose	Wintering			1,000S													-	-	-	-	-
		Mallard	Wintering			100S													-	-	-	-	-






ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH







Monthly Presence

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	Alewife													-	-	-	Apr-May	Mar-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	Aug-Nov	Apr-Jun
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Blueback herring													-	-	-	Apr-Oct	Apr-Jun
	Hickory shad													-	-	-	Feb-Sep	Feb-Sep
	Striped bass													-	-	-	May-Oct	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	Feb-Jun	Feb-Jun
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Black drum													-	-	-	May-Oct	Jan-Dec
	Black sea bass													-	-	-	Apr-Dec	Apr-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Cleannose skate													-	-	-	Jan-Dec	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jan-Dec	Jan-Dec
	Crevalle jack													-	-	-	May-Oct	-
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

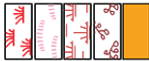
MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	2,201.06	3.44
10B	Freshwater Marshes	1,233.73	1.93
10C	Swamps	4,044.18	6.32
10D	Scrub and Shrub Wetlands	1,516.60	2.37
9A	Sheltered Tidal Flats	315.04	0.49



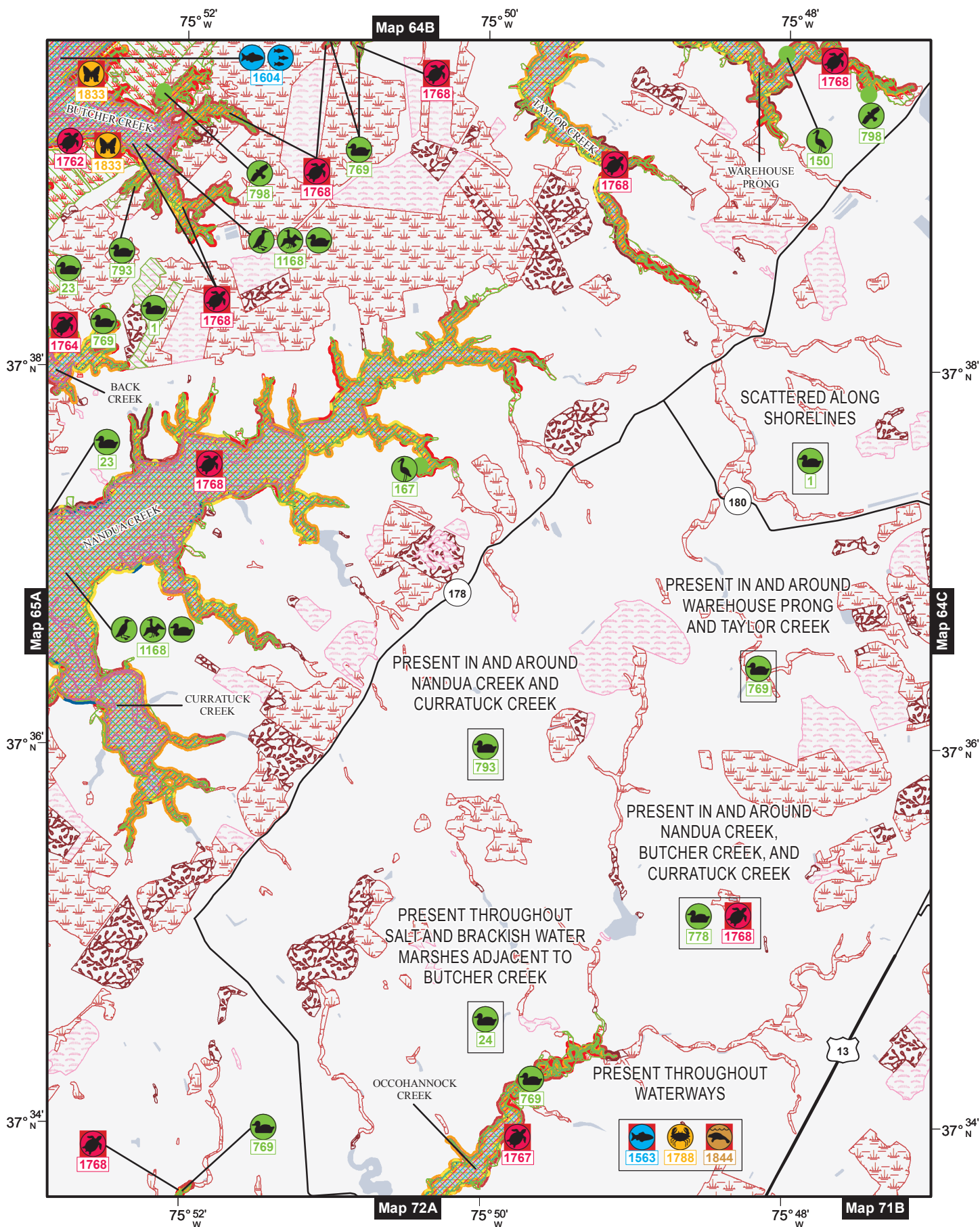
ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	128,887.44	80.09	49%
10C	Swamps	85.15	0.05	< 1%
10D	Scrub and Shrub Wetlands	141.03	0.09	< 1%
9A	Sheltered Tidal Flats	129,980.46	80.77	50%
9B	Vegetated Low Banks	280.72	0.17	< 1%
8B	Sheltered, Solid Man-Made Structures	1,171.91	0.73	< 1%
8C	Sheltered Riprap	740.41	0.46	< 1%
Total ESI Shoreline:		261,287.13	Total ESI Shoreline:	162.36
		129,980.46	Total Shoreline:	80.77

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

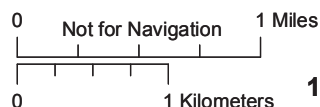




Map 64D Delmarva Peninsula



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



1:50,000



Map 64D
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
1	Waterfowl	American black duck	Nesting		Present												
	Waterfowl	Canada goose	Nesting		Present												
	Waterfowl	Mallard	Nesting		Present												
	Waterfowl	American black duck	Nesting		Present												
	Waterfowl	American black duck	Wintering		1,000S												
23	Waterfowl	American wigeon	Wintering		100S												
	Waterfowl	Blue-winged teal	Migration		100S												
	Waterfowl	Brant	Wintering		10S												
	Waterfowl	Bufflehead	Wintering		1,000S												
	Waterfowl	Canada goose	Nesting		Present												
	Waterfowl	Canada goose	Wintering		1,000S												
	Waterfowl	Canvasback	Wintering		100S												
	Waterfowl	Gadwall	Wintering		100S												
	Waterfowl	Green-winged teal	Wintering		100S												
	Waterfowl	Mallard	Nesting		Present												
24	Waterfowl	Mallard	Wintering		1,000S												
	Waterfowl	Mergansers	Wintering		100S												
	Waterfowl	Northern shoveler	Wintering		Present												
	Waterfowl	Redhead	Wintering		100S												
	Waterfowl	Ring-necked duck	Wintering		10S												
	Waterfowl	Ruddy duck	Wintering		100S												
	Waterfowl	Scaup	Wintering		10S												
	Waterfowl	Tundra swan	Wintering		100S												
	Waterfowl	American black duck	Nesting		Present												
	Waterfowl	Blue-winged teal	Migration		100S												
	Waterfowl	Canada goose	Nesting		Present												
	Waterfowl	Green-winged teal	Wintering		100S												
	Waterfowl	Mallard	Nesting		Present												
	Waterfowl	Redhead	Wintering		100S												
	Waterfowl	Ring-necked duck	Wintering		10S												

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Waterfowl	Scaup	Wintering			10S												-	-	-	-
150	Wading	Great blue heron	Nesting			10 Nests												Feb-Jun	-	-	-
167	Wading	Great blue heron	Nesting			8 Nests												Feb-Jun	-	-	-
769	Waterfowl	American black duck	Wintering			1,000S												-	-	-	-
	Waterfowl	American wigeon	Wintering			100S												-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S												-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering			10S												-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S												-	-	-	-
	Waterfowl	Canvasback	Wintering			100S												-	-	-	-
	Waterfowl	Gadwall	Wintering			100S												-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S												-	-	-	-
	Waterfowl	Mallard	Wintering			1,000S												-	-	-	-
	Waterfowl	Mergansers	Wintering			100S												-	-	-	-
	Waterfowl	Northern shoveler	Wintering			Present												-	-	-	-
	Waterfowl	Redhead	Wintering			100S												-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S												-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S												-	-	-	-
	Waterfowl	Scaup	Wintering			10S												-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S												-	-	-	-
778	Waterfowl	American black duck	Wintering			1,000S												-	-	-	-
	Waterfowl	American wigeon	Wintering			100S												-	-	-	-
	Waterfowl	Brant	Wintering			10S												-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-	-
	Waterfowl	Canada goose	Wintering			1,000S												-	-	-	-
	Waterfowl	Canvasback	Wintering			100S												-	-	-	-
	Waterfowl	Gadwall	Wintering			100S												-	-	-	-
	Waterfowl	Mallard	Wintering			1,000S												-	-	-	-
	Waterfowl	Mergansers	Wintering			100S												-	-	-	-
	Waterfowl	Northern shoveler	Wintering			Present												-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S												-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S												-	-	-	-
793	Waterfowl	Blue-winged teal	Migration			100S												-	Feb-Apr	Aug-Oct	-
	Waterfowl	Green-winged teal	Wintering			100S												-	-	-	-
	Waterfowl	Redhead	Wintering			100S												-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S												-	-	-	-
	Waterfowl	Scaup	Wintering			10S												-	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-
1168	Diving	Common loon	Wintering			Present												-	-	-	-
	Diving	Grebes	Wintering			10S												-	-	-	-
	Diving	Red-throated loon	Wintering			100S												-	-	-	-
	Pelagic	Northern gannet	Wintering			Present												-	-	-	-
	Waterfowl	Blue-winged teal	Migration			10S												-	Feb-Apr	Aug-Oct	-
	Waterfowl	Green-winged teal	Wintering			10S												-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
	Waterfowl	Long-tailed duck	Wintering			100S												-	-	-	-	-
	Waterfowl	Redhead	Wintering			1,000S												-	-	-	-	-
	Waterfowl	Scoters	Wintering			1,000S												-	-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1563	Diadromous	Alewife	Migration			-											-	-	-	Feb-Apr			
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-											-	-	-	Jan-Dec			
	Diadromous	Blueback herring	Migration			-											-	-	-	Mar-Jun			
1604	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-											-	-	-	Jan-Dec			
	Diadromous	American shad	Migration			-											-	-	-	Aug-Nov			
	Diadromous	Hickory shad	Migration			-											-	-	-	Jun-Sep			
	Diadromous	Striped bass	Migration			-											-	-	-	Feb-Jun			
Estuarine Nursery	Atl. sharpnose shark	Nursery Area			-												-	-	-	Jun-Sep			
Marine Pelagic	Sandbar shark	Nursery Area			-												-	-	-	May-Sep			

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1762	Turtle	Diamondback terrapin	Concentration Area			High												May-Aug	-	-	Apr-Oct	Apr-Oct	
	Turtle	Diamondback terrapin	Concentration Area			High												May-Aug	-	-	Apr-Oct	Apr-Oct	
1764	Turtle	Green sea turtle	General Distribution	T/T	T	Common												-	-	-	Jul-Oct	-	
	Turtle	Green sea turtle	General Distribution	T/T	T	Rare												-	-	-	May-Dec*	-	
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-	
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-	
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec	
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct	
1767	Turtle	Green sea turtle	General Distribution	T/T	T	Rare												-	-	-	May-Dec*	-	
	Turtle	Green sea turtle	General Distribution	T/T	T	Common												-	-	-	Jul-Oct	-	
1768	Turtle	Green sea turtle	General Distribution	T/T	T	Rare												-	-	-	May-Dec*	-	
	Turtle	Green sea turtle	General Distribution	T/T	T	Common												-	-	-	Jul-Oct	-	
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-	
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-	
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec	
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct	

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults				
				S	F		J	F	M	A	M	J	J	A	S	O	N										
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ												-	-	-	-	-	-	-	-	-	-
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-												Jun-Aug	Jun-Aug	Jan-Dec	-	-	-	-	-	-	-

MARINE MAMMALS






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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS


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

FISH

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

Delmarva Peninsula: Map 64D





FISH (continued)

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


REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

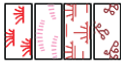
Subelement	Species	Monthly Presence												Mating	Calving	Pupping	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Bottlenose dolphin													-	-	-	-
	Bottlenose dolphin													May-Aug	May-Aug	-	-
	Harbor porpoise													-	-	-	-

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	496.56	0.78
10B	Freshwater Marshes	1,162.03	1.82
10C	Swamps	3,276.07	5.12
10D	Scrub and Shrub Wetlands	821.54	1.28



ESI SHORELINE HABITAT TYPES

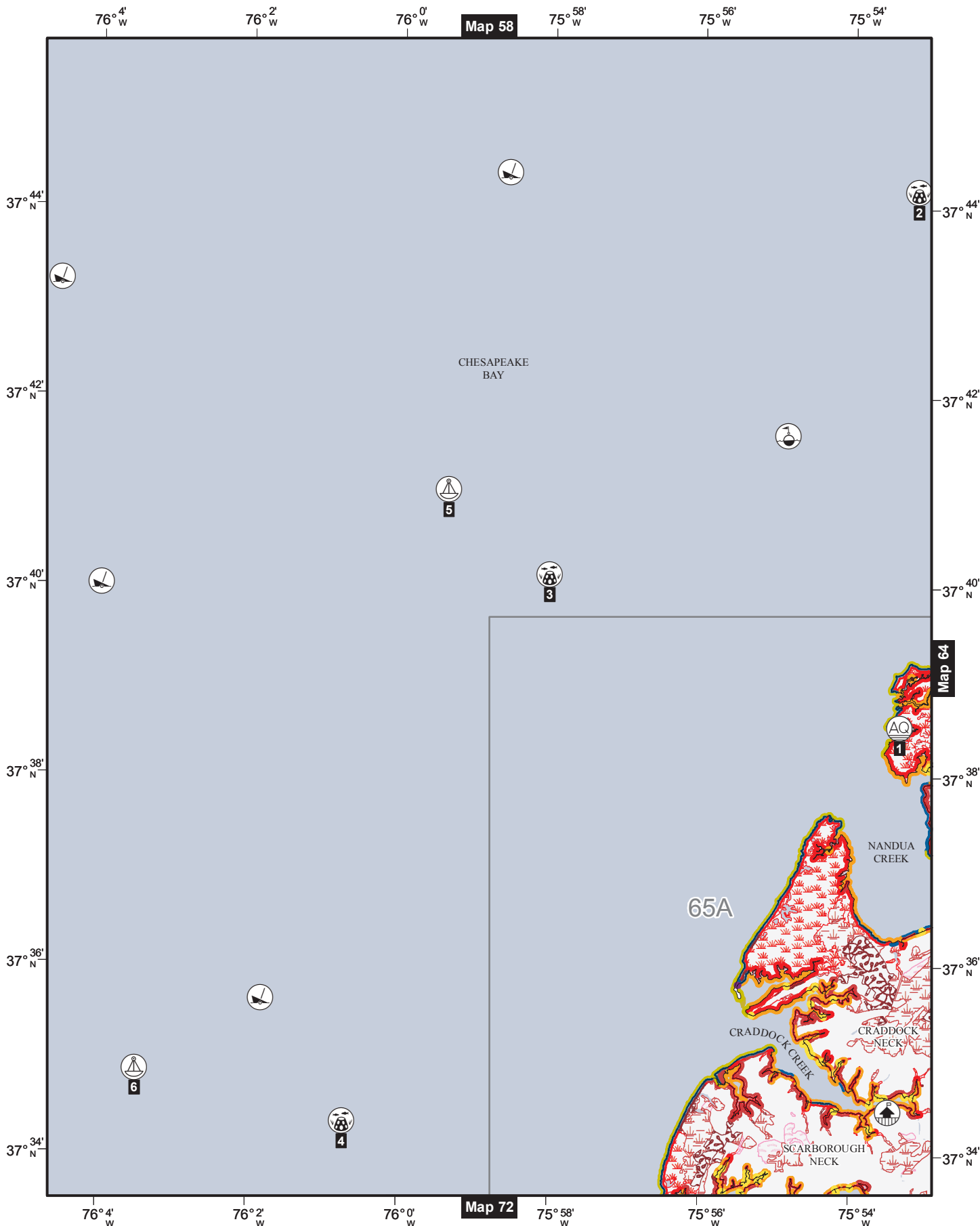
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	93,990.37	58.40	36%
10B	Freshwater Marshes	43.44	0.03	< 1%
10C	Swamps	22,584.42	14.03	9%
10D	Scrub and Shrub Wetlands	7,693.51	4.78	3%
9A	Sheltered Tidal Flats	93,970.16	58.39	36%
9B	Vegetated Low Banks	34,266.09	21.29	13%
8B	Sheltered, Solid Man-Made Structures	5,725.19	3.56	2%
8C	Sheltered Riprap	849.11	0.53	< 1%
7	Exposed Tidal Flats	1,739.32	1.08	1%
3A	Fine to Medium Grained Sand Beaches	3,514.20	2.18	1%

Total ESI Shoreline: 264,375.81 Total ESI Shoreline: 164.28
Total Shoreline: 101,159.93 Total Shoreline: 62.86

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 65
Delmarva Peninsula



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

0 2 Miles
Not for Navigation
0 2 Kilometers

1:100,000



Map 65
Delmarva Peninsula

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	AQUACULTURE	OYSTER NON-COMM HEINRICH'S RF#01-1464	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
2	ARTIFICIAL REEF	ANGLERS		
3	ARTIFICIAL REEF	NANDUA-PUNGOTEAGUE		
4	ARTIFICIAL REEF	OCCOHANNOCK		
5	REPEATED MEASUREMENT SITE	WQ - STATION CB7.1	CHESAPEAKE BAY PROGRAM	800-968-7229
6	REPEATED MEASUREMENT SITE	WQ - STATION CB7.1S	CHESAPEAKE BAY PROGRAM	800-968-7229
ALSO PRESENT IN MAPPED AREA (POLYGONS)				
Type	Name		Contact	Phone
STATE PROTECTED AREA	BLUE CRAB SANCTUARY		VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200

JURISDICTIONS		
COUNTY:	ACCOMACK COUNTY	
COAST GUARD:	DISTRICT 5, SECTOR HAMPTON ROADS	
USACE:	NORTH ATLANTIC DIVISION, NORFOLK DISTRICT	
FEMA:	REGION 1	
EPA:	REGION 3	

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,345.57	2.10
10B	Freshwater Marshes	122.29	0.19
10C	Swamps	948.63	1.48
10D	Scrub and Shrub Wetlands	299.27	0.47
7	Exposed Tidal Flats	6.21	0.01

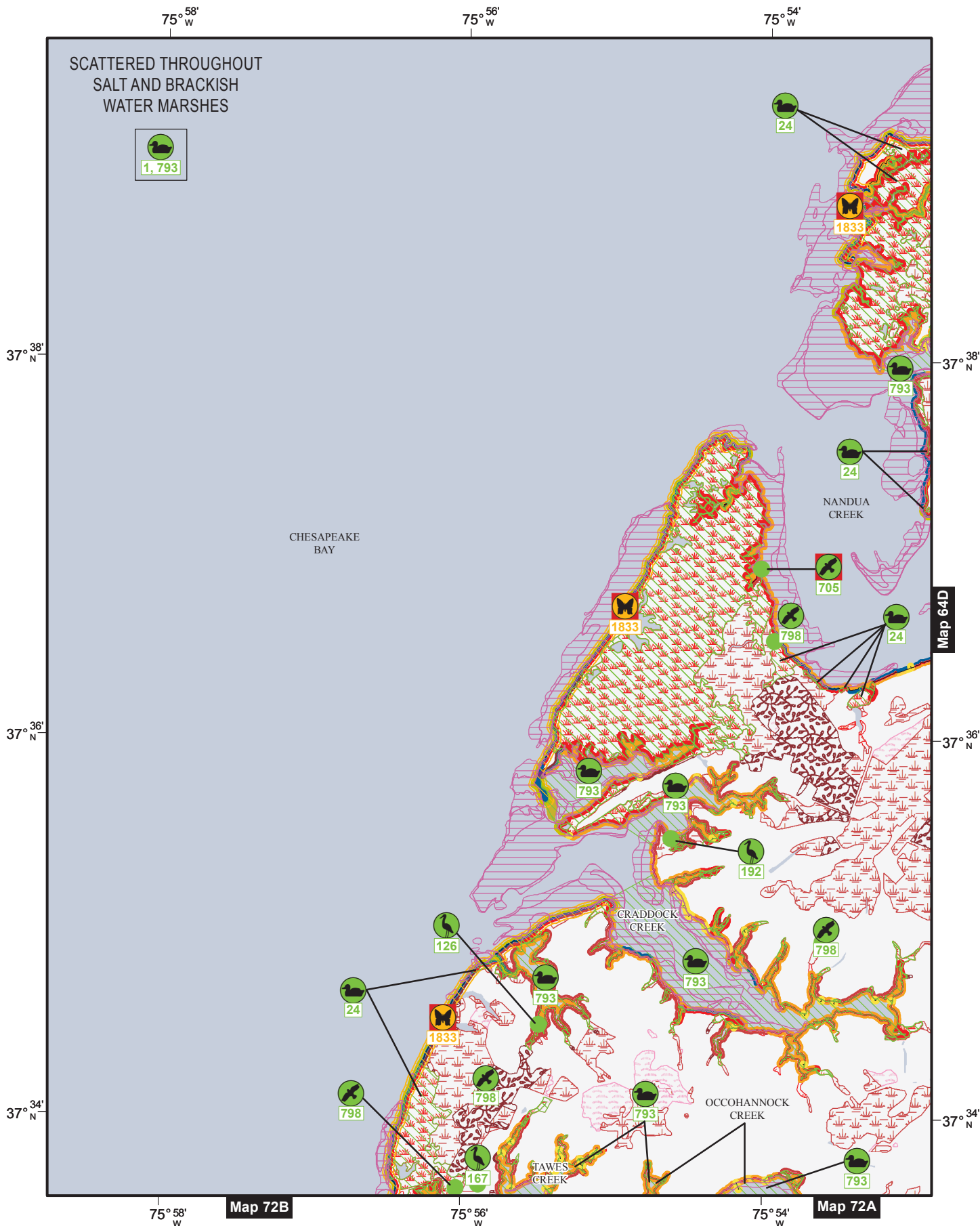
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	77,238.11	47.99	36%
10C	Swamps	19,647.85	12.21	9%
10D	Scrub and Shrub Wetlands	2,694.40	1.67	1%
9A	Sheltered Tidal Flats	64,036.65	39.79	30%
9B	Vegetated Low Banks	16,029.05	9.96	7%
8B	Sheltered, Solid Man-Made Structures	1,581.64	0.98	1%
8C	Sheltered Riprap	331.73	0.21	< 1%
7	Exposed Tidal Flats	14,700.73	9.13	7%
3A	Fine to Medium Grained Sand Beaches	18,443.92	11.46	9%
1B	Exposed, Solid Man-Made Structures	7.12	0.00	< 1%
Total ESI Shoreline:		214,711.20	133.42	
Total Shoreline:		83,081.81	51.62	

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 65A
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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




BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
1	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug
24	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S												-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul
	Waterfowl	Green-winged teal	Wintering			100S												-	-	-	-
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug
	Waterfowl	Redhead	Wintering			100S												-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S												-	-	-	-
	Waterfowl	Scaup	Wintering			10S												-	-	-	-
126	Wading	Great blue heron	Nesting			3 Nests												Feb-Jun	-	-	-
167	Wading	Great blue heron	Nesting			8 Nests												Feb-Jun	-	-	-
192	Wading	Great blue heron	Nesting			19 Nests												Feb-Jun	-	-	-
705	Raptor	Peregrine falcon	Nesting			-												Feb-Jun	-	-	-
793	Waterfowl	Blue-winged teal	Migration			100S												-	Feb-Apr	Aug-Oct	-
	Waterfowl	Green-winged teal	Wintering			100S												-	-	-	-
	Waterfowl	Redhead	Wintering			100S												-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S												-	-	-	-
	Waterfowl	Scaup	Wintering			10S												-	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-




INVERTEBRATES

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


BIRDS

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

FISH

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



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS



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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Monthly Presence																Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D								
	Brown pelican																-	-	-		
	D. crested cormorant																-	-	-		
	Gulls																-	-	-		
	Terns																-	-	-		
	Wood duck															Apr-Jul	-	-	Jul-Aug		

FISH

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

Delmarva Peninsula: Map 65A

FISH (continued)

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



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

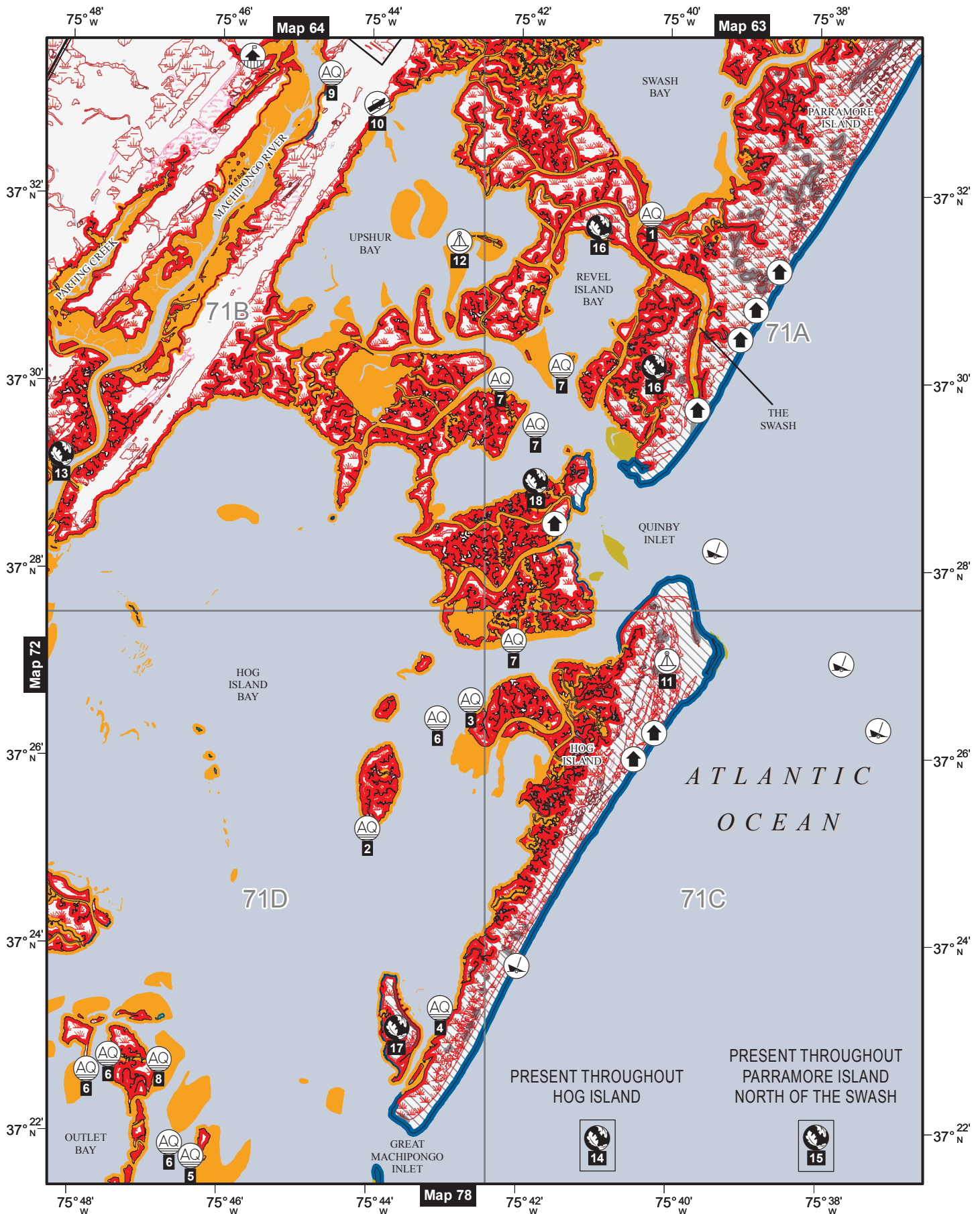
ESI POLYGON HABITAT TYPES			
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,345.57	2.10
10B	Freshwater Marshes	122.29	0.19
10C	Swamps	948.63	1.48
10D	Scrub and Shrub Wetlands	299.27	0.47
7	Exposed Tidal Flats	6.21	0.01

ESI SHORELINE HABITAT TYPES			
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)
10A	Salt and Brackish Water Marshes	77,238.11	47.99
10C	Swamps	19,647.85	12.21
10D	Scrub and Shrub Wetlands	2,694.40	1.67
9A	Sheltered Tidal Flats	64,036.65	39.79
9B	Vegetated Low Banks	16,029.05	9.96
8B	Sheltered, Solid Man-Made Structures	1,581.64	0.98
8C	Sheltered Riprap	331.73	0.21
7	Exposed Tidal Flats	14,700.73	9.13
3A	Fine to Medium Grained Sand Beaches	18,443.92	11.46
1B	Exposed, Solid Man-Made Structures	7.12	0.00
Total ESI Shoreline:		214,711.20	Total ESI Shoreline: 133.42
Total Shoreline:		83,081.81	Total Shoreline: 51.62

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

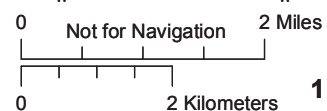




Map 71
Delmarva Peninsula



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



Map 71
Delmarva Peninsula

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	AQUACULTURE	HARD CLAMS BLANCHARD RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
2	AQUACULTURE	HARD CLAMS BOWEN RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
3	AQUACULTURE	HARD CLAMS HARRIS-RIGGAN RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
4	AQUACULTURE	HARD CLAMS KELLY RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	AQUACULTURE	HARD CLAMS SMITH RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
6	AQUACULTURE	HARD CLAMS TERRY RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
7	AQUACULTURE	HARD CLAMS WALKER BROTHERS RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
8	AQUACULTURE	HARD CLAMS WEBB RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
9	AQUACULTURE	OYSTER NON-COMM GLEIM RF#99-1457	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
10	BOAT RAMP	QUINBY	VIRGINIA DEPT. OF GAME AND INLAND FISHERIES	804-367-1000
11	REPEATED MEASUREMENT SITE	LTER VCR HOG ISLAND DUNE METEOROLOGICAL ST	LONG TERM ECOL. RESEARCH NETWORK OFFICE	505-277-2597
12	REPEATED MEASUREMENT SITE	MWS - SITE QUIUB	GREG PINIAK, PROJECT MANAGER	301-713-3028

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
13	NATURE CONSERVANCY	GREENS CREEK	THE NATURE CONSERVANCY	703-841-5300
14	NATURE CONSERVANCY	HOG ISLAND	THE NATURE CONSERVANCY	703-841-5300
15	NATURE CONSERVANCY	PARRAMORE ISLAND	THE NATURE CONSERVANCY	703-841-5300
16	NATURE CONSERVANCY	REVEL ISLAND	THE NATURE CONSERVANCY	703-841-5300
17	NATURE CONSERVANCY	ROGUE ISLAND	THE NATURE CONSERVANCY	703-841-5300
18	NATURE CONSERVANCY	SANDY ISLAND FEE	THE NATURE CONSERVANCY	703-841-5300

ALSO PRESENT IN MAPPED AREA (POLYGONS)			
Type	Name	Contact	Phone
STATE PROTECTED AREA	TIDAL LANDS	VA MARINE RESOURCES COMMISSION	

JURISDICTIONS				
COUNTY:	ACCOMACK COUNTY, NORTHAMPTON COUNTY	FEMA:	REGION 1	
COAST GUARD:	DISTRICT 5, SECTOR HAMPTON ROADS	EPA:	REGION 3	
USACE:	NORTH ATLANTIC DIVISION, NORFOLK DISTRICT			

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	16,152.79	25.24
10B	Freshwater Marshes	264.69	0.41
10C	Swamps	1,012.66	1.58
10D	Scrub and Shrub Wetlands	450.62	0.70
9A	Sheltered Tidal Flats	4,041.72	6.32
7	Exposed Tidal Flats	148.00	0.23

ESI SHORELINE HABITAT TYPES

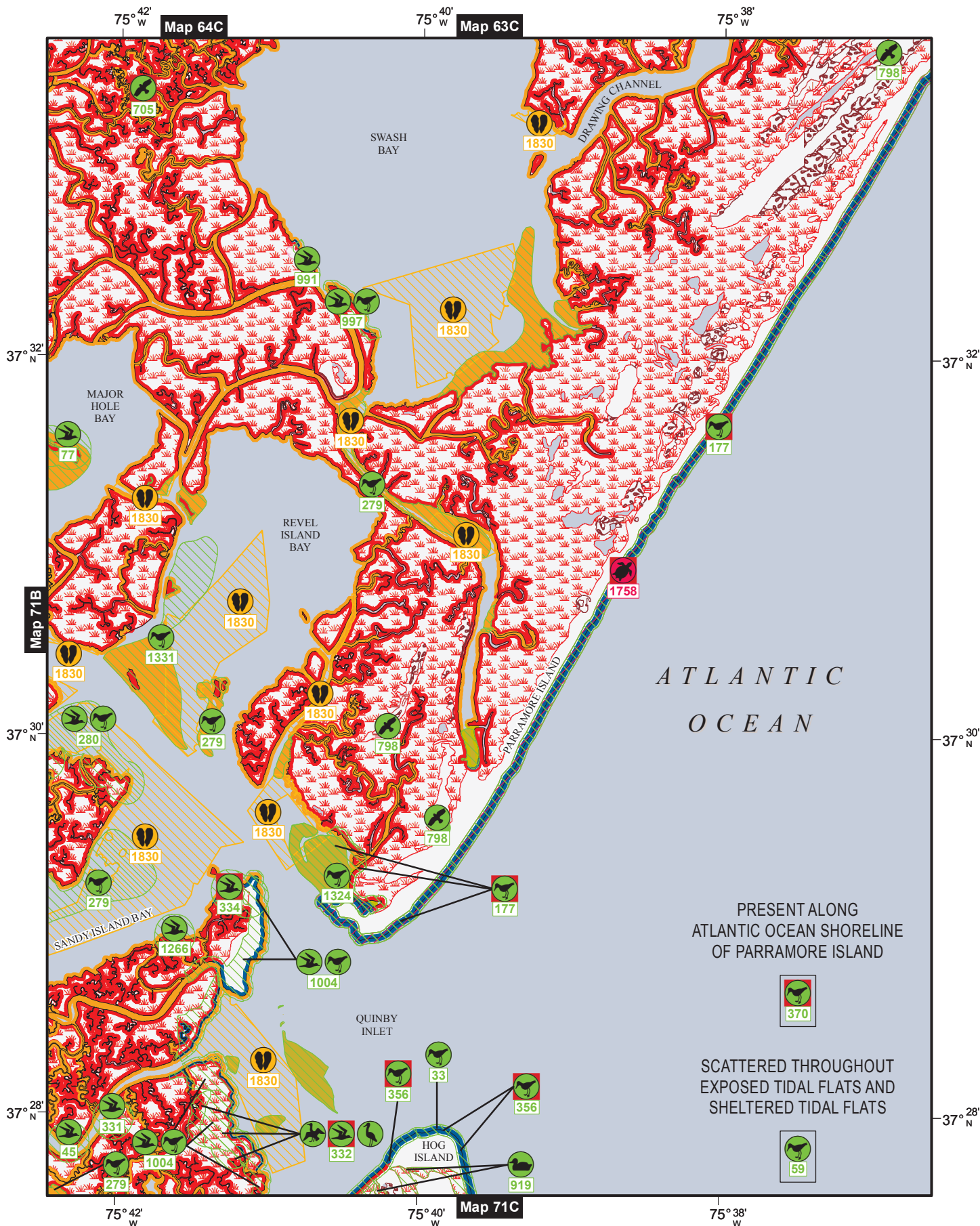
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	987,103.81	613.36	49%
10B	Freshwater Marshes	768.26	0.48	< 1%
10C	Swamps	1,372.30	0.85	< 1%
10D	Scrub and Shrub Wetlands	2,921.72	1.82	< 1%
9A	Sheltered Tidal Flats	986,117.91	612.75	48%
9B	Vegetated Low Banks	5,766.30	3.58	< 1%
8B	Sheltered, Solid Man-Made Structures	1,144.06	0.71	< 1%
8C	Sheltered Riprap	183.08	0.11	< 1%
7	Exposed Tidal Flats	1,995.42	1.24	< 1%
5	Mixed Sand and Gravel Beaches	2,291.00	1.42	< 1%
3A	Fine to Medium Grained Sand Beaches	44,425.20	27.60	2%

Total ESI Shoreline: 2,034,089.06 Total ESI Shoreline: 1,263.92
 Total Shoreline: 1,020,653.49 Total Shoreline: 634.20

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 71A
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
							J	F	M	A	M	J	J	A	S	O	N	D				
33	Shorebird	American oystercatcher	Nesting			1 Pair													Apr-Aug	-	-	-
45	Gull/Tern	Forster's tern	Nesting			12 Pairs													May-Jul	-	-	-
59	Shorebird	Shorebirds	Migration			Potential													-	May-Jun	Aug-Oct	-
77	Gull/Tern	Forster's tern	Nesting			70 Pairs													May-Jul	-	-	-
	Gull/Tern	Laughing gull	Nesting			20 Pairs													Apr-Aug	-	-	-
177	Shorebird	American oystercatcher	Nesting			8 Pairs													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Roosting			4 Pairs													-	-	-	-
	Shorebird	Piping plover	Nesting	E/T	T	-													Apr-Aug	-	-	-
279	Shorebird	Shorebirds	Migration			High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2													-	May-Jun	-	-
280	Gull/Tern	Forster's tern	Nesting			32 Pairs													May-Jul	-	-	-
	Gull/Tern	Laughing gull	Nesting			8 Pairs													Apr-Aug	-	-	-
	Shorebird	Shorebirds	Migration			High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2													-	May-Jun	-	-
331	Gull/Tern	Forster's tern	Nesting			18 Pairs													May-Jul	-	-	-
332	Diving	Brown pelican	Nesting			201 Pairs													Apr-Aug	-	-	-
	Diving	D. crested cormorant	Nesting			17 Pairs													May-Aug	-	-	-
	Gull/Tern	Black skimmer	Nesting	E/-		4 Pairs													May-Sep	-	-	-
	Gull/Tern	Common tern	Nesting			12 Pairs													May-Aug	-	-	-
	Gull/Tern	G. black-backed gull	Nesting			55 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting			13 Pairs													May-Aug	-	-	-
	Wading	BC night-heron	Nesting			14 Pairs													Apr-Aug	-	-	-
	Wading	Glossy ibis	Nesting			12 Pairs													May-Jul	-	-	-
	Wading	Great egret	Nesting			57 Nests													Apr-Aug	-	-	-
	Wading	Snowy egret	Nesting			50 Pairs													Apr-Aug	-	-	-
	Wading	Tricolored heron	Nesting			21 Pairs													May-Aug	-	-	-
334	Gull/Tern	Black skimmer	Nesting	E/-		14 Pairs													May-Sep	-	-	-
	Gull/Tern	Common tern	Nesting			6 Pairs													May-Aug	-	-	-
	Gull/Tern	G. black-backed gull	Nesting			13 Pairs													Apr-Jun	-	-	-
	Gull/Tern	Herring gull	Nesting			4 Pairs													May-Aug	-	-	-
	Gull/Tern	Laughing gull	Nesting			420 Pairs													Apr-Aug	-	-	-
356	Shorebird	Black-bellied plover	Migration			100S													-	May-Jun	Sep-Dec	-
	Shorebird	Dunlin	Migration			1000S													-	Apr-May	Oct-Nov	-
	Shorebird	Red knot	Migration	T/T	T	Up To 185 Birds/Km													-	May-Jun	Jul-Oct	-
	Shorebird	Sanderling	Migration			100S													-	Apr-May	Aug-Oct	-
370	Shorebird	Dunlin	Migration			100S													-	Apr-May	Oct-Nov	-
	Shorebird	Red knot	Migration			Up To 107 Birds/Km													-	Apr-Jun	Jul-Oct	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Shorebird	Sanderling	Migration			100S													-	May-Jun	Aug-Oct	-
705	Raptor	Peregrine falcon	Nesting		-JT	-													Feb-Jun	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest													Dec-Jun	-	-	-
919	Waterfowl	Northern pintail	Wintering			10S													-	-	-	-
	Waterfowl	Snow goose	Wintering			1,000S													-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-
991	Gull/Tern	Gulls	Nesting			-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting			-													May-Aug	-	-	-
997	Gull/Tern	Gulls	Nesting			-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting			-													May-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting			3 Pairs													Apr-Aug	-	-	-
1004	Gull/Tern	Gulls	Nesting			-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting			-													May-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting			19 Nests													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Roosting			2 Pairs													-	-	-	-
	Shorebird	American oystercatcher	Wintering			-													-	-	-	-
	Shorebird	Shorebirds	Migration			High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2													-	May-Jun	-	-
1266	Gull/Tern	Forster's tern	Nesting			15 Pairs													May-Jul	-	-	-
1324	Shorebird	American oystercatcher	Wintering			-													-	-	-	-
1331	Shorebird	American oystercatcher	Wintering			-													-	-	-	-
	Shorebird	Shorebirds	Migration			High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2													-	May-Jun	-	-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1758	Turtle	Loggerhead sea turtle	Nesting		T/T	Potential													May-Aug	Jun-Oct	-	Jun-Oct	May-Aug

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1830	Bivalve	Eastern oyster	Harvest Area			-													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
Alcid	Alcids	Wintering			Present													-	-	-	-
	Common loon	Wintering			100S													-	-	-	-
	Common loon	Wintering			10S													-	-	-	-
	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			10S													-	-	-	-
Pelagic	Red-throated loon	Wintering			100S													-	-	-	-
	Northern gannet	Wintering			1,000S													-	-	-	-
	Northern gannet	Wintering			10S													-	-	-	-
Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	American black duck	Wintering			1,000S													-	-	-	-
	American wigeon	Wintering			100S													-	-	-	-
	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Blue-winged teal	Migration			1,000S													-	Feb-Apr	Aug-Oct	-
	Brant	Wintering			1,000S													-	-	-	-
	Brant	Wintering			10,000S													-	-	-	-
	Bufflehead	Wintering			1,000S													-	-	-	-
	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Canada goose	Wintering			1,000S													-	-	-	-
	Common goldeneye	Wintering			10S													-	-	-	-
	Gadwall	Wintering			100S													-	-	-	-
	Gadwall	Wintering			1,000S													-	-	-	-
	Green-winged teal	Wintering			1,000S													-	-	-	-
	Green-winged teal	Wintering			100S													-	-	-	-
	Long-tailed duck	Wintering			Present													-	-	-	-
	Long-tailed duck	Wintering			10S													-	-	-	-
	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Mallard	Wintering			100S													-	-	-	-
	Mergansers	Wintering			100S													-	-	-	-
	Northern pintail	Wintering			100S													-	-	-	-
	Northern shoveler	Wintering			10S													-	-	-	-
	Red-breasted merganser	Wintering			Present													-	-	-	-
	Ruddy duck	Wintering			10S													-	-	-	-
	Scoters	Wintering			1,000S													-	-	-	-
	Snow goose	Wintering			10,000S													-	-	-	-
	Tundra swan	Wintering			10S													-	-	-	-
																		-	-	-	-
																		-	-	-	-
																		-	-	-	-



FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
Diadromous	American eel	Migration			-													-	-	-	Jan-May	Sep-Dec
	Atlantic sturgeon	General Distribution			-													-	-	-	-	Jan-Dec
Marine Pelagic	Sandbar shark	Nursery Area			-													-	-	-	May-Sep	May-Sep
																		-	-	-	-	-

REPTILES & AMPHIBIANS






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

MARINE MAMMALS


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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH


Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Delmarva Peninsula: Map 71A

FISH (continued)

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Eggs	Larvae	Juveniles	Adults
					J	F	M	A	M	J	J	A	S	O	N	D				
Estuarine Nursery	Blueback herring																-	-	Aug-Nov	Feb-Jul
	Blueback herring																-	-	Apr-Oct	Apr-Jun
	Hickory shad																-	-	Jun-Oct	Feb-Jun
	Hickory shad																-	-	Feb-Sep	Feb-Sep
	Striped bass																-	-	-	Jan-Dec
	Striped bass																-	-	May-Oct	Jan-Dec
	Atl. sharpnose shark																-	-	-	May-Oct
	Atlantic croaker																-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic croaker																-	-	Aug-Dec	May-Nov
	Atlantic herring																-	-	Feb-Jun	Feb-Jun
Fish	Atlantic menhaden																-	-	Jan-Dec	May-Oct
	Atlantic menhaden																-	-	May-Nov	May-Oct
	Black drum																-	-	-	Apr-Oct
	Black drum																-	-	May-Oct	Jan-Dec
	Black sea bass																-	-	Apr-Dec	Apr-Dec
	Black sea bass															Jun-Oct	-	-	Apr-Oct	Apr-Oct
	Bluefish																-	-	May-Nov	Apr-Nov
	Bluefish																-	-	May-Oct	May-Oct
	Kingfishes															Apr-Sep	-	-	-	Apr-Oct
	Mullet																-	-	May-Nov	May-Nov
Marine Benthic	Northern puffer																-	-	-	Jan-Dec
	Northern puffer																-	-	Mar-Oct	Mar-Oct
	Pigfish																-	-	-	Apr-Nov
	Pinfish																-	-	May-Oct	-
	Red drum																-	-	Aug-Sep	May-Nov
	Sheepshead																-	-	Apr-Oct	Apr-Oct
	Spot																-	-	Apr-Nov	Jul-Sep
	Spot																-	Dec-Apr	Mar-Nov	Mar-Nov
	Spotted seatrout															May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder																-	Oct-May	-	Apr-Oct
Estuarine Resident	Summer flounder																-	-	Apr-Nov	Apr-Nov
	Summer flounder																-	-	Apr-Nov	Apr-Nov
	Weakfish																-	-	Apr-Nov	Apr-Nov
	Weakfish																-	-	Mar-Oct	Apr-Oct
	White perch																-	May-Aug	Apr-Nov	Apr-Nov
	Winter flounder																-	-	May-Dec	Jan-Dec
	Winter flounder																-	-	Jan-Dec	Feb-Mar
	Killifish																-	-	Jan-Dec	Feb-Mar
	Pipefish																-	-	Jan-Dec	Jan-Dec
	Silversides																-	-	Jan-Dec	Jan-Dec
Marine Benthic	Anchovies																-	-	-	May-Nov
	Anchovies																-	-	Jan-Dec	Jan-Dec
	Great hammerhead																-	-	-	May-Oct
	Striped burrfish																-	-	May-Oct	May-Oct
Marine Benthic	Atlantic angel shark																-	-	-	Jan-Dec
	Atlantic angel shark																-	-	-	Jan-Dec

FISH (continued)

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Atlantic spadefish																-	-	May-Oct	May-Oct		
	Cleannose skate																-	-	-	Jan-Dec		
	Cownose ray																-	-	-	Jan-Dec		
	Northern searobin																-	-	-	Mar-Oct		
	Northern searobin																-	-	-	Mar-Oct		
	Northern stargazer																-	-	Apr-Oct	Apr-Oct		
	Northern stargazer																-	-	Apr-Nov	Apr-Nov		
	Red hake																-	-	Feb-May	Sep-Nov		
	Silver hake																-	-	-	Oct-May		
	Smooth butterfly ray																-	-	May-Oct	May-Oct		
	Smooth dogfish																May-Sep	-	-	Apr-Oct		
	Smooth dogfish																-	-	-	May-Oct		
	Southern stingray																-	-	-	Jan-Dec		
	Spotted hake																-	-	Mar-Jun	Mar-Nov*		
	Spotted hake																-	-	Oct-Jun	-		
	Striped cusk-eel																-	-	May-Oct	-		
	Tautog																Apr-Aug	-	-	Jan-Dec		
	Tautog																-	-	Jan-Dec	Jan-Dec		
	Atlantic mackerel																-	-	Mar-Apr	Mar-Apr		
	Blacktip shark																-	-	-	May-Oct		
	Butterfish																-	-	Jul-Nov	Mar-Nov		
	Butterfish																-	-	May-Oct	-		
	Crevalle jack																-	-	Jun-Oct	-		
	Dusky shark																-	-	-	May-Oct		
	Great white shark																-	-	-	Jan-Dec		
	Lined seahorse																Jun-Sep	Jun-Sep	May-Oct	May-Oct		
	Sand tiger shark																-	-	May-Oct	May-Oct		
	Sandbar shark																-	-	May-Oct	May-Oct		
	Scalloped hammerhead																-	-	May-Sep	May-Oct		
	Scalloped hammerhead																-	-	May-Oct	May-Oct		
	Spanish mackerel																-	-	-	May-Sep		
	Spinner shark																-	-	-	May-Oct		
	Spiny dogfish																-	-	Nov-May	Nov-May		
	Thresher shark																-	-	-	May-Sep		

REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	7,338.24	11.47
10B	Freshwater Marshes	5.76	0.01
10C	Swamps	29.21	0.05
10D	Scrub and Shrub Wetlands	226.49	0.35
9A	Sheltered Tidal Flats	364.66	0.57
7	Exposed Tidal Flats	134.76	0.21

ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	398,181.12	247.42	48%
10B	Freshwater Marshes	619.39	0.38	< 1%
10D	Scrub and Shrub Wetlands	878.49	0.55	< 1%
9A	Sheltered Tidal Flats	397,458.58	246.97	48%
7	Exposed Tidal Flats	1,847.26	1.15	< 1%
3A	Fine to Medium Grained Sand Beaches	22,372.62	13.90	3%
Total ESI Shoreline:		821,357.45	510.37	
Total Shoreline:		413,215.51	256.76	

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

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



Map 71B
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP





BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
33	Shorebird	American oystercatcher	Nesting				1 Pair													Apr-Aug	-	-	-
59	Shorebird	Shorebirds	Migration				Potential													-	May-Jun	Aug-Oct	-
77	Gull/Tern	Forster's tern	Nesting				70 Pairs													May-Jul	-	-	-
	Gull/Tern	Laughing gull	Nesting				20 Pairs													Apr-Aug	-	-	-
78	Gull/Tern	Laughing gull	Nesting				620 Pairs													Apr-Aug	-	-	-
190	Wading	Great egret	Nesting				65 Nests													Apr-Aug	-	-	-
279	Shorebird	Shorebirds	Migration				High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration				222 Birds/Km2													-	May-Jun	-	-
280	Gull/Tern	Forster's tern	Nesting				32 Pairs													May-Jul	-	-	-
	Gull/Tern	Laughing gull	Nesting				8 Pairs													Apr-Aug	-	-	-
	Shorebird	Shorebirds	Migration				High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration				222 Birds/Km2													-	May-Jun	-	-
333	Gull/Tern	Common tern	Nesting				12 Pairs													May-Aug	-	-	-
	Gull/Tern	Forster's tern	Nesting				8 Pairs													May-Jul	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
922	Waterfowl	Northern pintail	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
1005	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting				-													May-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting				6 Pairs													Apr-Aug	-	-	-
1324	Shorebird	American oystercatcher	Wintering				-													-	-	-	-
1328	Shorebird	American oystercatcher	Wintering				-													-	-	-	-
	Gull/Tern	Forster's tern	Nesting				25 Pairs													May-Jul	-	-	-
	Gull/Tern	Gull-billed tern	Nesting			E/T	6 Pairs													May-Jul	-	-	-
	Gull/Tern	Laughing gull	Nesting				1200 Pairs													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting				2 Nests													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Wintering				-													-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
1830	Bivalve	Eastern oyster	Harvest Area				-													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec

BIRDS

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

BIRDS (continued)

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Eggs	Larvae	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Tundra swan	Wintering			10S													-	-	-	-	-
	Tundra swan	Wintering			Present													-	-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Sandbar shark	Nursery Area			-													-	-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS

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

MARINE MAMMALS

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








ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH







Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Alewife													-	-	-	Apr-May	Mar-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	Aug-Nov	Apr-Jun
	Blueback herring													-	-	-	Apr-Oct	Apr-Jun
	Hickory shad													-	-	-	Feb-Sep	Feb-Sep
	Striped bass													-	-	-	May-Oct	Jan-Dec
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	Feb-Jun	Feb-Jun
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Black drum													-	-	-	May-Oct	Jan-Dec
	Black sea bass													-	-	-	Apr-Dec	Apr-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Clearnose skate													-	-	-	Jan-Dec	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	May-Oct	May-Oct
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	May-Oct	-
	Crevalle jack													-	-	-	Jun-Oct	-
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep


REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	5,059.14	7.90
10B	Freshwater Marshes	249.07	0.39
10C	Swamps	983.45	1.54
10D	Scrub and Shrub Wetlands	164.99	0.26
9A	Sheltered Tidal Flats	2,425.22	3.79

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	345,822.41	214.88	49%
10B	Freshwater Marshes	148.87	0.09	< 1%
10C	Swamps	1,372.30	0.85	< 1%
10D	Scrub and Shrub Wetlands	182.02	0.11	< 1%
9A	Sheltered Tidal Flats	346,454.31	215.28	49%
9B	Vegetated Low Banks	5,766.30	3.58	1%
8B	Sheltered, Solid Man-Made Structures	1,144.06	0.71	< 1%
8C	Sheltered Riprap	183.08	0.11	< 1%
5	Mixed Sand and Gravel Beaches	378.37	0.24	< 1%
3A	Fine to Medium Grained Sand Beaches	1,049.56	0.65	< 1%

Total ESI Shoreline: 702,501.28 Total ESI Shoreline: 436.51
 Total Shoreline: 347,245.46 Total Shoreline: 215.77

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 71C
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
							J	F	M	A	M	J	J	A	S	O	N	D				
1	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	20	Waterfowl	American black duck			Present													Apr-Jul	-	-	-
	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	Northern pintail	Wintering			10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering			10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-
26	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering			10,000S													-	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Northern pintail	Wintering			10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering			10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-
59	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering			10,000S													-	-	-	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
74	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Shorebird	Shorebirds	Migration			Potential													-	May-Jun	Aug-Oct	-
	74	Gull/Tern	Black skimmer			E/-													May-Sep	-	-	-
	Gull/Tern	Common tern	Nesting			9 Pairs													May-Aug	-	-	-
75	Gull/Tern	Forster's tern	Nesting			90 Pairs													May-Jul	-	-	-
	Shorebird	American oystercatcher	Roosting			1 Pair													-	-	-	-
	Shorebird	American oystercatcher	Nesting			2 Pairs													Apr-Aug	-	-	-
	Shorebird	Shorebirds	Migration			High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2													-	May-Jun	-	-
356	Shorebird	Black-bellied plover	Migration			100S													-	May-Jun	Sep-Dec	-
	Shorebird	Dunlin	Migration			1000S													-	Apr-May	Oct-Nov	-
	Shorebird	Red knot	Migration			T/T T Up To 185 Birds/Km													-	Apr-Jun	Jul-Oct	-
	Shorebird	Sanderling	Migration			100S													-	May-Jun	Aug-Oct	-
	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-
768	Waterfowl	American wigeon	Wintering			100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Blue-winged teal	Migration			100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
	Waterfowl	Gadwall	Wintering			100S													-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-
	Waterfowl	Northern pintail	Wintering			10S													-	-	-
	Waterfowl	Northern shoveler	Wintering			10S													-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-
774	Waterfowl	American black duck	Wintering			1,000S													-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-
	Waterfowl	Mallard	Wintering			100S													-	-	-
	Waterfowl	Northern pintail	Wintering			100S													-	-	-
	Waterfowl	Northern shoveler	Wintering			10S													-	-	-
	Waterfowl	Snow goose	Wintering			10,000S													-	-	-
797	Waterfowl	Tundra swan	Wintering			10S													-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct
	Waterfowl	Brant	Wintering			10,000S													-	-	-
	Waterfowl	Gadwall	Wintering			100S													-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-
	Waterfowl	Gulls	Nesting			-													-	-	-
1006	Gull/Tern	Terns	Nesting			-													-	-	-
	Gull/Tern	American oystercatcher	Nesting			19 Nests													-	Apr-Jul	May-Aug
	Shorebird	American oystercatcher	Roosting			2 Pairs													-	Apr-Aug	-
	Shorebird	American oystercatcher	Wintering			-													-	-	-
	Diving	Common loon	Wintering			10S													-	-	-
	Pelagic	Northern gannet	Wintering			10S													-	-	-
	Waterfowl	Blue-winged teal	Migration			1,000S													-	Feb-Apr	Aug-Oct
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S													-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-
	Diving	Common loon	Wintering			10S													-	-	-
1040	Pelagic	Northern gannet	Wintering			10S													-	-	-
	Waterfowl	Blue-winged teal	Migration			1,000S													-	Feb-Apr	Aug-Oct
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-
1126	Diving	Common loon	Wintering			Present													-	-	-
	Diving	Red-throated loon	Wintering			10S													-	-	-
	Pelagic	Northern gannet	Wintering			100S													-	-	-
	Waterfowl	American black duck	Wintering			100S													-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
	Waterfowl	Gadwall	Wintering			10S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Mallard	Wintering			10S													-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-
	Waterfowl	Scoters	Wintering			100S													-	-	-
1131	Diving	Common loon	Wintering			Present													-	-	-
	Diving	Red-throated loon	Wintering			10S													-	-	-
	Pelagic	Northern gannet	Wintering			100S													-	-	-
	Waterfowl	American black duck	Wintering			100S													-	-	-
	Waterfowl	Gadwall	Wintering			10S													-	-	-
	Waterfowl	Mallard	Wintering			10S													-	-	-
	Waterfowl	Scoters	Wintering			100S													-	-	-
1174	Waterfowl	Bufflehead	Wintering			1,000S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S													-	-	-
	Waterfowl	Mergansers	Wintering			100S													-	-	-
1291	Shorebird	Piping plover	Nesting	E/T	T	2 Nests												Apr-Aug	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1603	Marine Pelagic	Sandbar shark	Nursery Area			-													-	-	May-Sep	May-Sep




REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1766	Turtle	Loggerhead sea turtle	Nesting	T/T	T	0-1 Nest												May-Aug	Jun-Oct	-	Jun-Oct	May-Aug
1778	Turtle	Green sea turtle	General Distribution	T/T	T	Rare												-	-	-	Jul-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Rare												-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	May-Nov	May-Nov

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1830	Bivalve	Eastern oyster	Harvest Area			-												Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec


BIRDS

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Alcid	Wintering			Present													-	-	-	-
	Common loon	Wintering			100S													-	-	-	-
	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			10S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Northern gannet	Wintering			1,000S													-	-	-	-
	Brant	Wintering			1,000S													-	-	-	-
	Canada goose	Wintering			1,000S													-	-	-	-
	Long-tailed duck	Wintering			Present													-	-	-	-
	Red-breasted merganser	Wintering			Present													-	-	-	-
	Scooters	Wintering			1,000S													-	-	-	-
	Snow goose	Wintering			1,000S													-	-	-	-



FISH

Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	American eel	Migration			-													-	-	-	Jan-May	Sep-Dec
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec

REPTILES & AMPHIBIANS






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

MARINE MAMMALS



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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-	-
	D. crested cormorant													-	-	-	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-
	Shearwaters													-	-	-	-	-
	Storm-petrels													-	-	-	-	-
	Willet													May-Jul	-	-	-	-
	Clapper rail													Apr-Sep	-	-	-	-
	Waterfowl													Apr-Jul	-	-	Jul-Aug	-

FISH

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

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	-	Jan-Dec
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Great hammerhead													-	-	-	-	May-Oct
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	-	Mar-Oct
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	-	Mar-Nov*
	Spotted hake													-	-	-	-	Oct-Jun
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													-	-	-	-	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Atlantic mackerel													-	-	-	-	Mar-Apr
	Blacktip shark													-	-	-	-	May-Oct

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Butterfish													-	-	-	May-Oct	-
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Crevalle jack													-	-	-	Jun-Oct	-
	Dusky shark													-	-	-	May-Oct	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep
	Spanish mackerel													-	-	-	-	May-Sep
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	Nov-May	Nov-May
	Thresher shark													-	-	-	-	May-Sep



REPTILES & AMPHIBIANS

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

INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
Bivalve	Atlantic surfclam													-	-	-	-	Jan-Dec
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													May-Oct	May-Oct	May-Oct	Jan-Dec	Jan-Dec
	Squid													-	-	-	-	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Atlantic rock crab													-	-	-	-	Jan-Dec
	Blue crab													-	-	May-Nov	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Hermit crab													-	-	-	-	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Horseshoe crab													Apr-Aug	Apr-Aug	-	Jan-Dec	Jan-Dec
	Lady crab													-	-	-	-	Jan-Dec
	Spider crabs													-	-	-	Jan-Dec	Jan-Dec
	Channeled whelk													-	-	-	Jan-Dec	Jan-Dec
	Knobbed whelk													-	-	-	Jan-Dec	Jan-Dec
	American lobster													-	-	-	-	May-Nov
	Brown shrimp													-	-	-	May-Oct	May-Oct
	Brown shrimp													-	-	May-Jun	May-Oct	May-Oct
	Grass shrimp													May-Sep	Jun-Sep	Jan-Dec	Jan-Dec	Jan-Dec
	Mantis shrimp													-	-	-	Jan-Dec	Jan-Dec
	Sand shrimp													May-Sep	Jun-Sep	Jan-Dec	Jan-Dec	Jan-Dec
	White shrimp													-	-	-	May-Oct	May-Oct

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES		
ESI Rank	Habitat Classification	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	3.37
10B	Freshwater Marshes	0.02
10D	Scrub and Shrub Wetlands	0.09
9A	Sheltered Tidal Flats	0.27
7	Exposed Tidal Flats	0.02

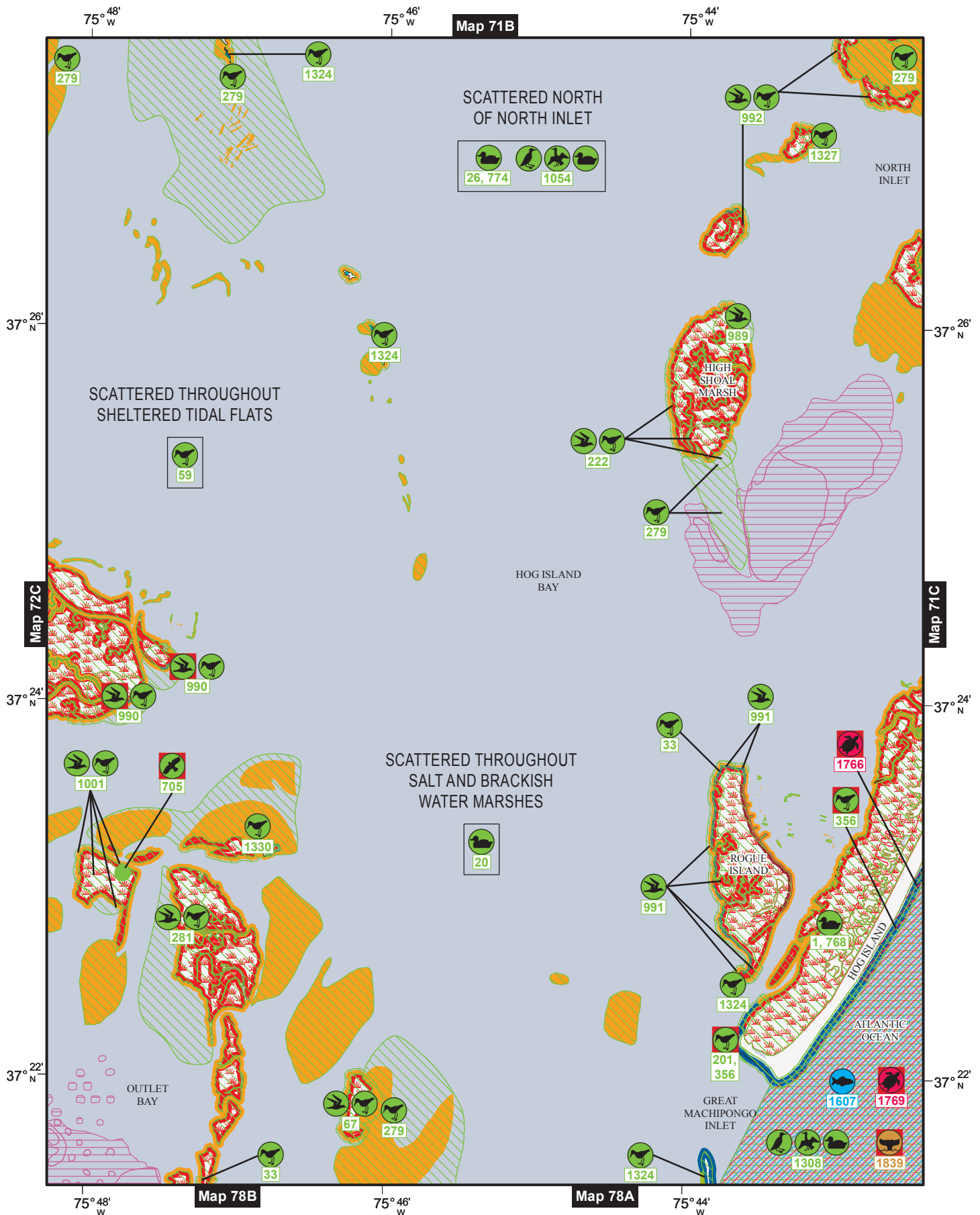
ESI SHORELINE HABITAT TYPES		
ESI Rank	Shoreline Habitat Classification	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	48%
9A	Sheltered Tidal Flats	48%
3A	Fine to Medium Grained Sand Beaches	4%

Total ESI Shoreline: 313,984.08 Total ESI Shoreline: 195.10
 Total Shoreline: 163,140.53 Total Shoreline: 101.37

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

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





Map 71D
Delmarva Peninsula



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

0 1 Miles
Not for Navigation
0 1 Kilometers

1:50,000



Map 71D
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence											
						J	F	M	A	M	J	J	A	S	O	N	D
1	Waterfowl	American black duck	Nesting		Present												
	Waterfowl	Canada goose	Nesting		Present												
	Waterfowl	Mallard	Nesting		Present												
20	Waterfowl	American black duck	Nesting		Present												
	Waterfowl	American black duck	Wintering		1,000S												
	Waterfowl	American wigeon	Wintering		100S												
	Waterfowl	Blue-winged teal	Migration		100S												
	Waterfowl	Canada goose	Nesting		Present												
	Waterfowl	Gadwall	Wintering		100S												
	Waterfowl	Green-winged teal	Wintering		100S												
	Waterfowl	Mallard	Nesting		Present												
	Waterfowl	Mallard	Wintering		100S												
	Waterfowl	Northern pintail	Wintering		10S												
	Waterfowl	Northern shoveler	Wintering		10S												
	Waterfowl	Tundra swan	Wintering		100S												
26	Waterfowl	American black duck	Nesting		Present												
	Waterfowl	Blue-winged teal	Migration		100S												
	Waterfowl	Brant	Wintering		10,000S												
	Waterfowl	Canada goose	Nesting		Present												
	Waterfowl	Gadwall	Wintering		100S												
	Waterfowl	Green-winged teal	Wintering		100S												
	Waterfowl	Mallard	Nesting		Present												
33	Shorebird	American oystercatcher	Nesting		1 Pair												
59	Shorebird	Shorebirds	Migration		Potential												
67	Gull/Tern	Laughing gull	Nesting		24 Pairs												
	Shorebird	American oystercatcher	Nesting		3 Nests												
201	Shorebird	American oystercatcher	Nesting		-												
	Shorebird	Piping plover	Nesting		-												
222	Gull/Tern	Forster's tern	Nesting		35 Pairs												
	Gull/Tern	Laughing gull	Nesting		12 Pairs												

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	J	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
									J	F	M	A	M	J	J	A	S	O	N	D				
279	Shorebird	American oystercatcher	Nesting				3 Pairs														Apr-Aug	-	-	-
	Shorebird	Shorebirds	Migration				High														-	May-Jun	Aug-Oct	-
281	Shorebird	Whimbrel	Migration				222 Birds/Km2														-	May-Jun	-	-
	Gull/Tern	Forster's tern	Nesting				85 Pairs														May-Jul	-	-	-
	Gull/Tern	Laughing gull	Nesting				75 Pairs														Apr-Aug	-	-	-
	Shorebird	Shorebirds	Migration				High														-	May-Jun	Aug-Oct	-
356	Shorebird	Whimbrel	Migration				222 Birds/Km2														-	May-Jun	-	-
	Shorebird	Black-bellied plover	Migration				100S														-	May-Jun	-	-
705	Shorebird	Dunlin	Migration				1000S														-	May-Jun	Sep-Dec	-
	Shorebird	Red knot	Migration				Up To 185 Birds/Km														-	Apr-May	Oct-Nov	-
	Shorebird	Sanderling	Migration				100S														-	Apr-Jun	Jul-Oct	-
	Raptor	Peregrine falcon	Nesting				-														-	May-Jun	Aug-Oct	-
768	Waterfowl	American black duck	Wintering				1,000S														Feb-Jun	-	-	-
	Waterfowl	American wigeon	Wintering				100S														-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S														-	Feb-Apr	Aug-Oct	-
	Waterfowl	Gadwall	Wintering				100S														-	-	-	-
774	Waterfowl	Green-winged teal	Wintering				100S														-	-	-	-
	Waterfowl	Mallard	Wintering				100S														-	-	-	-
	Waterfowl	Northern pintail	Wintering				10S														-	-	-	-
	Waterfowl	Northern shoveler	Wintering				10S														-	-	-	-
989	Waterfowl	Tundra swan	Wintering				100S														-	-	-	-
	Waterfowl	American black duck	Wintering				1,000S														-	-	-	-
	Waterfowl	American wigeon	Wintering				100S														-	-	-	-
	Waterfowl	Mallard	Wintering				100S														-	-	-	-
990	Waterfowl	Northern pintail	Wintering				100S														-	-	-	-
	Waterfowl	Northern shoveler	Wintering				10S														-	-	-	-
	Waterfowl	Snow goose	Wintering				10,000S														-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S														-	-	-	-
991	Gull/Tern	Forster's tern	Nesting				10 Pairs														May-Jul	-	-	-
	Gull/Tern	Gulls	Nesting				-														Apr-Jul	-	-	-
	Gull/Tern	Common tern	Nesting				75 Pairs														May-Aug	-	-	-
	Gull/Tern	Forster's tern	Nesting				26 Pairs														May-Jul	-	-	-
992	Gull/Tern	Gull-billed tern	Nesting				66 Pairs														May-Jul	-	-	-
	Gull/Tern	Gulls	Nesting				-														Apr-Jul	-	-	-
	Shorebird	American oystercatcher	Nesting				8 Pairs														Apr-Aug	-	-	-
	Gull/Tern	Gulls	Nesting				-														Apr-Jul	-	-	-
1001	Gull/Tern	Terns	Nesting				-														May-Aug	-	-	-
	Gull/Tern	Gulls	Nesting				-														Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting				-														May-Aug	-	-	-
	Gull/Tern	Terns	Nesting				-														Apr-Jul	-	-	-
1001	Shorebird	American oystercatcher	Nesting				1 Pair														Apr-Aug	-	-	-
	Gull/Tern	Gulls	Nesting				-														Apr-Jul	-	-	-
	Gull/Tern	Laughing gull	Nesting				1835 Pairs														Apr-Aug	-	-	-
	Gull/Tern	Terns	Nesting				-														May-Aug	-	-	-
1001	Shorebird	American oystercatcher	Nesting				1 Pair														Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting				1 Pair														Apr-Aug	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
1054	Shorebird	American oystercatcher	Wintering			-													-	-	-
	Diving	Common loon	Wintering			10S													-	-	-
	Diving	D. crested cormorant	Wintering			1,000S													Mar-May	Aug-Nov	-
	Diving	Red-throated loon	Wintering			100S													-	-	-
	Pelagic	Northern gannet	Wintering			10S													-	-	-
1308	Waterfowl	Blue-winged teal	Migration			1,000S													Feb-Apr	Aug-Oct	-
	Waterfowl	Common goldeneye	Wintering			10S													-	-	-
	Waterfowl	Gadwall	Wintering			1,000S													-	-	-
	Waterfowl	Green-winged teal	Wintering			1,000S													-	-	-
	Waterfowl	Ruddy duck	Wintering			10S													-	-	-
	Waterfowl	Scoters	Wintering			1,000S													-	-	-
	Alcid	Alcids	Wintering			Present													-	-	-
	Diving	Common loon	Wintering			100S													-	-	-
	Diving	D. crested cormorant	Wintering			1,000S													Mar-May	Aug-Nov	-
	Diving	Red-throated loon	Wintering			100S													-	-	-
1324	Pelagic	Northern gannet	Wintering			1,000S													-	-	-
	Waterfowl	Long-tailed duck	Wintering			Present													-	-	-
	Waterfowl	Red-breasted merganser	Wintering			Present													-	-	-
	Waterfowl	Scoters	Wintering			1,000S													-	-	-
	Shorebird	American oystercatcher	Wintering			-													-	-	-
1327	Shorebird	American oystercatcher	Nesting			2 Pair												Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Wintering			-												-	-	-	-
1330	Shorebird	American oystercatcher	Nesting			3 Pairs												Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Wintering			-												-	-	-	-
	Shorebird	Shorebirds	Migration			High												May-Jun	Aug-Oct	-	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2												May-Jun	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N						D
1607	Diadromous	American eel	Migration			-													-	-	-	Jan-May	Sep-Dec

REPTILES & AMPHIBIANS




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1766	Turtle	Loggerhead sea turtle	Nesting	T/T	T	0-1 Nest												May-Aug	Jun-Oct	-	Jun-Oct	May-Aug
1769	Turtle	Green sea turtle	General Distribution	T/T	T	Rare												-	-	-	May-Dec*	-
	Turtle	Green sea turtle	General Distribution	T/T	T	Common												-	-	-	Jul-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common												-	-	-	Apr-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Uncommon												-	-	-	Nov-Dec	-
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Rare												-	-	-	Mar-Dec*	Mar-Dec*
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Common												-	-	-	May-Jun	May-Jun
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant												-	-	-	Apr-Oct	Apr-Oct
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common												-	-	-	Nov-Dec	Nov-Dec

MARINE MAMMALS


Map ID	Subelement	Species	MD/VA	Mapping Qualifier	S	F	Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
1839	Whale	Fin whale		General Distribution	E/E	E	Common													-	-	-	-
	Whale	Humpback whale		General Distribution	E/E	E	Uncommon													-	-	-	-
	Whale	Humpback whale		General Distribution	E/E	E	Common													-	-	-	-
	Whale	N.A. right whale		General Distribution	E/E	E	Rare													-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	MD/VA	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
							J	F	M	A	M	J	J	A	S	O	N	D				
	Diving	Common loon		Wintering		Present													-	-	-	-
		Grebes		Wintering		10S													-	-	-	-
	Pelagic	Red-throated loon		Wintering		10S													-	-	-	-
		Northern gannet		Wintering		100S													-	-	-	-
	Waterfowl	American black duck		Wintering		100S													-	-	-	-
		Brant		Wintering		1,000S													-	-	-	-
		Bufflehead		Wintering		1,000S													-	-	-	-
		Canada goose		Wintering		1,000S													-	-	-	-
		Gadwall		Wintering		10S													-	-	-	-
		Long-tailed duck		Wintering		10S													-	-	-	-
		Mallard		Wintering		10S													-	-	-	-
		Mergansers		Wintering		100S													-	-	-	-
		Scoters		Wintering		100S													-	-	-	-
		Snow goose		Wintering		1,000S													-	-	-	-

FISH

Subelement	Species	MD/VA	Mapping Qualifier	S	F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
							J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Atlantic sturgeon		General Distribution	-/E	E													-	-	-	-	Jan-Dec
	Marine Pelagic	Sandbar shark		Nursery Area															-	-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS

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

INVERTEBRATES

Subelement	Species	MD/VA	Mapping Qualifier	S	F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
							J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve	Eastern oyster		Harvest Area															Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
																			-	-	-	-	-

MD/VA Monthly Presence




ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

Monthly Presence


FISH

802

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													Apr-Sep	-	-	-	Apr-Oct
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	-	Jan-Dec
	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
 Estuarine Resident	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
 Fish	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Great hammerhead													-	-	-	-	May-Oct
	Striped burrfish													-	-	-	May-Oct	May-Oct
 Marine Benthic	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern searobin													-	-	-	-	Mar-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													-	-	-	Jan-Dec	Jan-Dec
	Tautog													Apr-Aug	-	-	-	Jan-Dec






FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Marine Pelagic													-	-	-	-	Mar-Apr
	Atlantic mackerel													-	-	-	-	May-Oct
	Blacktip shark													-	-	-	-	Mar-Nov
	Butterfish													-	-	-	-	May-Oct
	Butterfish													-	-	-	-	May-Oct
	Crevalle jack													-	-	-	-	May-Oct
	Dusky shark													-	-	-	-	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Lined seahorse													-	-	-	-	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	-	May-Oct
	Scalloped hammerhead													-	-	-	-	May-Oct
	Scalloped hammerhead													-	-	-	-	May-Oct
	Spanish mackerel													-	-	-	-	May-Oct
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	-	Nov-May
	Thresher shark													-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

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



INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Bivalve													-	-	-	-	Jan-Dec
	Bay scallop													-	-	-	-	Jan-Dec
	Eastern oyster													-	-	-	-	Jan-Dec
	Cephalopod													-	-	-	-	Jan-Dec
	Squid													-	-	-	-	Jan-Dec
	Squid													-	-	-	-	Jan-Dec
	Crab													-	-	-	-	Jan-Dec
	Atlantic rock crab													-	-	-	-	Jan-Dec
	Blue crab													-	-	-	-	Jan-Dec
	Blue crab													-	-	-	-	Jan-Dec
	Hermit crab													-	-	-	-	Jan-Dec
	Horseshoe crab													-	-	-	-	Jan-Dec
	Horseshoe crab													-	-	-	-	Jan-Dec
	Lady crab													-	-	-	-	Jan-Dec
	Spider crabs													-	-	-	-	Jan-Dec
	Channeled whelk													-	-	-	-	Jan-Dec
	Gastropod													-	-	-	-	Jan-Dec
	Knobbed whelk													-	-	-	-	Jan-Dec
	American lobster													-	-	-	-	May-Nov
	Lobster													-	-	-	-	May-Nov
	Brown shrimp													-	-	-	-	May-Oct
	Brown shrimp													-	-	-	-	May-Oct
	Grass shrimp													-	-	-	-	May-Oct
	Grass shrimp													-	-	-	-	May-Oct

INVERTEBRATES (continued)


Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
	Mantis shrimp													-	-	Jan-Dec	Jan-Dec
	Sand shrimp													May-Sep	Jan-Dec	Jan-Dec	Jan-Dec
	White shrimp													-	-	May-Oct	May-Oct

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES			Area (Sq. Miles)	
ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)	
 10A	Salt and Brackish Water Marshes	1,599.22	2.50	
10B	Freshwater Marshes	0.11	0.00	
9A	Sheltered Tidal Flats	1,081.37	1.69	
7	Exposed Tidal Flats	0.87	0.00	

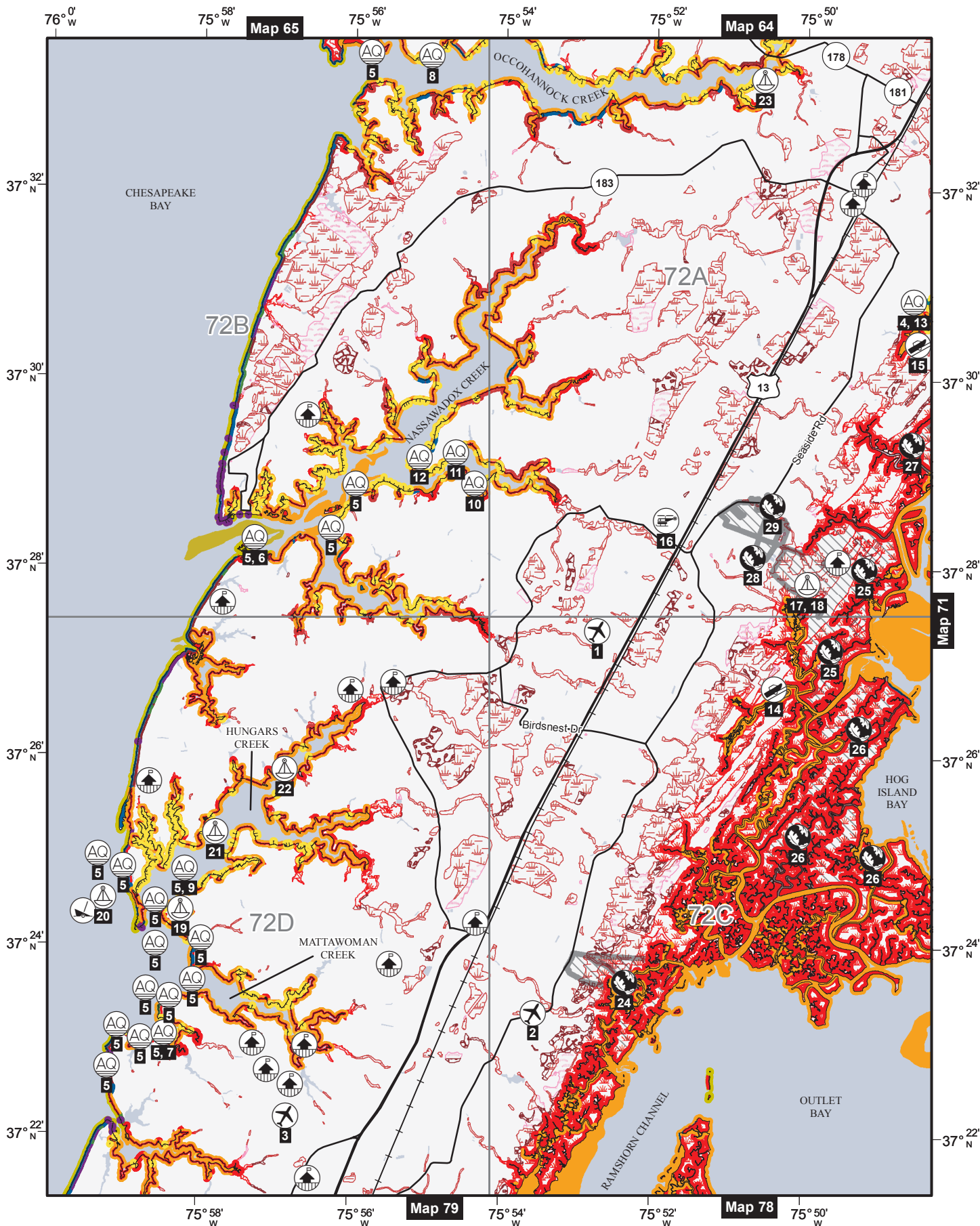
ESI SHORELINE HABITAT TYPES					
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline	
<div></div> 10A	Salt and Brackish Water Marshes	91,440.08	56.82	47%	
10D	Scrub and Shrub Wetlands	1,861.20	1.16	1%	
9A	Sheltered Tidal Flats	92,489.90	57.47	47%	
7	Exposed Tidal Flats	148.17	0.09	< 1%	
5	Mixed Sand and Gravel Beaches	1,912.63	1.19	1%	
3A	Fine to Medium Grained Sand Beaches	8,394.28	5.22	4%	

Total ESI Shoreline: 196,246.26 Total ESI Shoreline: 121.94
Total Shoreline: 97,051.98 Total Shoreline: 60.31

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 72
Delmarva Peninsula



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 72
Delmarva Peninsula

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	AIRPORT	CAMPBELL FIELD		
2	AIRPORT	MACHIPONGO INTL		
3	AIRPORT	MEARS FIELD		
4	AQUACULTURE	HARD CLAMS BALLARD FISH AND OYSTER C RF#97-0275	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	AQUACULTURE	HARD CLAMS OB RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
6	AQUACULTURE	OYSTER COMMERCIAL BUNCE STEPHEN RF#2002-1519	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
7	AQUACULTURE	OYSTER NON-COMM BONNEFORD, LOUIS RF#99-1495	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
8	AQUACULTURE	OYSTER NON-COMM CLIFFORD RF#99-1632	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
9	AQUACULTURE	OYSTER NON-COMM GASKINS RF#99-1456	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
10	AQUACULTURE	OYSTER NON-COMM HOLCOMB, HARRY S. RF#2000-1881	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
11	AQUACULTURE	OYSTER NON-COMM HOUCK RF#991494	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
12	AQUACULTURE	OYSTER NON-COMM NORTHAMPTON HIGH SCH RF#2000-2086	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
13	AQUACULTURE	OYSTER NON-COMM NORTHAMPTON HIGH SCH RF#2000-2177	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
14	BOAT RAMP	RED BANK	LENE PENNINGTON, VDGIF	804-367-0058
15	BOAT RAMP	WILLIS WHARF	VIRGINIA DEPT. OF GAME AND INLAND FISHERIES	804-367-1000
16	HELIPORT	NORTHAMPTON ACCOMACK MEMORIAL HOSPITAL		
17	REPEATED MEASUREMENT SITE	LTER VCR PHILLIPS CREEK LOGGER 2 METEOROLOGICAL ST	LONG TERM ECOL. RESEARCH NETWORK OFFICE	505-277-2597
18	REPEATED MEASUREMENT SITE	LTER VCR PHILLIPS CREEK METEOROLOGICAL ST	LONG TERM ECOL. RESEARCH NETWORK OFFICE	505-277-2597
19	REPEATED MEASUREMENT SITE	WQ - STATION H-1	CHESAPEAKE BAY PROGRAM	800-968-7229
20	REPEATED MEASUREMENT SITE	WQ - STATION H-1A	CHESAPEAKE BAY PROGRAM	800-968-7229
21	REPEATED MEASUREMENT SITE	WQ - STATION H-2	CHESAPEAKE BAY PROGRAM	800-968-7229
22	REPEATED MEASUREMENT SITE	WQ - STATION H-3	CHESAPEAKE BAY PROGRAM	800-968-7229
23	REPEATED MEASUREMENT SITE	WQ - STATION OC-3	CHESAPEAKE BAY PROGRAM	800-968-7229
DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
24	NATURE CONSERVANCY	BOX TREE	THE NATURE CONSERVANCY	703-841-5300
25	NATURE CONSERVANCY	BROWNSVILLE FARM	THE NATURE CONSERVANCY	703-841-5300
26	NATURE CONSERVANCY	FOWLING POINT	THE NATURE CONSERVANCY	703-841-5300
27	NATURE CONSERVANCY	GREENS CREEK	THE NATURE CONSERVANCY	703-841-5300
28	NATURE CONSERVANCY	PHILLIPS CREEK	THE NATURE CONSERVANCY	703-841-5300
29	NATURE CONSERVANCY	UPSHUR CREEK	THE NATURE CONSERVANCY	703-841-5300
ALSO PRESENT IN MAPPED AREA (POLYGONS)				
Type	Name	Contact	Phone	
STATE PROTECTED AREA	BLUE CRAB SANCTUARY	VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200	
STATE PROTECTED AREA	TIDAL LANDS	VA MARINE RESOURCES COMMISSION		

JURISDICTIONS

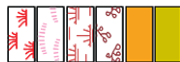
COUNTY: ACCOMACK COUNTY, NORTHAMPTON COUNTY
COAST GUARD: DISTRICT 5, SECTOR HAMPTON ROADS
USACE: NORTH ATLANTIC DIVISION, NORFOLK DISTRICT

FEMA: REGION I
EPA: REGION 3

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	8,484.31	13.26
10B	Freshwater Marshes	1,015.64	1.59
10C	Swamps	5,591.84	8.74
10D	Scrub and Shrub Wetlands	1,121.98	1.75
9A	Sheltered Tidal Flats	1,203.02	1.88
7	Exposed Tidal Flats	169.49	0.26



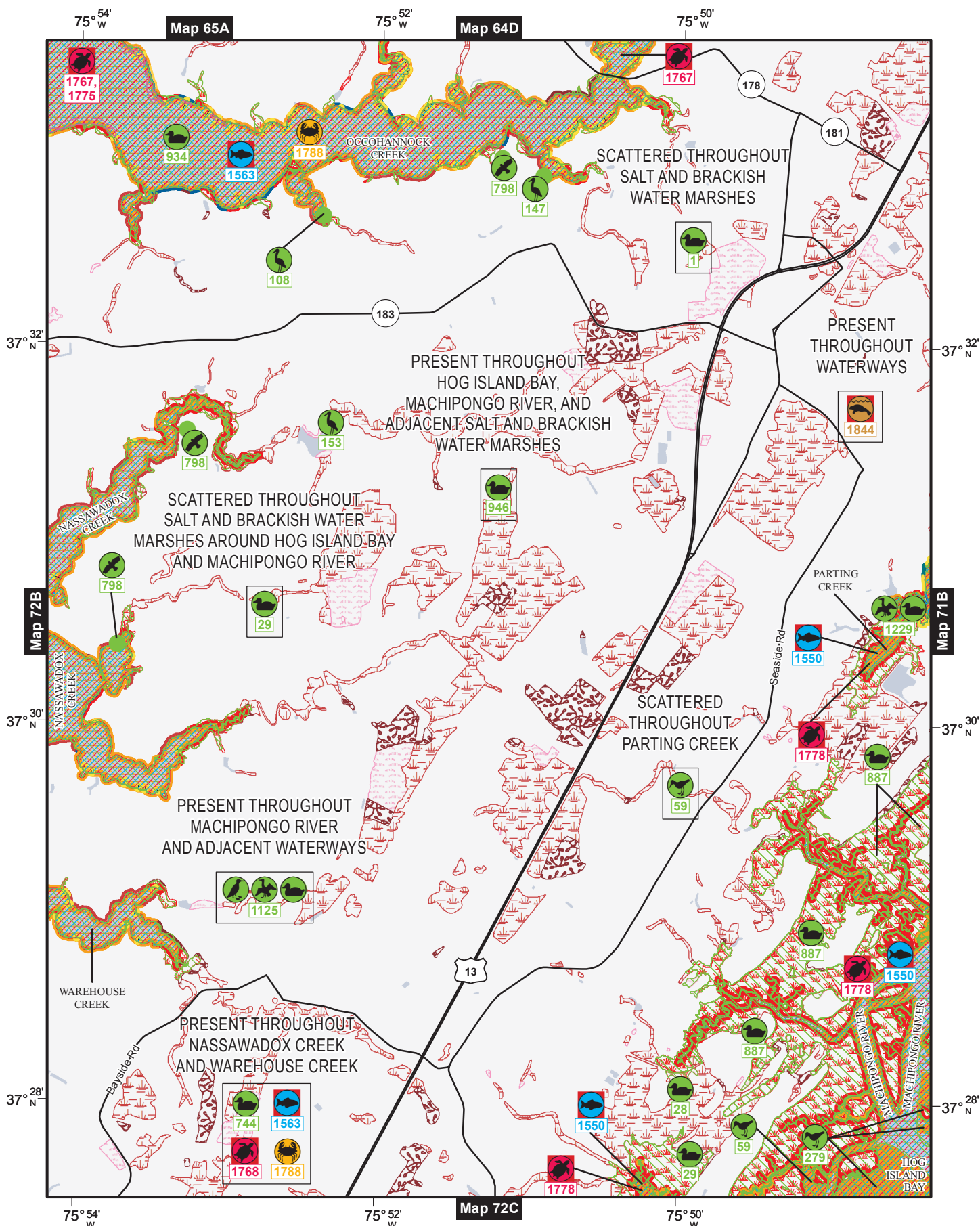
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	738,032.39	458.59	42%
10B	Freshwater Marshes	26.29	0.02	< 1%
10C	Swamps	20,744.25	12.89	1%
10D	Scrub and Shrub Wetlands	10,719.38	6.66	1%
9A	Sheltered Tidal Flats	731,086.35	454.28	42%
9B	Vegetated Low Banks	150,450.20	93.49	9%
8B	Sheltered, Solid Man-Made Structures	20,139.88	12.51	1%
8C	Sheltered Riprap	1,869.41	1.16	< 1%
7	Exposed Tidal Flats	32,478.62	20.18	2%
6A	Gravel Beaches	540.21	0.34	< 1%
6B	Riprap	4,709.17	2.93	< 1%
4	Coarse Grained Sand Beaches	137.78	0.09	< 1%
3A	Fine to Medium Grained Sand Beaches	34,241.78	21.28	2%
3B	Scarp and Steep Slopes (Sand)	1,620.67	1.01	< 1%
1B	Exposed, Solid Man-Made Structures	5,724.34	3.56	< 1%
Total ESI Shoreline:		1,752,520.73	1,088.97	
Total Shoreline:		782,765.69	486.39	

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 72A
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
1	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-	
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul	
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug	
28	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-	
	Waterfowl	American black duck	Wintering			1,000S												-	-	-	-	
	Waterfowl	Brant	Wintering			1,000S												-	-	-	-	
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul	
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug	
	Waterfowl	Mallard	Wintering			100S												-	-	-	-	
	Waterfowl	Northern pintail	Wintering			10S												-	-	-	-	
	Waterfowl	Northern shoveler	Wintering			10S												-	-	-	-	
	Waterfowl	Snow goose	Wintering			1,000S												-	-	-	-	
29	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-	
	Waterfowl	American black duck	Wintering			1,000S												-	-	-	-	
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul	
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug	
	Waterfowl	Mallard	Wintering			100S												-	-	-	-	
	Waterfowl	Northern pintail	Wintering			10S												-	-	-	-	
	Waterfowl	Northern shoveler	Wintering			10S												-	-	-	-	
	Waterfowl	Snow goose	Wintering			1,000S												-	-	-	-	
	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-	
59	Waterfowl	American black duck	Wintering			1,000S												-	-	-	-	
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul	
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug	
	Waterfowl	Mallard	Wintering			100S												-	-	-	-	
	Waterfowl	Northern pintail	Wintering			10S												-	-	-	-	
	Waterfowl	Northern shoveler	Wintering			10S												-	-	-	-	
108	Shorebird	Shorebirds	Migration			Potential												-	May-Jun	Aug-Oct	-	
147	Wading	Great blue heron	Nesting			6 Nests												Feb-Jun	-	-	-	
147	Wading	Great blue heron	Nesting			17 Nests												Feb-Jun	-	-	-	
153	Wading	Great blue heron	Nesting			4 Nests												Feb-Jun	-	-	-	
279	Shorebird	Shorebirds	Migration			High												-	May-Jun	Aug-Oct	-	
	Shorebird	Whimbrel	Migration			222 Birds/Km2												-	May-Jun	-	-	
	Waterfowl	American black duck	Wintering			100S												-	-	-	-	
744	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-	-	
	Waterfowl	Canvasback	Wintering			10S												-	-	-	-	
	Waterfowl	Mallard	Wintering			100S												-	-	-	-	
	Waterfowl	Mergansers	Wintering			100S												-	-	-	-	
	Waterfowl	Ring-necked duck	Wintering			100S												-	-	-	-	
	Waterfowl	Ruddy duck	Wintering			1,000S												-	-	-	-	

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
798	Waterfowl	Scaup	Wintering			100S												-	-	-	-
	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-
887	Waterfowl	American black duck	Wintering			1,000S												-	-	-	-
	Waterfowl	Mallard	Wintering			100S												-	-	-	-
	Waterfowl	Northern pintail	Wintering			10S												-	-	-	-
	Waterfowl	Northern shoveler	Wintering			10S												-	-	-	-
	Waterfowl	American black duck	Wintering			1,000S												-	-	-	-
934	Waterfowl	Brant	Wintering			10S												-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-	-
	Waterfowl	Canvasback	Wintering			100S												-	-	-	-
	Waterfowl	Mallard	Wintering			1,000S												-	-	-	-
	Waterfowl	Mergansers	Wintering			100S												-	-	-	-
	Waterfowl	Northern shoveler	Wintering			Present												-	-	-	-
	Waterfowl	Redhead	Wintering			100S												-	-	-	-
	Waterfowl	Ring-necked duck	Wintering			10S												-	-	-	-
	Waterfowl	Ruddy duck	Wintering			100S												-	-	-	-
	Waterfowl	Scaup	Wintering			10S												-	-	-	-
946	Waterfowl	Brant	Wintering			1,000S												-	-	-	-
	Waterfowl	Snow goose	Wintering			1,000S												-	-	-	-
	Waterfowl	Common loon	Wintering			Present												-	-	-	-
	Diving	Grebes	Wintering			10S												-	-	-	-
	Diving	Red-throated loon	Wintering			10S												-	-	-	-
	Pelagic	Northern gannet	Wintering			100S												-	-	-	-
	Waterfowl	American black duck	Wintering			100S												-	-	-	-
	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-	-
	Waterfowl	Gadwall	Wintering			10S												-	-	-	-
	Waterfowl	Long-tailed duck	Wintering			10S												-	-	-	-
1229	Waterfowl	Mallard	Wintering			10S												-	-	-	-
	Waterfowl	Mergansers	Wintering			100S												-	-	-	-
	Waterfowl	Scoters	Wintering			100S												-	-	-	-
	Diving	Common loon	Wintering			Present												-	-	-	-
	Diving	Grebes	Wintering			Present												-	-	-	-
	Diving	Red-throated loon	Wintering			Present												-	-	-	-
	Waterfowl	American black duck	Wintering			100S												-	-	-	-
	Waterfowl	Brant	Wintering			10S												-	-	-	-
	Waterfowl	Bufflehead	Wintering			100S												-	-	-	-
	Waterfowl	Mallard	Wintering			100S												-	-	-	-
	Waterfowl	Mergansers	Wintering			10S												-	-	-	-
	Waterfowl	Tundra swan	Wintering			Present												-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
1550	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-	-													-	-	-	-	Jan-Dec
1563	Marine Pelagic	Sandbar shark	Nursery Area																	-	-	-	May-Sep	May-Sep
	Diadromous	Alewife	Migration																	-	-	-	Aug-Nov	Feb-Apr
	Diadromous	Atlantic sturgeon	General Distribution	-/E	E	-	-													-	-	-	-	Jan-Dec
	Diadromous	Blueback herring	Migration																	-	-	-	Aug-Nov	Mar-Jun
	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-	-													-	-	-	Jan-Dec	Jan-Dec

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
1767	Turtle	Green sea turtle	General Distribution	T/T	T		Common													-	-	-	Jul-Oct	-
1768	Turtle	Green sea turtle	General Distribution	T/T	T		Rare													-	-	-	May-Dec*	-
	Turtle	Green sea turtle	General Distribution	T/T	T		Rare													-	-	-	May-Dec*	-
	Turtle	Green sea turtle	General Distribution	T/T	T		Common													-	-	-	Jul-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E		Uncommon													-	-	-	Nov-Dec	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E		Common													-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T		Abundant													-	-	-	Apr-Oct	Apr-Oct
	Turtle	Green sea turtle	General Distribution	T/T	T		Common													-	-	-	Nov-Dec	Nov-Dec
1775	Turtle	K. ridley sea turtle	General Distribution	E/E	E		Uncommon													-	-	-	Nov-Dec	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E		Common													-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T		Abundant													-	-	-	Apr-Oct	Apr-Oct
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T		Common													-	-	-	Nov-Dec	Nov-Dec
1778	Turtle	Green sea turtle	General Distribution	T/T	T		Rare													-	-	-	Jul-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	E		Rare													-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T		Common													-	-	-	May-Nov	May-Nov


INVERTEBRATES

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

MARINE MAMMALS





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

BIRDS



Subelement	Species	Mapping Qualifier	MDVA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	American wigeon	Wintering			100S													-	-	-	-
	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Canada goose	Wintering			1,000S													-	-	-	-
	Gadwall	Wintering			100S													-	-	-	-
	Green-winged teal	Wintering			100S													-	-	-	-
	Tundra swan	Wintering			100S													-	-	-	-

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS





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

FISH

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

Delmarva Peninsula: Map 72A


FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Black sea bass													-	-	-	Apr-Dec	Apr-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Winter flounder													-	-	-	-	Dec-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	-	Mar-Nov	Mar-Nov
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	-	Sep-May*
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	Jul-Nov	Mar-Nov







FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Butterfish													-	-	-	May-Oct	-
	Cobia													-	-	-	-	Jun-Sep
	Crevalle jack													-	-	-	Jun-Oct	-
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Lined seahorse													Jun-Sep	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep
	Spanish mackerel													-	-	-	-	May-Sep



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,433.59	2.24
10B	Freshwater Marshes	343.90	0.54
10C	Swamps	2,413.09	3.77
10D	Scrub and Shrub Wetlands	413.03	0.65
9A	Sheltered Tidal Flats	132.69	0.21

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	106,570.53	66.22	41%
10B	Freshwater Marshes	26.29	0.02	< 1%
10C	Swamps	9,503.00	5.90	4%
10D	Scrub and Shrub Wetlands	1,439.31	0.89	1%
9A	Sheltered Tidal Flats	108,485.30	67.41	42%
9B	Vegetated Low Banks	22,180.96	13.78	9%
8B	Sheltered, Solid Man-Made Structures	4,350.86	2.70	2%
8C	Sheltered Riprap	768.51	0.48	< 1%
7	Exposed Tidal Flats	276.08	0.17	< 1%
6A	Gravel Beaches	540.21	0.34	< 1%
3A	Fine to Medium Grained Sand Beaches	3,558.24	2.21	1%
3B	Scarps and Steep Slopes (Sand)	54.26	0.03	< 1%

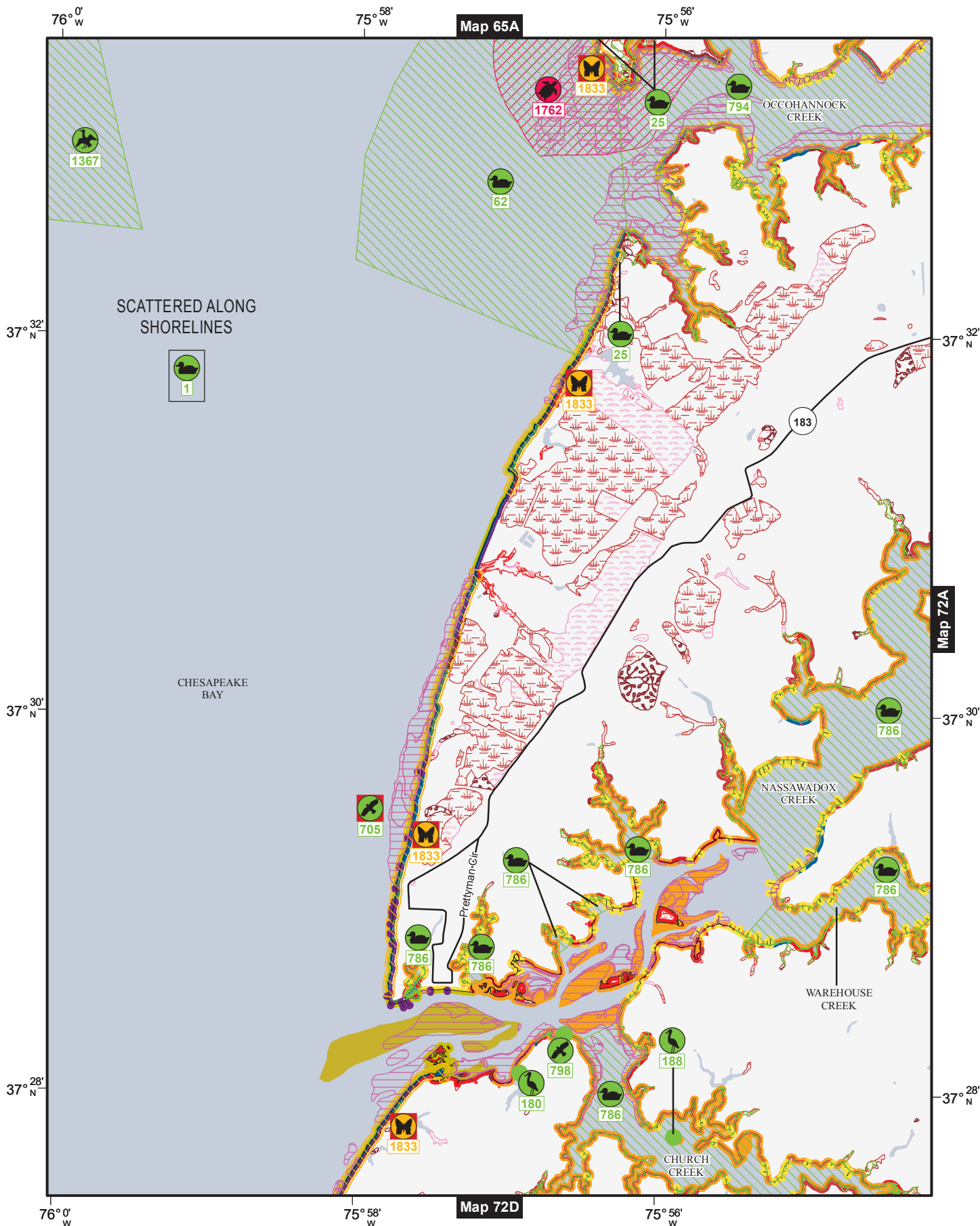
Total ESI Shoreline: 257,753.56
Total Shoreline: 113,026.25

Total ESI Shoreline: 160.16
Total Shoreline: 70.23

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 72B
Delmarva Peninsula



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

0 1 Miles
Not for Navigation
0 1 Kilometers

1:50,000



Map 72B
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence											
								J	F	M	A	M	J	J	A	S	O	N	D
1	Waterfowl	American black duck	Nesting				Present												
	Waterfowl	Canada goose	Nesting				Present												
	Waterfowl	Mallard	Nesting				Present												
25	Waterfowl	American black duck	Nesting				Present												
	Waterfowl	Blue-winged teal	Migration				100S												
	Waterfowl	Canada goose	Nesting				Present												
	Waterfowl	Green-winged teal	Wintering				100S												
	Waterfowl	Mallard	Nesting				Present												
	Waterfowl	Redhead	Wintering				100S												
	Waterfowl	Ring-necked duck	Wintering				10S												
62	Waterfowl	Redhead	Wintering				1,000S												
180	Wading	Great blue heron	Nesting				12 Nests												
188	Wading	Great blue heron	Nesting				24 Nests												
705	Raptor	Peregrine falcon	Nesting				-JT												
786	Waterfowl	Blue-winged teal	Migration				100S												
	Waterfowl	Canvasback	Wintering				10S												
	Waterfowl	Green-winged teal	Wintering				100S												
	Waterfowl	Ruddy duck	Wintering				1,000S												
	Waterfowl	Scaup	Wintering				100S												
794	Waterfowl	Blue-winged teal	Migration				100S												
	Waterfowl	Green-winged teal	Wintering				100S												
	Waterfowl	Redhead	Wintering				100S												
	Waterfowl	Ring-necked duck	Wintering				10S												
798	Raptor	Bald eagle	Nesting				1 Nest												
1367	Diving	D. crested cormorant	Wintering				1,000S												

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	Monthly Presence											
								J	F	M	A	M	J	J	A	S	O	N	D
1762	Turtle	Diamondback terrapin	Concentration Area				High												

INVERTEBRATES

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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

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

FISH

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



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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







ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

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

FISH

Monthly Presence







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

REPTILES & AMPHIBIANS



Monthly Presence

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	199.16	0.31
10B	Freshwater Marshes	313.66	0.49
10C	Swamps	1,028.55	1.61
10D	Scrub and Shrub Wetlands	100.54	0.16
9A	Sheltered Tidal Flats	150.98	0.24
7	Exposed Tidal Flats	150.23	0.23

ESI SHORELINE HABITAT TYPES

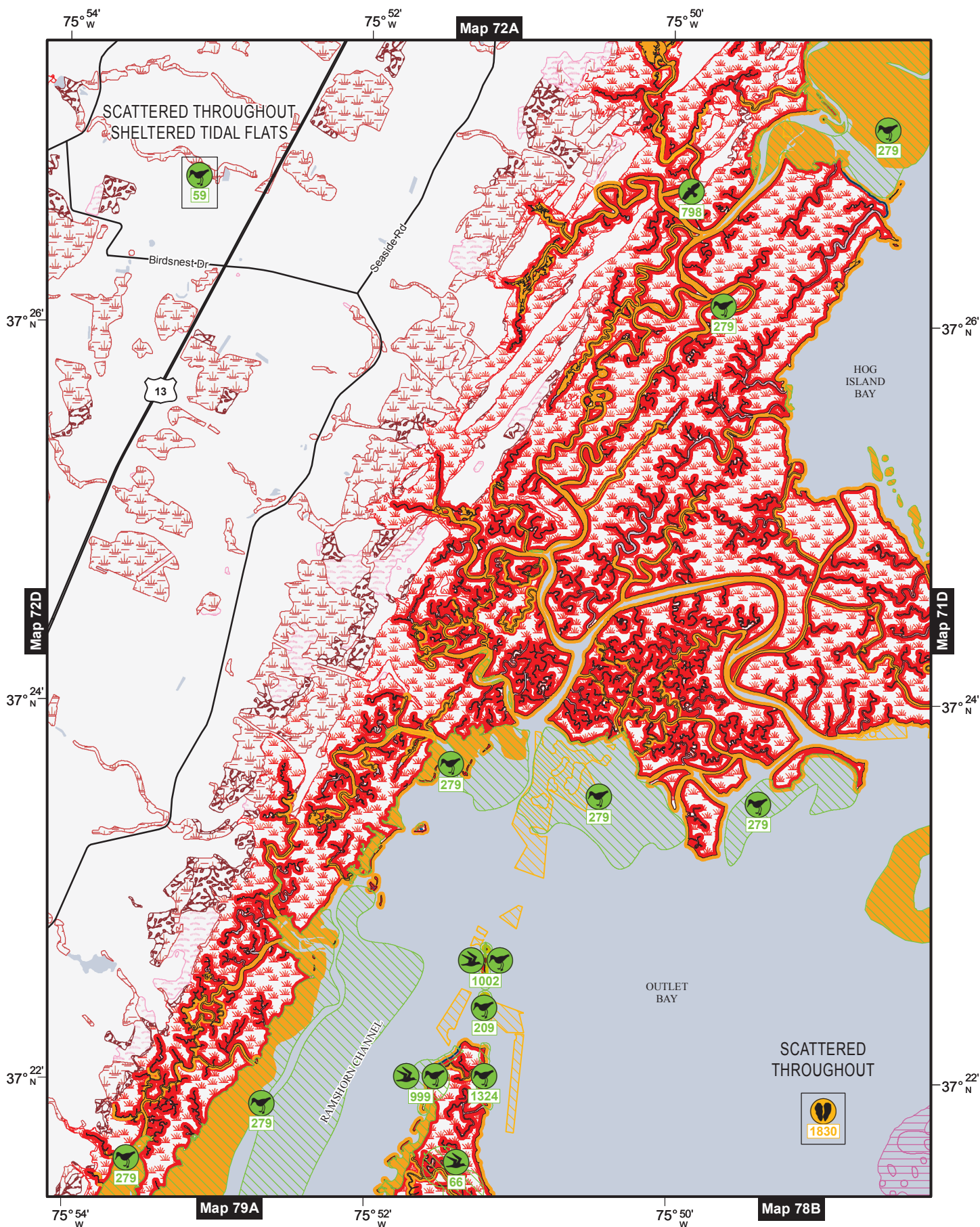
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	88,930.38	55.26	30%
10C	Swamps	10,120.91	6.29	3%
10D	Scrub and Shrub Wetlands	5,396.28	3.35	2%
9A	Sheltered Tidal Flats	85,499.89	53.13	29%
9B	Vegetated Low Banks	55,425.25	34.44	19%
8B	Sheltered, Solid Man-Made Structures	8,966.06	5.57	3%
8C	Sheltered Riprap	742.89	0.46	< 1%
7	Exposed Tidal Flats	17,072.78	10.61	6%
6B	Riprap	3,118.80	1.94	1%
3A	Fine to Medium Grained Sand Beaches	16,035.18	9.96	5%
3B	Scarps and Steep Slopes (Sand)	1,231.92	0.77	< 1%
1B	Exposed, Solid Man-Made Structures	2,408.83	1.50	1%

Total ESI Shoreline: 294,949.18 Total ESI Shoreline: 183.27
Total Shoreline: 110,426.80 Total Shoreline: 68.62

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

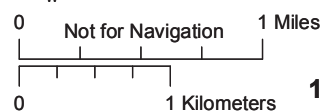




Map 72C
Delmarva Peninsula



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




Map 72C
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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	SAV	Submerged aquatic veg			Ephemeral																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														




BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
59	Shorebird	Shorebirds	Migration			Potential												-	May-Jun	Aug-Oct	-
66	Gull/Tern	Forster's tern	Nesting			34 Pairs												May-Jul	-	-	-
	Gull/Tern	Laughing gull	Nesting			4 Pairs												Apr-Aug	-	-	-
209	Shorebird	American oystercatcher	Nesting			-												Apr-Aug	-	-	-
279	Shorebird	Shorebirds	Migration			High												-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2												-	May-Jun	-	-
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-
999	Gull/Tern	G. black-backed gull	Nesting			24 Pairs												Apr-Jun	-	-	-
	Gull/Tern	Gulls	Nesting			-												Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting			-												May-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting			5 Pairs												Apr-Aug	-	-	-
1002	Gull/Tern	Gulls	Nesting			-												Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting			-												May-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting			2 Pairs												Apr-Aug	-	-	-
1324	Shorebird	American oystercatcher	Wintering			-												-	-	-	-
	Shorebird	American oystercatcher	Wintering			-												-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1830	Bivalve	Eastern oyster	Harvest Area			-												Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec


BIRDS

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

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Atlantic sturgeon			-													-	-	-	-	Jan-Dec
	Marine Pelagic	Sandbar shark			-													-	-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS

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

MARINE MAMMALS

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS




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

FISH

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

Delmarva Peninsula: Map 72C






FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Cleamose skate													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	May-Oct	-
	Crevalle jack													-	-	-	Jun-Oct	-
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep



REPTILES & AMPHIBIANS

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

INVERTEBRATES


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


MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES		
ESI Rank	Habitat Classification	Area (Sq. Miles)
 10A	Salt and Brackish Water Marshes	10.07
10B	Freshwater Marshes	0.46
10C	Swamps	2.36
10D	Scrub and Shrub Wetlands	0.64
9A	Sheltered Tidal Flats	1.41
7	Exposed Tidal Flats	0.00

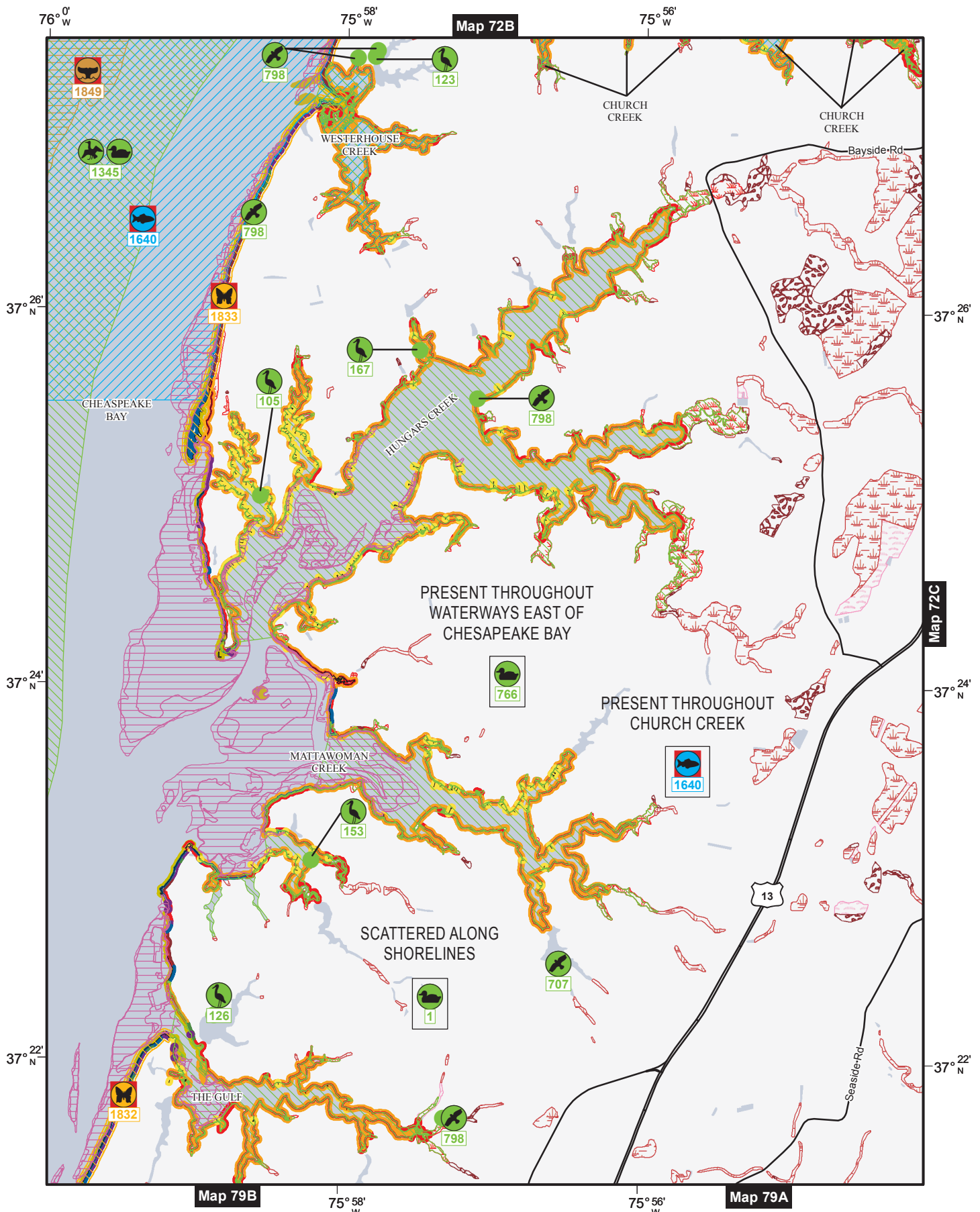
ESI SHORELINE HABITAT TYPES		
ESI Rank	Shoreline Habitat Classification	% of ESI Shoreline
 10A	Salt and Brackish Water Marshes	50%
10C	Swamps	< 1%
10D	Scrub and Shrub Wetlands	< 1%
9A	Sheltered Tidal Flats	50%
9B	Vegetated Low Banks	< 1%
8B	Sheltered, Solid Man-Made Structures	< 1%
7	Exposed Tidal Flats	< 1%
3A	Fine to Medium Grained Sand Beaches	< 1%

Total ESI Shoreline: 875,562.17 Total ESI Shoreline: 544.05
 Total Shoreline: 436,719.98 Total Shoreline: 271.37

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

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





Map 72D
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			
1	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug
105	Wading	Great blue heron	Nesting			13 Nests												Feb-Jun	-	-	-
123	Wading	Great blue heron	Nesting			14 Nests												Feb-Jun	-	-	-
126	Wading	Great blue heron	Nesting			3 Nests												Feb-Jun	-	-	-
153	Wading	Great blue heron	Nesting			4 Nests												Feb-Jun	-	-	-
167	Wading	Great blue heron	Nesting			8 Nests												Feb-Jun	-	-	-
707	Raptor	Bald eagle	Roosting			-												-	-	-	-
766	Waterfowl	American wigeon	Wintering			100S												-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S												-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead	Wintering			1,000S												-	-	-	-
	Waterfowl	Canvasback	Wintering			10S												-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S												-	-	-	-
	Waterfowl	Ruddy duck	Wintering			1,000S												-	-	-	-
	Waterfowl	Scaup	Wintering			100S												-	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-
1345	Diving	Grebes	Wintering			100S												-	-	-	-
	Waterfowl	Scoters	Wintering			10,000S												-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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1640	Diadromous	Shortnose sturgeon	General Distribution	E/E	E	-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D				
1832	Insect	NE beach tiger beetle	Concentration Area	E/T	T	High												Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-												Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug

MARINE MAMMALS




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D			

1849	Whale	Humpback whale	General Distribution	E/E	E	Very Rare													-	-	-	-
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WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)




BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				


	Diving	Common loon	Wintering			100S												-	-	-	-
		D. crested cormorant	Wintering			100S												-	Mar-May	Aug-Nov	-
		Grebes	Wintering			Present												-	-	-	-
	Pelagic	Red-throated loon	Wintering			100S												-	-	-	-
		Northern gannet	Wintering			100S												-	-	-	-
		American black duck	Wintering			100S												-	-	-	-
	Waterfowl	American wigeon	Wintering			10S												-	-	-	-
		Blue-winged teal	Migration			10S												-	Feb-Apr	Aug-Oct	-
		Brant	Wintering			10S												-	-	-	-
		Bufflehead	Wintering			100S												-	-	-	-
		Canada goose	Wintering			1,000S												-	-	-	-
		Common goldeneye	Wintering			Present												-	-	-	-
		Gadwall	Wintering			100S												-	-	-	-
		Green-winged teal	Wintering			10S												-	-	-	-
		Long-tailed duck	Wintering			Present												-	-	-	-
		Mallard	Wintering			100S												-	-	-	-
		Mergansers	Wintering			100S												-	-	-	-
		Ring-necked duck	Wintering			100S												-	-	-	-
		Ruddy duck	Wintering			100S												-	-	-	-
		Scaup	Wintering			10S												-	-	-	-
		Scoters	Wintering			1,000S												-	-	-	-
		Snow goose	Wintering			100S												-	-	-	-
		Tundra swan	Wintering			100S												-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					

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

REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS



Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
			S	F	Concentration															
		General Distribution	-/E	E	Rare															

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican														-	-	-
	Brown pelican														-	-	-
	D. crested cormorant														-	-	-
	Gulls														-	-	-
	Terns														-	-	-
	Storm-petrels														-	-	-
	Wood duck														Apr-Jul	-	Jul-Aug

FISH

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

Delmarva Peninsula: Map 72D

FISH (continued)

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

REPTILES & AMPHIBIANS



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

INVERTEBRATES



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

Delmarva Peninsula: Map 72D

INVERTEBRATES (continued)

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	405.39	0.63
10B	Freshwater Marshes	61.26	0.10
10C	Swamps	641.92	1.00
10D	Scrub and Shrub Wetlands	196.51	0.31
9A	Sheltered Tidal Flats	15.37	0.02
7	Exposed Tidal Flats	18.71	0.03

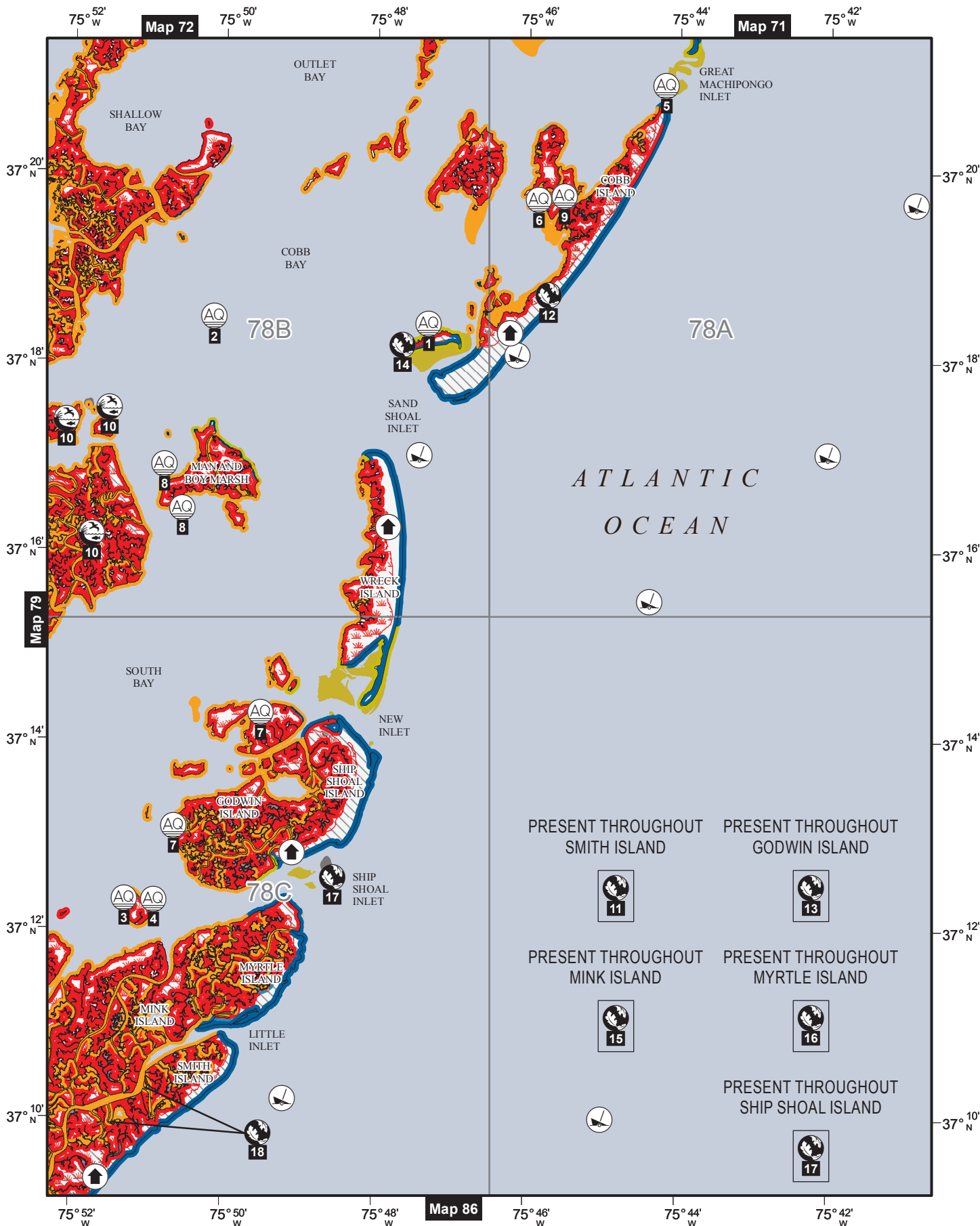
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	106,183.64	65.98	33%
10C	Swamps	911.56	0.57	< 1%
10D	Scrub and Shrub Wetlands	3,835.64	2.38	1%
9A	Sheltered Tidal Flats	101,655.16	63.17	31%
9B	Vegetated Low Banks	72,471.85	45.03	22%
8B	Sheltered, Solid Man-Made Structures	6,801.38	4.23	2%
8C	Sheltered Riprap	358.01	0.22	< 1%
7	Exposed Tidal Flats	14,273.11	8.87	4%
6B	Riprap	1,590.37	0.99	< 1%
4	Coarse Grained Sand Beaches	137.78	0.09	< 1%
3A	Fine to Medium Grained Sand Beaches	12,387.32	7.70	4%
3B	Scarps and Steep Slopes (Sand)	334.48	0.21	< 1%
1B	Exposed, Solid Man-Made Structures	3,315.52	2.06	1%
Total ESI Shoreline:		324,255.82	Total ESI Shoreline: 201.48	
		122,592.66	Total Shoreline: 76.18	

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

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

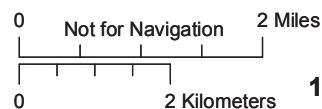




Map 78
Delmarva Peninsula



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



1:100,000



Map 78
Delmarva Peninsula

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	AQUACULTURE	HARD CLAMS BALLARD RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
2	AQUACULTURE	HARD CLAMS BELL RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
3	AQUACULTURE	HARD CLAMS BULL RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
4	AQUACULTURE	HARD CLAMS JONES RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
5	AQUACULTURE	HARD CLAMS MARINER RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
6	AQUACULTURE	HARD CLAMS MARINER, ROGER RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
7	AQUACULTURE	HARD CLAMS R&C (CHURN) RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
8	AQUACULTURE	HARD CLAMS UNKNOWN (BAYLOR GROUND?) RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
9	AQUACULTURE	VARIOUS MARINER, J. ROGER RF#95-1430	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
10	MANAGEMENT AREA	MOCKHORN WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES	
11	NATURE CONSERVANCY	CEDAR ISLAND MACROSITE	THE NATURE CONSERVANCY	703-841-5300
12	NATURE CONSERVANCY	COBB ISLAND	THE NATURE CONSERVANCY	703-841-5300
13	NATURE CONSERVANCY	GODWIN ISLAND	THE NATURE CONSERVANCY	703-841-5300
14	NATURE CONSERVANCY	LITTLE COBB ISLAND	THE NATURE CONSERVANCY	703-841-5300
15	NATURE CONSERVANCY	MINK ISLAND	THE NATURE CONSERVANCY	703-841-5300
16	NATURE CONSERVANCY	MYRTLE ISLAND	THE NATURE CONSERVANCY	703-841-5300
17	NATURE CONSERVANCY	SHIP SHOAL ISLAND	THE NATURE CONSERVANCY	703-841-5300
18	NATURE CONSERVANCY	SMITH ISLAND	THE NATURE CONSERVANCY	703-841-5300

ALSO PRESENT IN MAPPED AREA (POLYGONS)				
Type	Name	Contact	Phone	
STATE PROTECTED AREA	TIDAL LANDS	VA MARINE RESOURCES COMMISSION		
STATE PROTECTED AREA	WRECK ISLAND	VA DEPT OF CONSERVATION AND RECREATION		

JURISDICTIONS				
COUNTY:	NORTHAMPTON COUNTY			
COAST GUARD:	DISTRICT 5, SECTOR HAMPTON ROADS			
USACE:	NORTH ATLANTIC DIVISION, NORFOLK DISTRICT			
		FEMA:	REGION 1	
		EPA:	REGION 3	

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	8,957.32	14.00
10D	Scrub and Shrub Wetlands	1.25	0.00
9A	Sheltered Tidal Flats	428.31	0.67
7	Exposed Tidal Flats	402.76	0.63



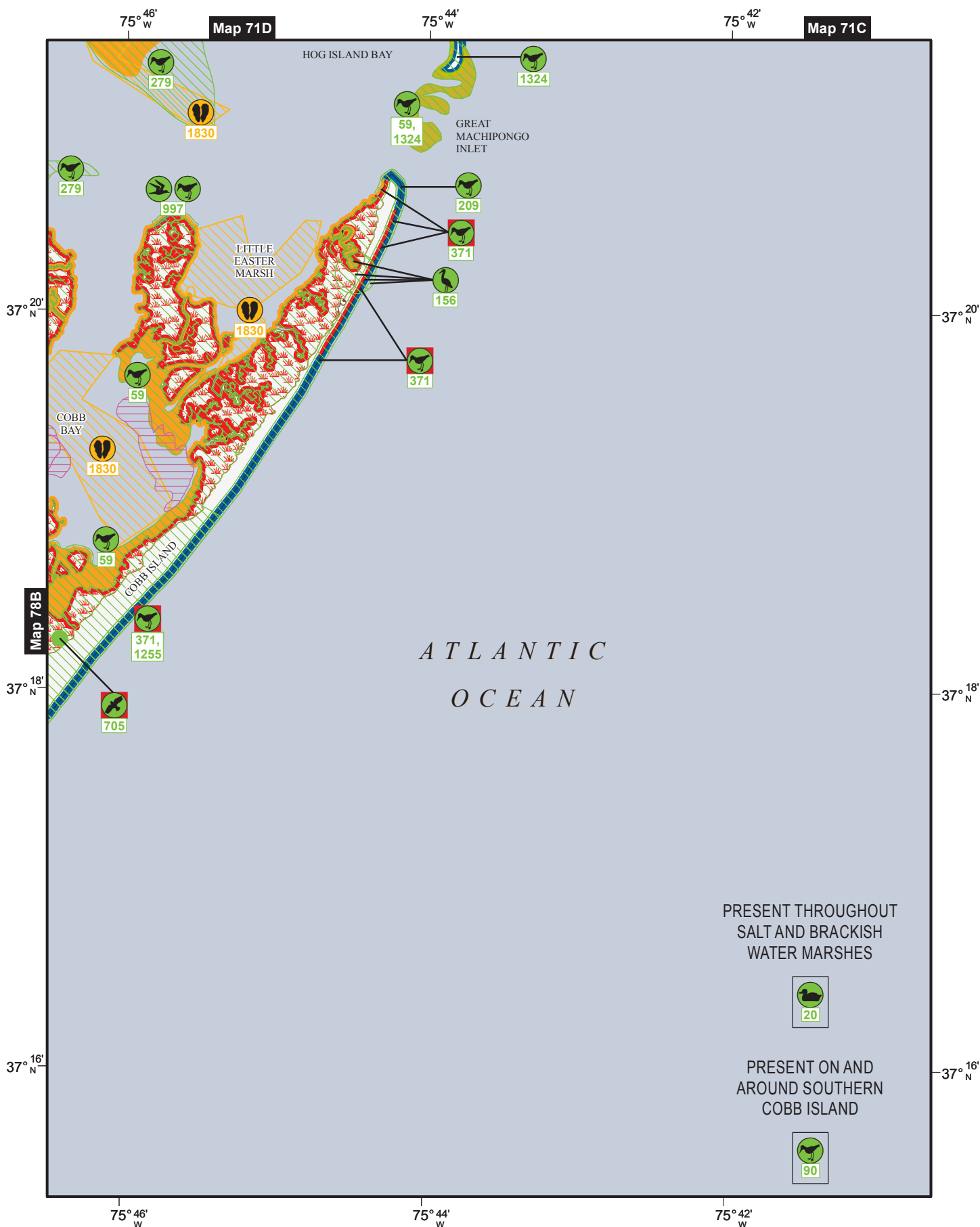
ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	888,173.44	551.89	49%
9A	Sheltered Tidal Flats	874,775.37	543.56	48%
7	Exposed Tidal Flats	11,966.58	7.44	1%
5	Mixed Sand and Gravel Beaches	315.61	0.20	< 1%
4	Coarse Grained Sand Beaches	570.86	0.35	< 1%
3A	Fine to Medium Grained Sand Beaches	46,535.11	28.92	3%
Total ESI Shoreline:		1,822,336.97	1,132.35	
Total Shoreline:		923,689.55	573.95	

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 78A
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
							J	F	M	A	M	J	J	A	S	O	N	D				
20	Waterfowl	American black duck	Nesting			Present													Apr-Jul	-	-	-
	Waterfowl	American black duck	Wintering			1,000S													-	-	-	-
	Waterfowl	American wigeon	Wintering			100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canada goose	Nesting			Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering			100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S													-	-	-	-
	Waterfowl	Mallard	Nesting			Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering			100S													-	-	-	-
	Waterfowl	Northern pintail	Wintering			10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering			10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering			100S													-	-	-	-
59	Shorebird	Shorebirds	Migration			Potential													-	May-Jun	Aug-Oct	-
90	Shorebird	American oystercatcher	Nesting			4 Pairs													Apr-Aug	-	-	-
156	Wading	American oystercatcher	Roosting			3 Pairs													-	-	-	-
	Wading	Great egret	Nesting			38 Nests													Apr-Aug	-	-	-
	Wading	Little blue heron	Nesting			2 Pairs													Apr-Aug	-	-	-
	Wading	Snowy egret	Nesting			20 Pairs													Apr-Aug	-	-	-
	Wading	Tricolored heron	Nesting			18 Pairs													May-Aug	-	-	-
209	Shorebird	American oystercatcher	Nesting			-													Apr-Aug	-	-	-
279	Shorebird	Shorebirds	Migration			High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2													-	May-Jun	-	-
371	Shorebird	Dunlin	Migration			100S													-	Apr-May	Oct-Nov	-
	Shorebird	Red knot	Migration	T/T	T	Up To 81 Birds/Km													-	Apr-Jun	Jul-Oct	-
705	Raptor	Peregrine falcon	Nesting	-/T		-													Feb-Jun	-	-	-
997	Gull/Tern	Gulls	Nesting			-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting			-													May-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting			3 Pairs													Apr-Aug	-	-	-
1255	Shorebird	Piping plover	Nesting	E/T	T	1-4 Nests													Apr-Aug	-	-	-
	Shorebird	Wilson's plover	Nesting	E/E		1 Nest													Apr-Aug	-	-	-
1324	Shorebird	American oystercatcher	Wintering			-													-	-	-	-







Delmarva Peninsula: Map 78A

INVERTEBRATES



Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D	Spawn																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
1830	Bivalve	Eastern oyster	Harvest Area			-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Alcid	Wintering			Present													-	-	-	-
	Diving	Wintering			100S													-	-	-	-
	Common loon	Wintering			Present													-	-	-	-
	D. crested cormorant	Wintering			1,000S													-	Mar-May	Aug-Nov	-
	Grebes	Wintering			10S													-	-	-	-
	Red-throated loon	Wintering			100S													-	-	-	-
	Red-throated loon	Wintering			10S													-	-	-	-
	Northern gannet	Wintering			1,000S													-	-	-	-
	Northern gannet	Wintering			100S													-	-	-	-
	American black duck	Wintering			100S													-	-	-	-
	Brant	Wintering			1,000S													-	-	-	-
	Bufflehead	Wintering			1,000S													-	-	-	-
	Canada goose	Wintering			1,000S													-	-	-	-
	Gadwall	Wintering			10S													-	-	-	-
	Long-tailed duck	Wintering			10S													-	-	-	-
	Long-tailed duck	Wintering			Present													-	-	-	-
	Mallard	Wintering			10S													-	-	-	-
	Mergansers	Wintering			100S													-	-	-	-
	Red-breasted merganser	Wintering			Present													-	-	-	-
	Scoters	Wintering			1,000S													-	-	-	-
	Scoters	Wintering			100S													-	-	-	-
	Snow goose	Wintering			1,000S													-	-	-	-



FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Migration			-													-	-	-	-	Sep-Dec
	Atlantic sturgeon	General Distribution	-JE	E	-													-	-	-	-	Jan-Dec
	Sandbar shark	Nursery Area			-													-	-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS

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

MARINE MAMMALS


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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS




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

FISH


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

Delmarva Peninsula: Map 78A

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Hickory shad													-	-	-	Feb-Sep	Feb-Sep
	Hickory shad													-	-	-	Jun-Oct	Feb-Jun
	Striped bass													-	-	-	-	Jan-Dec
	Striped bass													-	-	-	May-Oct	Jan-Dec
	Atl. sharpnose shark													-	-	-	-	May-Oct
	Atlantic croaker													-	-	-	Aug-Dec	May-Nov
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	Feb-Jun	Feb-Jun
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Atlantic menhaden													-	-	-	Jan-Dec	May-Oct
	Black drum													-	-	-	-	Apr-Oct
	Black drum													-	-	-	May-Oct	Jan-Dec
	Black sea bass													-	-	-	Apr-Dec	Apr-Dec
	Black sea bass													Jun-Oct	-	-	Apr-Oct	Apr-Oct
	Bluefish													-	-	-	May-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													Apr-Sep	-	-	-	Apr-Oct
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	-	Jan-Dec
	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Great hammerhead													-	-	-	-	May-Oct
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleamose skate													-	-	-	-	Jan-Dec








FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern searobin													-	-	-	-	Mar-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Tautog													-	-	-	Jan-Dec	Jan-Dec
 Marine Pelagic	Atlantic mackerel													-	-	-	-	Mar-Apr
	Blacktip shark													-	-	-	-	May-Oct
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Butterfish													-	-	-	May-Oct	-
	Crevalle jack													-	-	-	Jun-Oct	-
	Dusky shark													-	-	-	-	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep
	Scalloped hammerhead													-	-	-	May-Oct	May-Oct
	Spanish mackerel													-	-	-	-	May-Sep
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	Nov-May	Nov-May
	Thresher shark													-	-	-	-	May-Sep



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	686.29	1.07
10D	Scrub and Shrub Wetlands	1.25	0.00
9A	Sheltered Tidal Flats	197.70	0.31
7	Exposed Tidal Flats	66.90	0.10



ESI SHORELINE HABITAT TYPES

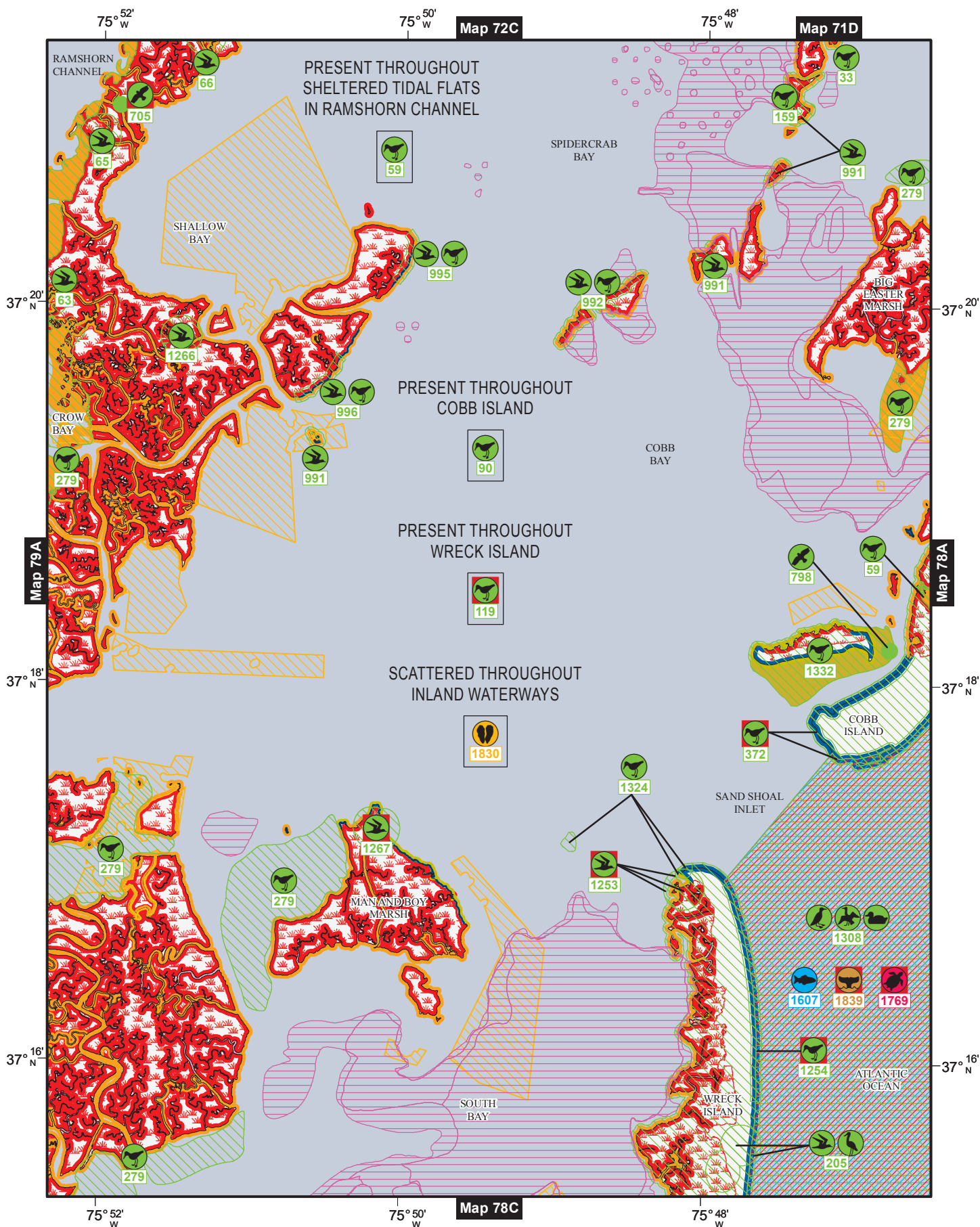
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	53,851.66	33.46	47%
9A	Sheltered Tidal Flats	52,118.96	32.39	46%
7	Exposed Tidal Flats	794.96	0.49	1%
5	Mixed Sand and Gravel Beaches	315.61	0.20	< 1%
3A	Fine to Medium Grained Sand Beaches	7,358.88	4.57	6%

Total ESI Shoreline: 114,440.08 Total ESI Shoreline: 71.11
 Total Shoreline: 59,538.95 Total Shoreline: 37.00

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

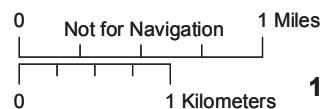




Map 78B
Delmarva Peninsula



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



1:50,000

Map 78B
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
33	Shorebird	American oystercatcher	Nesting			1 Pair												Apr-Aug	-	-	-	
59	Shorebird	Shorebirds	Migration			Potential												-	May-Jun	Aug-Oct	-	
63	Gull/Tern	Forster's tern	Nesting			16 Pairs												May-Jul	-	-	-	
65	Gull/Tern	Laughing gull	Nesting			28 Pairs												Apr-Aug	-	-	-	
66	Gull/Tern	Forster's tern	Nesting			34 Pairs												May-Jul	-	-	-	
	Gull/Tern	Laughing gull	Nesting			4 Pairs												Apr-Aug	-	-	-	
90	Shorebird	American oystercatcher	Nesting			4 Pairs												Apr-Aug	-	-	-	
	Shorebird	American oystercatcher	Roosting			3 Pairs												-	-	-	-	
119	Shorebird	American oystercatcher	Nesting			32 Pairs												Apr-Aug	-	-	-	
	Shorebird	American oystercatcher	Roosting			3 Pairs												-	-	-	-	
	Shorebird	Black-bellied plover	Migration			100S												-	May-Jun	Sep-Dec	-	
	Shorebird	Dunlin	Migration			100S												-	Apr-May	Oct-Nov	-	
	Shorebird	Red knot	Migration	T/T	T	Up To 139 Birds/Km												-	Apr-Jun	Jul-Oct	-	
	Shorebird	Sanderling	Migration			100S												-	May-Jun	Aug-Oct	-	
	Shorebird	Semipalmated plover	Migration			100S												-	Apr-Jun	Jul-Nov	-	
	Shorebird	Willet	Migration			100S												-	May	Jul	-	
159	Shorebird	American oystercatcher	Nesting			2 Pairs												Apr-Aug	-	-	-	
205	Gull/Tern	G. black-backed gull	Nesting			259 Pairs												Apr-Jun	-	-	-	
	Gull/Tern	Herring gull	Nesting			357 Pairs												May-Aug	-	-	-	
	Wading	BC night-heron	Nesting			47 Pairs												Apr-Aug	-	-	-	
	Wading	Glossy ibis	Nesting			159 Pairs												May-Jul	-	-	-	
	Wading	Great egret	Nesting			140 Nests												Apr-Aug	-	-	-	
	Wading	Little blue heron	Nesting			34 Pairs												Apr-Aug	-	-	-	
	Wading	Snowy egret	Nesting			155 Pairs												Apr-Aug	-	-	-	
	Wading	Tricolored heron	Nesting			266 Pairs												May-Aug	-	-	-	
	Wading	White ibis	Nesting			356 Pairs												Jun-Jul	-	-	-	
279	Shorebird	Shorebirds	Migration			High												-	May-Jun	Aug-Oct	-	
	Shorebird	Whimbrel	Migration			222 Birds/Km2												-	May-Jun	-	-	
372	Shorebird	Dunlin	Migration	E/T	T	100S												-	Apr-May	Oct-Nov	-	
	Shorebird	Piping plover	Nesting			1-4 Nests												Apr-Aug	-	-	-	

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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FISH

Map ID	Subelement	Species	Mapping Qualifier	MDVA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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REPTILES & AMPHIBIANS

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

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1830	Bivalve	Eastern oyster	Harvest Area			-												Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
1839	Whale	Fin whale	General Distribution	E/E	E	Common												-	-	-	-
	Whale	Humpback whale	General Distribution	E/E	E	Uncommon												-	-	-	-
	Whale	Humpback whale	General Distribution	E/E	E	Common												-	-	-	-
	Whale	N.A. right whale	General Distribution	E/E	E	Rare												-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)



BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Diving	Common loon	Wintering			Present												-	-	-	-
		Grebes	Wintering			10S												-	-	-	-
	Pelagic	Red-throated loon	Wintering			10S												-	-	-	-
		Northern gannet	Wintering			100S												-	-	-	-
	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-
		American black duck	Wintering			1,000S												-	-	-	-
		American black duck	Wintering			100S												-	-	-	-
		American wigeon	Wintering			100S												-	-	-	-
		Blue-winged teal	Migration			100S												-	Feb-Apr	Aug-Oct	-
		Brant	Wintering			1,000S												-	-	-	-
		Bufflehead	Wintering			1,000S												-	-	-	-
		Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul
		Canada goose	Wintering			1,000S												-	-	-	-
		Gadwall	Wintering			100S												-	-	-	-
		Gadwall	Wintering			10S												-	-	-	-
		Green-winged teal	Wintering			100S												-	-	-	-
		Long-tailed duck	Wintering			10S												-	-	-	-


BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Nest	Eggs	Larvae	Juveniles	Molt
						J	F	M	A	M	J	J	A	S	O	N	D					
		Mallard	Nesting		Present													Mar-Aug				Jul-Aug
		Mallard	Wintering		10S																	
		Mallard	Wintering		100S																	
		Mergansers	Wintering		100S																	
		Northern pintail	Wintering		10S																	
		Northern shoveler	Wintering		10S																	
		Scoters	Wintering		100S																	
		Snow goose	Wintering		1,000S																	
		Tundra swan	Wintering		100S																	

FISH

Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
					J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Atlantic sturgeon		-																	Jan-Dec
	Marine Pelagic	Sandbar shark		-																	May-Sep

REPTILES & AMPHIBIANS







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

MARINE MAMMALS

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

BIRDS

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



FISH

Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Alewife													-	-	-	Apr-May	Mar-Jun
	Alewife													-	-	-	Aug-Nov	Feb-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	Aug-Nov	Apr-Jun
	American shad													-	-	-	Aug-Nov	Feb-Jul
	Blueback herring													-	-	-	Apr-Oct	Apr-Jun
	Blueback herring													-	-	-	Aug-Nov	Feb-Jul
	Hickory shad													-	-	-	Feb-Sep	Feb-Sep
	Hickory shad													-	-	-	Jun-Oct	Feb-Jun
	Striped bass													-	-	-	May-Oct	Jan-Dec
	Striped bass													-	-	-	-	Jan-Dec
	Atl. sharpnose shark													-	-	-	-	May-Oct
	Atlantic croaker													-	-	-	Aug-Dec	May-Nov
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	Feb-Jun	Feb-Jun
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Atlantic menhaden													-	-	-	Jan-Dec	May-Oct
	Black drum													-	-	-	May-Oct	Jan-Dec
	Black drum													-	-	-	-	Apr-Oct
	Black sea bass													Jun-Oct	-	-	Apr-Oct	Apr-Oct
	Black sea bass													-	-	-	Apr-Dec	Apr-Dec
	Bluefish													-	-	-	May-Oct	May-Oct
	Bluefish													-	-	-	May-Nov	Apr-Nov
	Kingfishes													Apr-Sep	-	-	-	Apr-Oct
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	-	Jan-Dec
	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec

Delmarva Peninsula: Map 78B







FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Anchovies													-	-	-	-	May-Nov
	Great hammerhead													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Striped burrfish													-	-	-	-	May-Oct
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	May-Oct
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	-	Apr-Oct
	Northern searobin													-	-	-	-	Mar-Oct
	Northern stargazer													-	-	-	-	Apr-Nov
	Red hake													-	-	-	-	Feb-May
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	-	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	-	Mar-Jun
	Spotted hake													-	-	-	-	Oct-Jun
	Striped cusk-eel													-	-	-	-	May-Oct
	Tautog													-	-	-	-	-
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Atlantic mackerel													-	-	-	-	Jan-Dec
	Blacktip shark													-	-	-	-	Mar-Apr
	Butterfish													-	-	-	-	May-Oct
	Butterfish													-	-	-	-	May-Oct
	Crevalle jack													-	-	-	-	Jul-Nov
	Dusky shark													-	-	-	-	Jun-Oct
	Great white shark													-	-	-	-	May-Oct
	Lined seahorse													Jun-Sep	Jun-Sep	-	-	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	-	May-Oct
	Scalloped hammerhead													-	-	-	-	May-Oct
	Scalloped hammerhead													-	-	-	-	May-Sep
	Spanish mackerel													-	-	-	-	May-Oct
	Spinner shark													-	-	-	-	May-Sep
	Spiny dogfish													-	-	-	-	May-Oct
	Thresher shark													-	-	-	-	Nov-May
														-	-	-	-	May-Sep
														-	-	-	-	-
														-	-	-	-	-



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	3,534.81	5.52
9A	Sheltered Tidal Flats	211.47	0.33
7	Exposed Tidal Flats	115.49	0.18



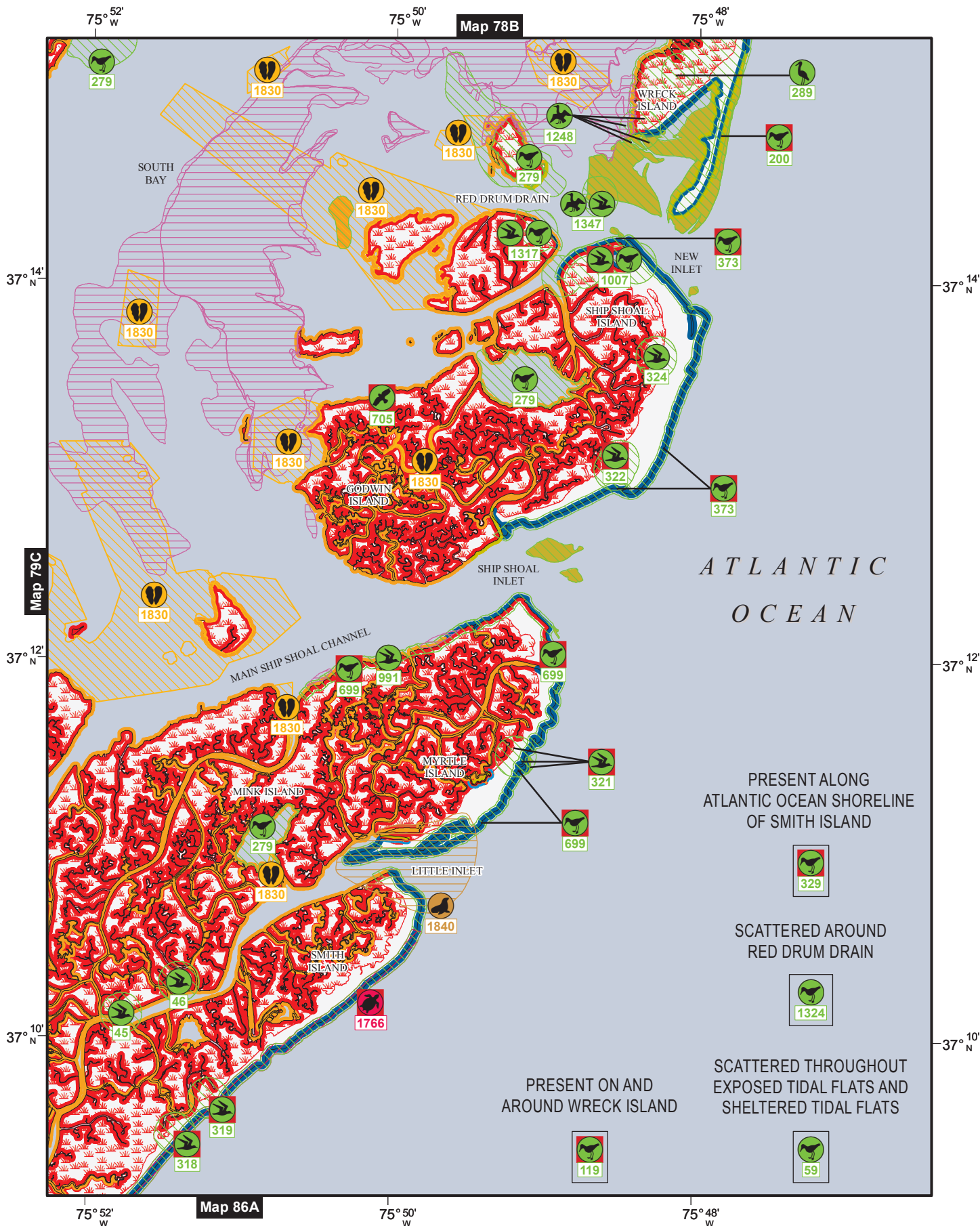
ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	367,496.53	228.35	49%
9A	Sheltered Tidal Flats	363,293.43	225.74	48%
7	Exposed Tidal Flats	5,818.21	3.62	1%
3A	Fine to Medium Grained Sand Beaches	14,013.60	8.71	2%
Total ESI Shoreline:		750,621.77	466.41	
Total Shoreline:		376,886.03	234.19	

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

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

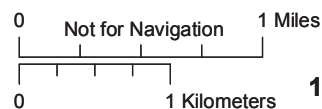




Map 78C
Delmarva Peninsula



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



1:50,000



Map 78C
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence											
								J	F	M	A	M	J	J	A	S	O	N	D
45	Gull/Tern	Forster's tern	Nesting				12 Pairs												
46	Gull/Tern	Forster's tern	Nesting				32 Pairs												
59	Shorebird	Shorebirds	Migration				Potential												
119	Shorebird	American oystercatcher	Nesting				32 Pairs												
	Shorebird	American oystercatcher	Roosting				3 Pairs												
	Shorebird	Black-bellied plover	Migration				100S												
	Shorebird	Dunlin	Migration				100S												
	Shorebird	Red knot	Migration				Up To 139 Birds/Km												
	Shorebird	Sanderling	Migration				100S												
	Shorebird	Semipalmated plover	Migration				100S												
	Shorebird	Willet	Migration				100S												
200	Shorebird	Piping plover	Nesting				-												
279	Shorebird	Shorebirds	Migration				High												
289	Wading	BC night-heron	Nesting				170 Pairs												
	Wading	Great egret	Nesting				46 Nests												
	Wading	Snowy egret	Nesting				10 Pairs												
	Wading	Tricolored heron	Nesting				75 Pairs												
	Wading	YC night-heron	Nesting				2 Pairs												
318	Gull/Tern	Least tern	Nesting				23 Pairs												
319	Gull/Tern	Least tern	Nesting				4 Pairs												
321	Gull/Tern	Least tern	Nesting				13 Pairs												
322	Gull/Tern	Black skimmer	Nesting				299 Pairs												
	Gull/Tern	Common tern	Nesting				146 Pairs												
	Gull/Tern	Least tern	Nesting				58 Pairs												
	Gull/Tern	Royal tern	Nesting				23 Pairs												
	Gull/Tern	Sandwich tern	Nesting				5 Pairs												
324	Gull/Tern	G. black-backed gull	Nesting				45 Pairs												
	Gull/Tern	Herring gull	Nesting				148 Pairs												
329	Shorebird	American oystercatcher	Nesting				24 Pairs												

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Juveniles	Molt
	Shorebird	American oystercatcher	Roosting				2 Pairs													-	-	-	-	-
	Shorebird	Dunlin	Migration				1000S													-	Apr-May	Oct-Nov	-	-
	Shorebird	Red knot	Migration				Up To 68 Birds/Km													-	Apr-Jun	Jul-Oct	-	-
	Shorebird	Ruddy turnstone	Migration				100S													-	May	Aug	-	-
	Shorebird	Sanderling	Migration				100S													-	May-Jun	Aug-Oct	-	-
	Shorebird	Western sandpiper	Migration				100S													-	Mar	Sep-Oct	-	-
	Shorebird	Willet	Migration				100S													-	May	Jul	-	-
373	Shorebird	American oystercatcher	Nesting				41 Nests													Apr-Aug	-	-	-	-
	Shorebird	American oystercatcher	Roosting				4 Pairs													-	-	-	-	-
	Shorebird	Dunlin	Migration				100S													-	Apr-May	Oct-Nov	-	-
	Shorebird	Piping plover	Nesting				1-8 Nests													Apr-Aug	-	-	-	-
	Shorebird	Red knot	Migration				Up To 52 Birds/Km													-	Apr-Jun	Jul-Oct	-	-
	Shorebird	Wilson's plover	Nesting				2 Nests													Apr-Aug	-	-	-	-
699	Shorebird	Dunlin	Migration				1000S													-	Apr-May	Oct-Nov	-	-
	Shorebird	Piping plover	Nesting				1-6 Nests													Apr-Aug	-	-	-	-
	Shorebird	Red knot	Migration				Up To 73 Birds/Km													-	Apr-Jun	Jul-Oct	-	-
	Shorebird	Wilson's plover	Nesting				1-3 Nests													Apr-Aug	-	-	-	-
705	Raptor	Peregrine falcon	Nesting				-													Feb-Jun	-	-	-	-
991	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-	-
	Gull/Tern	Terns	Nesting				-													May-Aug	-	-	-	-
1007	Gull/Tern	Black skimmer	Nesting				69 Pairs													May-Sep	-	-	-	-
	Gull/Tern	Common tern	Nesting				4 Pairs													May-Aug	-	-	-	-
	Gull/Tern	Gull-billed tern	Nesting				5 Pairs													May-Jul	-	-	-	-
	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-	-
	Gull/Tern	Royal tern	Nesting				16 Pairs													May-Aug	-	-	-	-
	Shorebird	American oystercatcher	Wintering				-													-	-	-	-	-
1248	Diving	Brown pelican	Nesting				360 Pairs													Apr-Aug	-	-	-	-
1317	Gull/Tern	Common tern	Nesting				73 Pairs													May-Aug	-	-	-	-
	Gull/Tern	Forster's tern	Nesting				10 Pairs													May-Jul	-	-	-	-
	Gull/Tern	Gull-billed tern	Nesting				120 Pairs													May-Jul	-	-	-	-
	Shorebird	American oystercatcher	Nesting				5 Pairs													Apr-Aug	-	-	-	-
1324	Shorebird	American oystercatcher	Wintering				-													-	-	-	-	-
1347	Diving	Brown pelican	Nesting				36 Pairs													Apr-Aug	-	-	-	-
	Gull/Tern	G. black-backed gull	Nesting				11 Pairs													Apr-Jun	-	-	-	-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MDVA				Monthly Presence															
				S	F	T	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Hatch	Internest	Juveniles
1766	Turtle	Loggerhead sea turtle	Nesting				0-1 Nest												May-Aug	Jun-Oct	-	Jun-Oct	May-Aug

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1830	Bivalve	Eastern oyster	Harvest Area				-													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec





Delmarva Peninsula: Map 78C

MARINE MAMMALS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Mating	Calving	Pupping	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
1840	Pinniped	Gray seal	Haul Out			-												-	-	-	-
	Pinniped	Harbor seal	Haul Out			60 Seals												-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)



BIRDS

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


BIRDS (continued)

Map ID	Subelement	Species	MDVA		Mapping Qualifier	MDVA		Monthly Presence												Nest	Eggs	Larvae	Mig.(S)	Mig.(F)	Molt
			S	F		S	F	J	F	M	A	M	J	J	A	S	O	N	D						
		Scoters			Wintering															-					-
		Scoters			Wintering															-					-
		Snow goose			Wintering															-					-
		Tundra swan			Wintering															-					-



FISH

Subelement	Species	MDVA		Mapping Qualifier	MDVA		Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		S	F		S	F	J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous			Migration															-				Sep-Dec
	Atlantic sturgeon			General Distribution	-/E	E													-				Jan-Dec
	Marine Pelagic			Nursery Area															-				May-Sep






REPTILES & AMPHIBIANS

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



MARINE MAMMALS

Subelement	Species	MDVA		Mapping Qualifier	MDVA		Monthly Presence												Mating	Calving	Pupping	Molt
		S	F		S	F	J	F	M	A	M	J	J	A	S	O	N	D				
	Manatee			General Distribution	-/E	E													-			-
	Whale			General Distribution	E/E	E													-			-
	Humpback whale			General Distribution	E/E	E													-			-
	Humpback whale			General Distribution	E/E	E													-			-
	N.A. right whale			General Distribution	E/E	E													-			-

BIRDS

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

FISH

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

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
Estuarine Resident	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Spot													-	-	-	Apr-Nov	Jul-Sep
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
Fish	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Winter flounder													-	-	-	Jan-Dec	Feb-Mar
	Killifish													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	Jan-Dec	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Great hammerhead													-	-	-	-	May-Oct
Marine Benthic	Striped burrfish													-	-	-	May-Oct	May-Oct
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Clearnose skate													-	-	-	-	Jan-Dec
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern searobin													-	-	-	-	Mar-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
Marine Pelagic	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Smooth dogfish													May-Sep	-	-	-	May-Oct
	Southern stingray													-	-	-	-	Apr-Oct
	Spotted hake													-	-	-	-	Jan-Dec
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	Mar-Jun	Mar-Nov*
	Tautog													-	-	-	May-Oct	-
	Tautog													Apr-Aug	-	-	Jan-Dec	Jan-Dec
	Atlantic mackerel													-	-	-	-	Jan-Dec
	Blacktip shark													-	-	-	-	Mar-Apr
	Butterfish													-	-	-	-	May-Oct
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Crevalle jack													-	-	-	May-Oct	-







FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Dusky shark													-	-	-	-	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep
	Scalloped hammerhead													-	-	-	May-Oct	May-Oct
	Spanish mackerel													-	-	-	-	May-Sep
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	Nov-May	Nov-May
	Thresher shark													-	-	-	-	May-Sep



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	4,736.21	7.40
9A	Sheltered Tidal Flats	19.15	0.03
7	Exposed Tidal Flats	220.36	0.34

ESI SHORELINE HABITAT TYPES

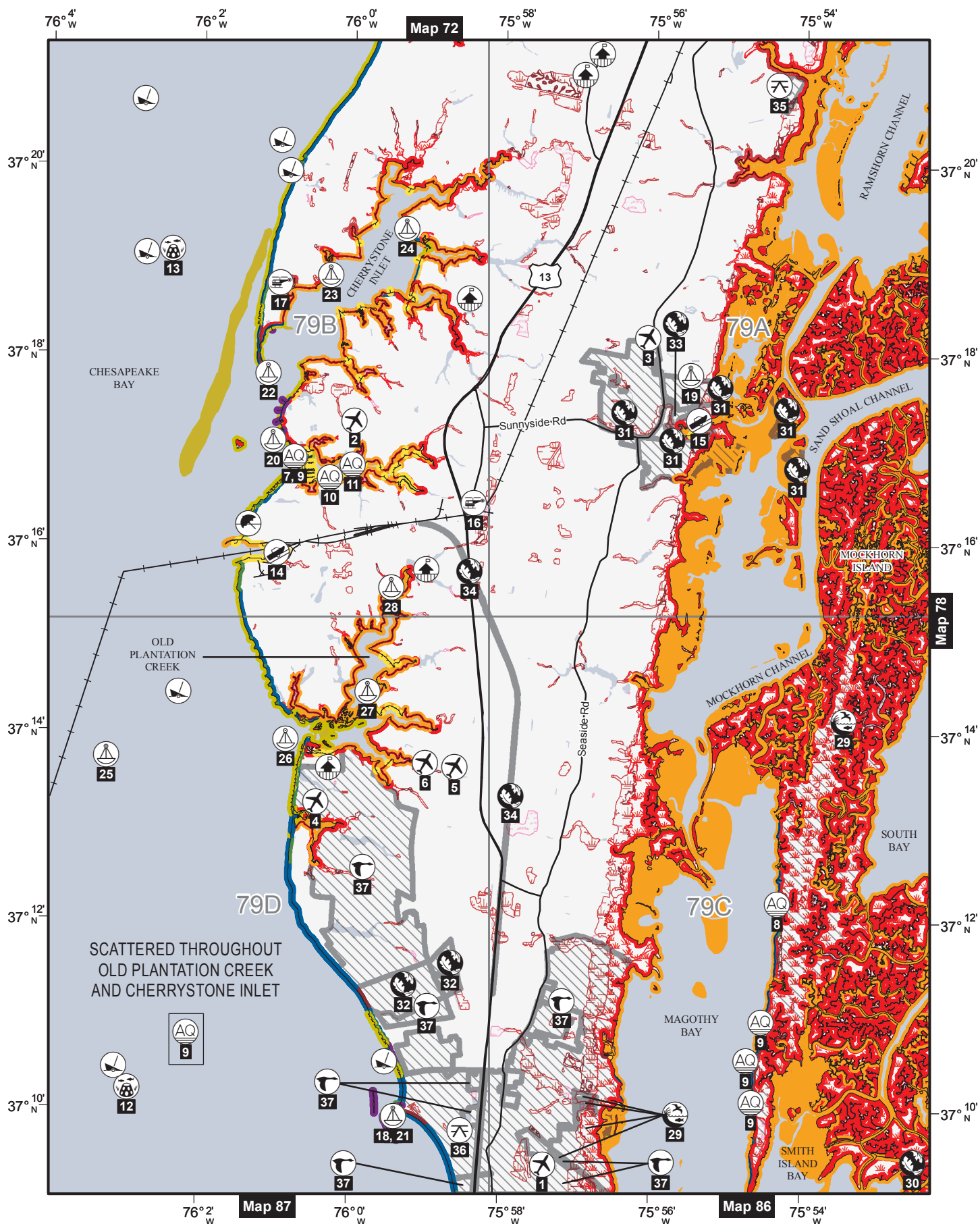
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	466,825.24	290.07	49%
9A	Sheltered Tidal Flats	459,362.98	285.44	48%
7	Exposed Tidal Flats	5,353.41	3.33	1%
4	Coarse Grained Sand Beaches	570.86	0.35	< 1%
3A	Fine to Medium Grained Sand Beaches	25,162.63	15.64	3%

Total ESI Shoreline: 957,275.11 Total ESI Shoreline: 594.82
Total Shoreline: 487,264.57 Total Shoreline: 302.77

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 79
Delmarva Peninsula



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 79
Delmarva Peninsula

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				Contact	Phone
Map ID	Type	Name			
1	AIRPORT	BULL FARM			
2	AIRPORT	CHERRYSTONE			
3	AIRPORT	EAGLES NEST			
4	AIRPORT	EARTH			
5	AIRPORT	SCOTT FARM STRIP			
6	AIRPORT	STARBASE			
7	AQUACULTURE	HARD CLAMS BALLARD FISH AND OYSTER C RF#95-1328		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
8	AQUACULTURE	HARD CLAMS HARRISON RF#335		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
9	AQUACULTURE	HARD CLAMS OB RF#335		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
10	AQUACULTURE	OYSTER NON-COMM BELL, JOHN A. RF#99-1590		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
11	AQUACULTURE	OYSTER NON-COMM HOGG, GRANVILLE RF#00-1051		CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM.	757-247-2254
12	ARTIFICIAL REEF	CABBAGE PATCH			
13	ARTIFICIAL REEF	CHERRYSTONE			
14	BOAT RAMP	CAPE CHARLES		LENE PENNINGTON, VDGIF	804-367-0058
15	BOAT RAMP	OYSTER		LENE PENNINGTON, VDGIF	804-367-0058
16	HELIPORT	AIRDUCE			
17	HELIPORT	POINT FARM			
18	REPEATED MEASUREMENT SITE	DB - NOS, 8632200 - KIPTOPEKE, VA		NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
19	REPEATED MEASUREMENT SITE	LTER VCR HOG ISLAND METEOROLOGICAL ST		LONG TERM ECOL RESEARCH NETWORK OFFICE	505-277-2597
20	REPEATED MEASUREMENT SITE	MWS - SITE CBCC		GREG PINIAK, PROJECT MANAGER	301-713-3028
21	REPEATED MEASUREMENT SITE	NWLN - KIPTOPEKE, CHESAPEAKE BAY		NATIONAL WATER LEVEL PROGRAM	301-713-2815
22	REPEATED MEASUREMENT SITE	WQ - STATION C-1		CHESAPEAKE BAY PROGRAM	800-968-7229
23	REPEATED MEASUREMENT SITE	WQ - STATION C-2		CHESAPEAKE BAY PROGRAM	800-968-7229
24	REPEATED MEASUREMENT SITE	WQ - STATION C-3		CHESAPEAKE BAY PROGRAM	800-968-7229
25	REPEATED MEASUREMENT SITE	WQ - STATION CB7.3E		CHESAPEAKE BAY PROGRAM	800-968-7229
26	REPEATED MEASUREMENT SITE	WQ - STATION OP-1		CHESAPEAKE BAY PROGRAM	800-968-7229
27	REPEATED MEASUREMENT SITE	WQ - STATION OP-2		CHESAPEAKE BAY PROGRAM	800-968-7229
28	REPEATED MEASUREMENT SITE	WQ - STATION OP-3		CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)				Contact	Phone
Map ID	Type	Name			
29	MANAGEMENT AREA	MOCKHORN WILDLIFE MANAGEMENT AREA		VA DEPT OF GAME AND INLAND FISHERIES	
30	NATURE CONSERVANCY	CEDAR ISLAND MACROSITE		THE NATURE CONSERVANCY	703-841-5300
31	NATURE CONSERVANCY	OYSTER		THE NATURE CONSERVANCY	703-841-5300
32	NATURE CONSERVANCY	PICKETTS HARBOR		THE NATURE CONSERVANCY	703-841-5300
33	NATURE CONSERVANCY	THE NATURE CONSERVANCY EASEMENT		THE NATURE CONSERVANCY	703-841-5300
34	NATURE CONSERVANCY	VA EASTERN SHORE MEGASITE		THE NATURE CONSERVANCY	703-841-5300
35	PARK	INDIANTOWN RECREATION PARK		NORTHAMPTON COUNTY	
36	PARK	KIPTOPEKE STATE PARK		VA DEPT OF CONSERVATION AND RECREATION	
37	WILDLIFE REFUGE	EASTERN SHORE OF VIRGINIA NWR		UNITED STATES FISH AND WILDLIFE SERVICE	757-331-3425

ALSO PRESENT IN MAPPED AREA (POINTS)			
Type	Name	Contact	Phone
COAST GUARD	STA CAPE CHARLES		757-331-2000
ALSO PRESENT IN MAPPED AREA (POLYGONS)			
Type	Name	Contact	Phone
STATE PROTECTED AREA	BLUE CRAB SANCTUARY	VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200
STATE PROTECTED AREA	CAPE CHARLES	VA DEPT OF CONSERVATION AND RECREATION	
STATE PROTECTED AREA	MAGOTHY BAY	VA DEPT OF CONSERVATION AND RECREATION	
STATE PROTECTED AREA	SAVAGE NECK DUNES	VA DEPT OF CONSERVATION AND RECREATION	
STATE PROTECTED AREA	TIDAL LANDS	VA MARINE RESOURCES COMMISSION	
JURISDICTIONS			
COUNTY:	NORTHAMPTON COUNTY	FEMA:	REGION 1
COAST GUARD:	DISTRICT 5, SECTOR HAMPTON ROADS	EPA:	REGION 3
USACE:	NORTH ATLANTIC DIVISION, NORFOLK DISTRICT		

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	11,720.57	18.31
10B	Freshwater Marshes	250.79	0.39
10C	Swamps	1,653.12	2.58
10D	Scrub and Shrub Wetlands	309.72	0.48
9A	Sheltered Tidal Flats	4,338.63	6.78
7	Exposed Tidal Flats	360.35	0.56

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	1,001,102.80	622.06	46%
10C	Swamps	5,946.24	3.69	< 1%
10D	Scrub and Shrub Wetlands	7,813.84	4.86	< 1%
9A	Sheltered Tidal Flats	991,847.92	616.31	46%
9B	Vegetated Low Banks	50,098.91	31.13	2%
8B	Sheltered, Solid Man-Made Structures	9,393.82	5.84	< 1%
8C	Sheltered Riprap	2,077.89	1.29	< 1%
7	Exposed Tidal Flats	35,329.61	21.95	2%
6A	Gravel Beaches	223.10	0.14	< 1%
6B	Riprap	7,984.03	4.96	< 1%
4	Coarse Grained Sand Beaches	618.41	0.38	< 1%
3A	Fine to Medium Grained Sand Beaches	36,015.54	22.38	2%
3B	Scarps and Steep Slopes (Sand)	1,557.92	0.97	< 1%
1B	Exposed, Solid Man-Made Structures	3,803.35	2.36	< 1%
Total ESI Shoreline:		2,153,813.40	1,338.32	
Total Shoreline:		1,047,943.68	651.16	

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

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



Map 79A
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MDVA S F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
47	Gull/Tern	Forster's tern	Nesting		6 Pairs													May-Jul	-	-	-
48	Gull/Tern	Forster's tern	Nesting		8 Pairs													May-Jul	-	-	-
49	Gull/Tern	Forster's tern	Nesting		42 Pairs													May-Jul	-	-	-
59	Shorebird	Shorebirds	Migration		Potential													-	May-Jun	Aug-Oct	-
63	Gull/Tern	Forster's tern	Nesting		16 Pairs													May-Jul	-	-	-
126	Wading	Great blue heron	Nesting		3 Nests													Feb-Jun	-	-	-
279	Shorebird	Shorebirds	Migration		High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration		222 Birds/Km2													-	May-Jun	-	-
326	Gull/Tern	Forster's tern	Nesting		28 Pairs													May-Jul	-	-	-
705	Raptor	Peregrine falcon	Nesting	-IT	-													Feb-Jun	-	-	-
707	Raptor	Bald eagle	Roosting		-													-	-	-	-
798	Raptor	Bald eagle	Nesting		1 Nest													Dec-Jun	-	-	-
872	Waterfowl	Canvasback	Wintering		10S													-	-	-	-
	Waterfowl	Ring-necked duck	Wintering		100S													-	-	-	-
	Waterfowl	Ruddy duck	Wintering		1,000S													-	-	-	-
	Waterfowl	Scaup	Wintering		100S													-	-	-	-
991	Gull/Tern	Gulls	Nesting		-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting		-													May-Aug	-	-	-
1000	Gull/Tern	Gulls	Nesting		-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting		-													May-Aug	-	-	-
	Shorebird	American oystercatcher	Nesting		1 Pair													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Wintering		-													-	-	-	-
1324	Shorebird	American oystercatcher	Wintering		-													-	-	-	-
1325	Shorebird	American oystercatcher	Nesting		1 Pair													Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Wintering		-													-	-	-	-

FISH

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

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1765	Turtle	Diamondback terrapin	Concentration Area			High											May-Aug	-	-	Apr-Oct	Apr-Oct	
	Turtle	Green sea turtle	General Distribution	T/T	T	Rare											-	-	May-Dec*	-		
	Turtle	Green sea turtle	General Distribution	T/T	T	Common											-	-	Jul-Oct	-		
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Uncommon											-	-	Nov-Dec	-		
	Turtle	K. ridley sea turtle	General Distribution	E/E	E	Common											-	-	Apr-Oct	-		
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Common											-	-	May-Jun	May-Jun		
	Turtle	Leatherback sea turtle	General Distribution	E/E	E	Rare											-	-	Mar-Dec*	Mar-Dec*		
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Abundant											-	-	Apr-Oct	Apr-Oct		
	Turtle	Loggerhead sea turtle	General Distribution	T/T	T	Common											-	-	Nov-Dec	Nov-Dec		

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults		
				S	F		J	F	M	A	M	J	J	A	S	O	N	D							
1788	Crab	Blue crab	Concentration Area			Highly Abundant-Summ													-	-	-	Jun-Oct	Jun-Oct	Jan-Dec	Jan-Dec
1830	Bivalve	Eastern oyster	Harvest Area			-													Jun-Sep	Jun-Sep	Jun-Oct	Jun-Oct	Jan-Dec	Jan-Dec	Jan-Dec

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)

BIRDS

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

Delmarva Peninsula: Map 79A

BIRDS (continued)

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Eggs	Larvae	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Scoters	Wintering			100S													-	-	-	-	-
	Snow goose	Wintering			1,000S													-	-	-	-	-
	Tundra swan	Wintering			100S													-	-	-	-	-

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Atlantic sturgeon	General Distribution	-/E	E	-													-	-	-	-	Jan-Dec
	Sandbar shark	Nursery Area			-													-	-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS

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

MARINE MAMMALS

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




ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican																	-	-	-	-
	D. crested cormorant																	-	Mar-May	Aug-Nov	-
	Saltmarsh sharp-tailed sparrow																	May-Aug	-	-	-
	Seaside sparrow																	May-Jul	-	-	-
	Willet																	May-Jul	-	-	-
	Clapper rail																	Apr-Sep	-	-	-
	Wood duck																	Apr-Jul	-	-	Jul-Aug



FISH

Monthly Presence

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

Delmarva Peninsula: Map 79A







FISH (continued)

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



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

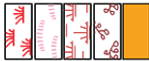
MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	3,924.04	6.13
10B	Freshwater Marshes	130.64	0.20
10C	Swamps	590.59	0.92
10D	Scrub and Shrub Wetlands	170.76	0.27
9A	Sheltered Tidal Flats	2,339.83	3.66



ESI SHORELINE HABITAT TYPES

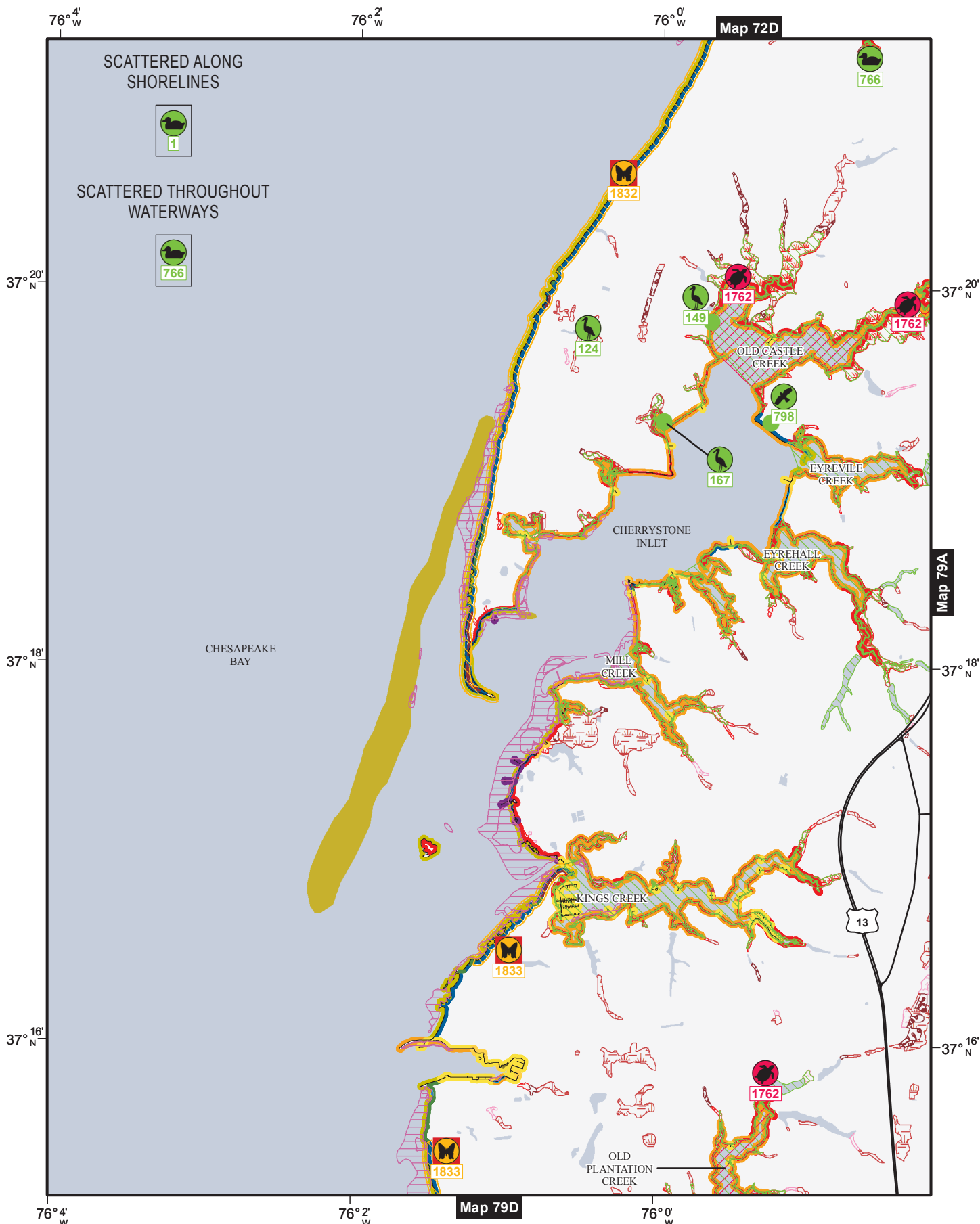
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	383,886.47	238.54	50%
10C	Swamps	4,600.23	2.86	1%
10D	Scrub and Shrub Wetlands	350.38	0.22	< 1%
9A	Sheltered Tidal Flats	383,904.35	238.55	50%
9B	Vegetated Low Banks	451.63	0.28	< 1%
8B	Sheltered, Solid Man-Made Structures	373.38	0.23	< 1%
8C	Sheltered Riprap	180.38	0.11	< 1%
6A	Gravel Beaches	223.10	0.14	< 1%
3A	Fine to Medium Grained Sand Beaches	643.75	0.40	< 1%

Total ESI Shoreline: 774,613.67 Total ESI Shoreline: 481.32
 Total Shoreline: 384,616.50 Total Shoreline: 238.99

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 79B
Delmarva Peninsula



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

0 1 Miles
Not for Navigation
0 1 Kilometers

1:50,000



Map 79B
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	MD/VA		Mapping Qualifier	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
1	Waterfowl	American black duck			Nesting													Apr-Jul	-	-	-
	Waterfowl	Canada goose			Nesting													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Mallard			Nesting													Mar-Aug	-	-	Jul-Aug
124	Wading	Great blue heron			Nesting													Feb-Jun	-	-	-
149	Wading	Great blue heron			Nesting													Feb-Jun	-	-	-
167	Wading	Great blue heron			Nesting													Feb-Jun	-	-	-
766	Waterfowl	American wigeon			Wintering													-	-	-	-
	Waterfowl	Blue-winged teal			Migration													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Bufflehead			Wintering													-	-	-	-
	Waterfowl	Canvasback			Wintering													-	-	-	-
	Waterfowl	Green-winged teal			Wintering													-	-	-	-
	Waterfowl	Ruddy duck			Wintering													-	-	-	-
	Waterfowl	Scaup			Wintering													-	-	-	-
798	Raptor	Bald eagle			Nesting													Dec-Jun	-	-	-




REPTILES & AMPHIBIANS

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



INVERTEBRATES

Map ID	Subelement	Species	MD/VA		Mapping Qualifier	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
1832	Insect	NE beach tiger beetle			Concentration Area													Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug
1833	Insect	NE beach tiger beetle			Vulnerable Occurrence													Jun-Aug	Jun-Aug	Jan-Dec	-	Jun-Aug


BIRDS

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


FISH

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



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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







ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Storm-petrels													-	-	-	-
	Wood duck													-	-	-	-
														Apr-Jul	-	-	Jul-Aug

FISH

Monthly Presence

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

REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	361.99	0.57
10B	Freshwater Marshes	17.41	0.03
10C	Swamps	196.96	0.31
10D	Scrub and Shrub Wetlands	41.33	0.06
9A	Sheltered Tidal Flats	1.89	0.00
7	Exposed Tidal Flats	315.68	0.49

ESI SHORELINE HABITAT TYPES

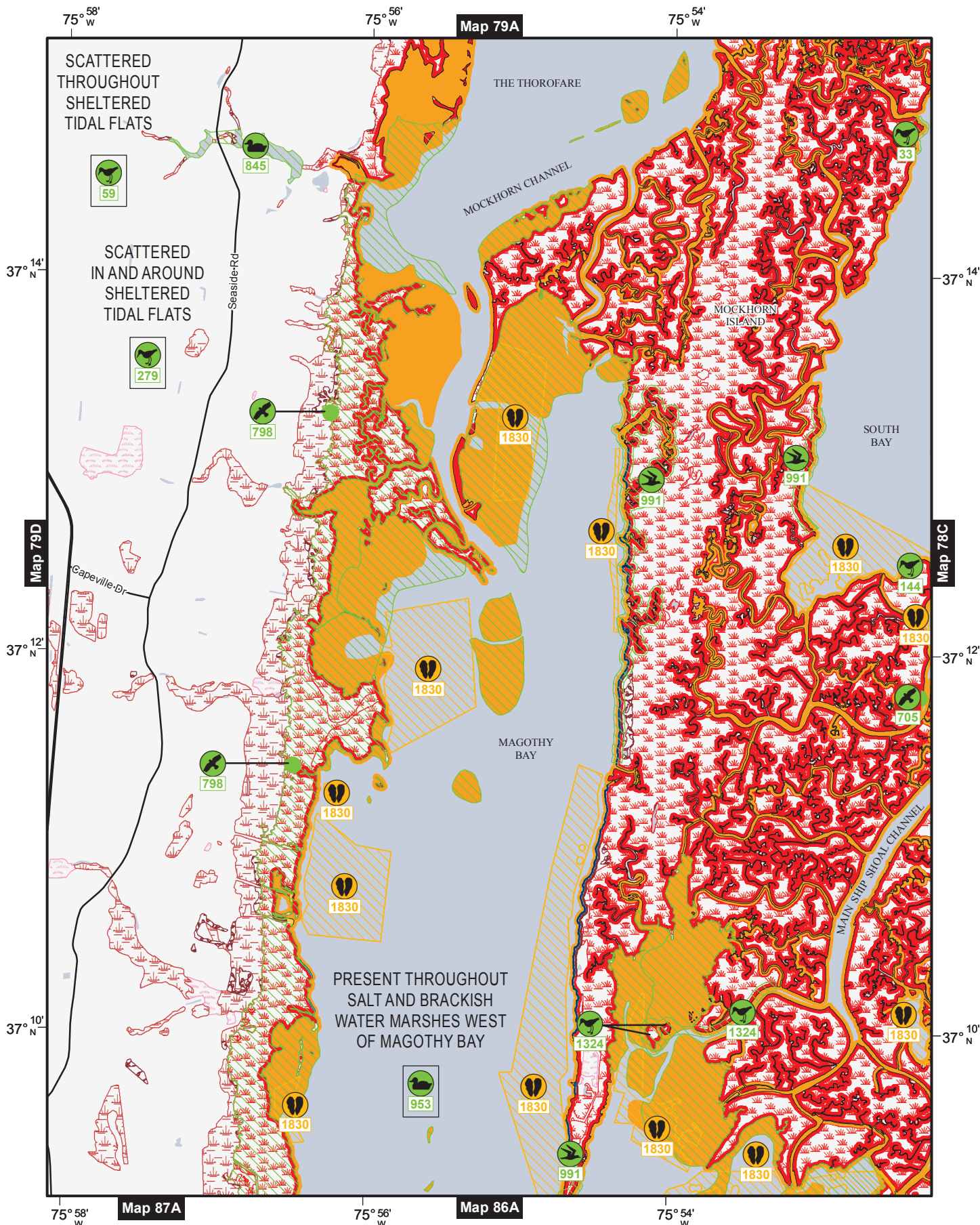
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	66,755.30	41.48	31%
10C	Swamps	1,000.92	0.62	< 1%
10D	Scrub and Shrub Wetlands	2,144.51	1.33	1%
9A	Sheltered Tidal Flats	64,652.82	40.17	30%
9B	Vegetated Low Banks	32,914.28	20.45	15%
8B	Sheltered, Solid Man-Made Structures	8,634.39	5.37	4%
8C	Sheltered Riprap	1,716.46	1.07	1%
7	Exposed Tidal Flats	19,592.50	12.17	9%
6B	Riprap	3,989.73	2.48	2%
4	Coarse Grained Sand Beaches	618.41	0.38	< 1%
3A	Fine to Medium Grained Sand Beaches	13,789.67	8.57	6%
3B	Scarps and Steep Slopes (Sand)	353.35	0.22	< 1%
1B	Exposed, Solid Man-Made Structures	612.23	0.38	< 1%

Total ESI Shoreline: 216,774.56 Total ESI Shoreline: 134.70
 Total Shoreline: 91,447.07 Total Shoreline: 56.82

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 79C
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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




BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Juveniles	Adults	Molt
33	Shorebird	American oystercatcher	Nesting				1 Pair													Apr-Aug	-	-	-	-	-
59	Shorebird	Shorebirds	Migration				Potential													-	May-Jun	Aug-Oct	-	-	-
144	Shorebird	American oystercatcher	Roosting				1 Pair													-	-	-	-	-	-
279	Shorebird	Shorebirds	Migration				High													-	May-Jun	Aug-Oct	-	-	-
	Shorebird	Whimbrel	Migration				222 Birds/Km2													-	May-Jun	-	-	-	-
705	Raptor	Peregrine falcon	Nesting				-/IT													Feb-Jun	-	-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-	-	-
845	Waterfowl	Canada goose	Wintering				100S													-	-	-	-	-	-
	Waterfowl	Ring-necked duck	Wintering				100S													-	-	-	-	-	-
953	Waterfowl	Brant	Wintering				100S													-	-	-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-	-	-
991	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-	-	-
	Gull/Tern	Terns	Nesting				-													May-Aug	-	-	-	-	-
1324	Shorebird	American oystercatcher	Wintering				-													-	-	-	-	-	-

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
1830	Bivalve	Eastern oyster	Harvest Area				-													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec


BIRDS

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

FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Atlantic sturgeon			-													-	-	-	-	Jan-Dec
	Marine Pelagic	Sandbar shark			-													-	-	-	-	May-Sep

REPTILES & AMPHIBIANS

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

MARINE MAMMALS

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS



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

FISH

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

Delmarva Peninsula: Map 79C







FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Striped burrfish													-	-	-	May-Oct	May-Oct
	Cleomose skate													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	May-Oct	-
	Tautog													-	-	-	Jan-Dec	Jan-Dec
	Butterfish													-	-	-	May-Oct	-
	Crevalle jack													-	-	-	Jun-Oct	-
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Sep



REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	7,260.60	11.34
10B	Freshwater Marshes	93.13	0.15
10C	Swamps	783.25	1.22
10D	Scrub and Shrub Wetlands	86.09	0.13
9A	Sheltered Tidal Flats	1,990.13	3.11

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	509,129.86	316.36	49%
10C	Swamps	178.27	0.11	< 1%
10D	Scrub and Shrub Wetlands	2,240.03	1.39	< 1%
9A	Sheltered Tidal Flats	510,036.95	316.92	50%
9B	Vegetated Low Banks	432.35	0.27	< 1%
8B	Sheltered, Solid Man-Made Structures	55.77	0.03	< 1%
8C	Sheltered Riprap	181.05	0.11	< 1%
3A	Fine to Medium Grained Sand Beaches	7,840.83	4.87	1%

Total ESI Shoreline: 1,030,095.11 Total ESI Shoreline: 640.07
 Total Shoreline: 511,394.17 Total Shoreline: 317.77

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 79D
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/V/A S F	Concentration	Monthly Presence										Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N			
1	Waterfowl	American black duck	Nesting		Present												Apr-Jul	-	-
	Waterfowl	Canada goose	Nesting		Present												Mar-Aug	-	Jun-Jul
	Waterfowl	Mallard	Nesting		Present												Mar-Aug	-	Jul-Aug
36	Diving	Grebes	Wintering		10S												-	-	-
	Waterfowl	American black duck	Wintering		10S												-	-	-
	Waterfowl	Canada goose	Wintering		10S												-	-	-
	Waterfowl	Gadwall	Wintering		10S												-	-	-
	Waterfowl	Mergansers	Wintering		10S												-	-	-
	Waterfowl	Scoters	Wintering		100S												-	-	-
61	Diving	Grebes	Wintering		Present												-	-	-
	Waterfowl	Blue-winged teal	Migration		10S												-	Feb-Apr	Aug-Oct
	Waterfowl	Brant	Wintering		10S												-	-	-
	Waterfowl	Green-winged teal	Wintering		10S												-	-	-
	Waterfowl	Ruddy duck	Wintering		100S												-	-	-
	Waterfowl	Scaup	Wintering		10S												-	-	-
	Waterfowl	Scoters	Wintering		1,000S												-	-	-
	Waterfowl	Snow goose	Wintering		100S												-	-	-
	Wading	Great blue heron	Nesting		27 Nests												Feb-Jun	-	-
174	Waterfowl	American black duck	Wintering		100S												-	-	-
714	Waterfowl	American wigeon	Wintering		100S												-	-	-
	Waterfowl	Blue-winged teal	Migration		100S												-	Feb-Apr	Aug-Oct
	Waterfowl	Bufflehead	Wintering		1,000S												-	-	-
	Waterfowl	Canada goose	Wintering		1,000S												-	-	-
	Waterfowl	Canvasback	Wintering		10S												-	-	-
	Waterfowl	Gadwall	Wintering		100S												-	-	-
	Waterfowl	Green-winged teal	Wintering		100S												-	-	-
	Waterfowl	Mallard	Wintering		100S												-	-	-
	Waterfowl	Mergansers	Wintering		100S												-	-	-
	Waterfowl	Ring-necked duck	Wintering		100S												-	-	-
	Waterfowl	Ruddy duck	Wintering		1,000S												-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt	
				S	F		J	F	M	A	M	J	J	A	S	O	N	D					
753	Waterfowl	Scaup	Wintering			100S													-				-
	Waterfowl	Tundra swan	Wintering			100S													-				-
	Waterfowl	American black duck	Wintering			100S													-				-
	Waterfowl	Canada goose	Wintering			1,000S													-				-
	Waterfowl	Gadwall	Wintering			100S													-				-
	Waterfowl	Mallard	Wintering			100S													-				-
	Waterfowl	Mergansers	Wintering			100S													-				-
	Waterfowl	Ring-necked duck	Wintering			100S													-				-
	Waterfowl	Tundra swan	Wintering			100S													-				-
	Waterfowl	American wigeon	Wintering			100S													-				-
766	Waterfowl	Blue-winged teal	Migration			100S													-	Feb-Apr	Aug-Oct		-
	Waterfowl	Bufflehead	Wintering			1,000S													-				-
	Waterfowl	Canvasback	Wintering			10S													-				-
	Waterfowl	Green-winged teal	Wintering			100S													-				-
	Waterfowl	Ruddy duck	Wintering			1,000S													-				-
798	Waterfowl	Scaup	Wintering			100S													-				-
	Raptor	Bald eagle	Nesting			1 Nest													Dec-Jun				-

REPTILES & AMPHIBIANS




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

INVERTEBRATES



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

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N	D	Nest	Mig.(S)	Mig.(F)	Molt
	Diving	Common loon	Wintering				100S													-	-	-	-
		D. crested cormorant	Wintering				100S													-	Mar-May	Aug-Nov	-
		Grebes	Wintering				100S													-	-	-	-
	Pelagic	Red-throated loon	Wintering				100S													-	-	-	-
		Northern gannet	Wintering				100S													-	-	-	-
		American wigeon	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
		Common goldeneye	Wintering				Present													-	-	-	-
		Long-tailed duck	Wintering				Present													-	-	-	-
		Scoters	Wintering				10,000S													-	-	-	-


FISH

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

REPTILES & AMPHIBIANS

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





INVERTEBRATES

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













MARINE MAMMALS

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


BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Diving													-	-	-	-	-
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	Gull/Tern													-	-	-	-	-
	Terns													-	-	-	-	-
	Pelagic													-	-	-	-	-
	Storm-petrels													-	-	-	-	-
	Waterfowl													-	-	-	-	-
	Wood duck													Apr-Jul	-	-	Jul-Aug	-

FISH

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





FISH (continued)

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


REPTILES & AMPHIBIANS

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	173.94	0.27
10B	Freshwater Marshes	9.61	0.02
10C	Swamps	82.32	0.13
10D	Scrub and Shrub Wetlands	11.54	0.02
9A	Sheltered Tidal Flats	6.78	0.01
7	Exposed Tidal Flats	44.67	0.07

ESI SHORELINE HABITAT TYPES

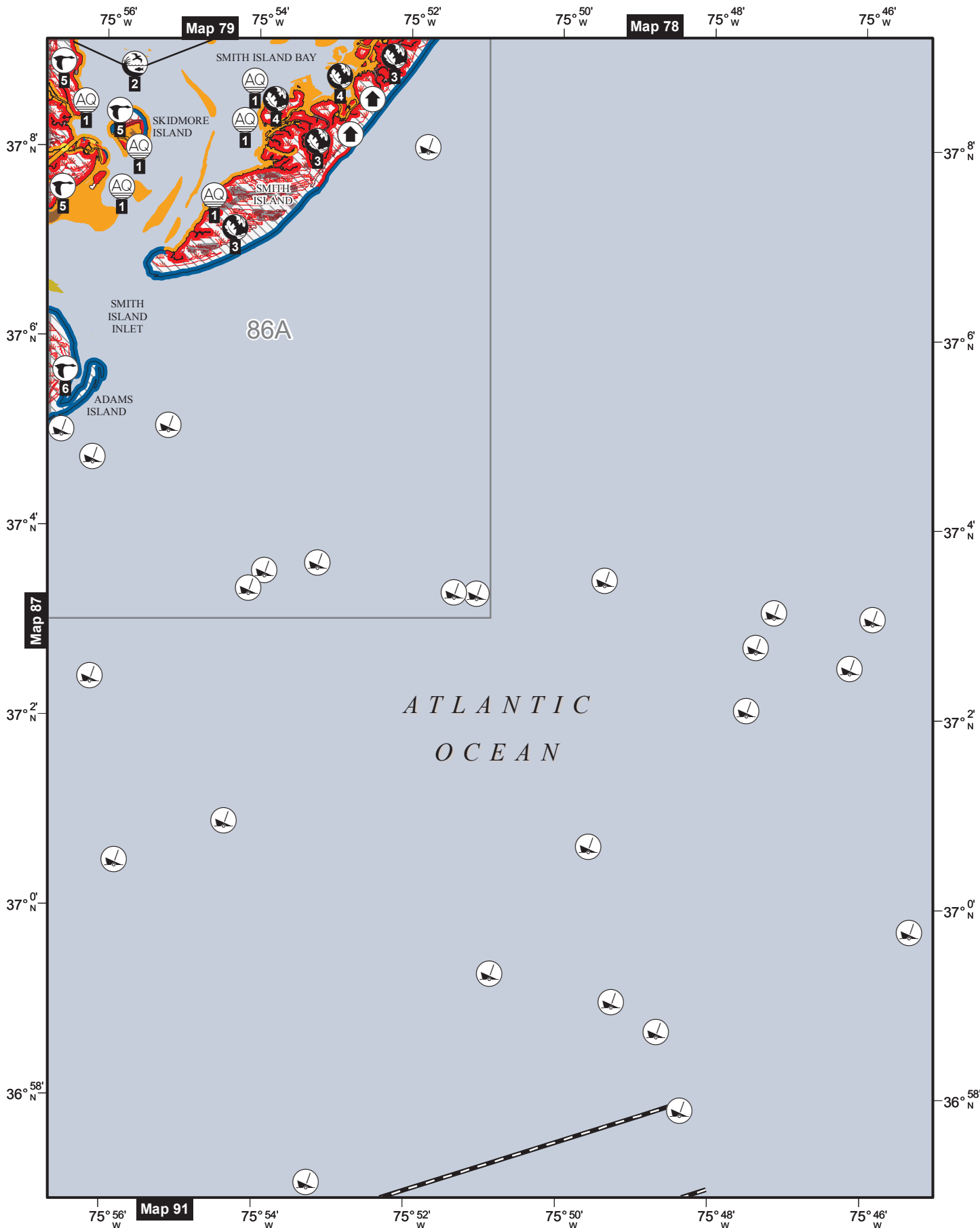
ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	41,331.16	25.68	31%
10C	Swamps	166.82	0.10	< 1%
10D	Scrub and Shrub Wetlands	3,078.92	1.91	2%
9A	Sheltered Tidal Flats	33,253.81	20.66	25%
9B	Vegetated Low Banks	16,300.66	10.13	12%
8B	Sheltered, Solid Man-Made Structures	330.28	0.21	< 1%
7	Exposed Tidal Flats	15,737.11	9.78	12%
6B	Riprap	3,994.30	2.48	3%
3A	Fine to Medium Grained Sand Beaches	13,741.30	8.54	10%
3B	Scarps and Steep Slopes (Sand)	1,204.58	0.75	1%
1B	Exposed, Solid Man-Made Structures	3,191.12	1.98	2%

Total ESI Shoreline: 132,330.06 Total ESI Shoreline: 82.23
 Total Shoreline: 60,485.93 Total Shoreline: 37.58

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 86
Delmarva Peninsula

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)			
Map ID	Type	Name	Contact Phone
1	AQUACULTURE	HARD CLAMS OB RF#335	CHIP NEIKIRK, VIRGINIA MARINE RESOURCES COMM. 757-247-2254

DISPLAYED ON MAP (POLYGONS)			
Map ID	Type	Name	Contact Phone
2	MANAGEMENT AREA	MOCKHORN WILDLIFE MANAGEMENT AREA	VA DEPT OF GAME AND INLAND FISHERIES
3	NATURE CONSERVANCY	CEDAR ISLAND MACROSITE	THE NATURE CONSERVANCY 703-841-5300
4	NATURE CONSERVANCY	CEDAR ISLAND MACROSITE/SMITH ISLAND	THE NATURE CONSERVANCY 703-841-5300
5	WILDLIFE REFUGE	EASTERN SHORE OF VIRGINIA NWR	UNITED STATES FISH AND WILDLIFE SERVICE 757-331-3425
6	WILDLIFE REFUGE	FISHERMAN ISLAND NWR	UNITED STATES FISH AND WILDLIFE SERVICE 757-331-1760

ALSO PRESENT IN MAPPED AREA (POLYGONS)			
Type	Name	Contact	Phone
STATE PROTECTED AREA	BLUE CRAB SANCTUARY	VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200
STATE PROTECTED AREA	MAGOTHY BAY	VA DEPT OF CONSERVATION AND RECREATION	

JURISDICTIONS

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

FEMA: REGION I
EPA: REGION 3

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	1,690.99	2.64
10B	Freshwater Marshes	1.28	0.00
10C	Swamps	14.35	0.02
10D	Scrub and Shrub Wetlands	57.68	0.09
9A	Sheltered Tidal Flats	617.29	0.96
7	Exposed Tidal Flats	10.96	0.02



ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	78,728.40	48.92	44%
10D	Scrub and Shrub Wetlands	383.93	0.24	< 1%
9A	Sheltered Tidal Flats	79,389.13	49.33	45%
8B	Sheltered, Solid Man-Made Structures	148.87	0.09	< 1%
8C	Sheltered Riprap	234.75	0.15	< 1%
7	Exposed Tidal Flats	72.10	0.04	< 1%
3A	Fine to Medium Grained Sand Beaches	18,538.42	11.52	10%
Total ESI Shoreline:		177,495.60	110.29	
Total Shoreline:		94,383.18	58.65	

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

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



Map 86A
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VFA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
17	Waterfowl	American black duck	Nesting				Present													Apr-Jul	-	-	-
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				100S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
20	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
	Waterfowl	American black duck	Nesting				Present													Apr-Jul	-	-	-
	Waterfowl	American black duck	Wintering				1,000S													-	-	-	-
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
21	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Northern pintail	Wintering				10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				100S													-	-	-	-
	Waterfowl	American black duck	Nesting				Present													Apr-Jul	-	-	-
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				100S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N				
	Waterfowl	Gadwall	Wintering			100S												-	-	-	-
	Waterfowl	Green-winged teal	Wintering			100S												-	-	-	-
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering			100S												-	-	-	-
	Waterfowl	Mergansers	Wintering			10S												-	-	-	-
	Waterfowl	Tundra swan	Wintering			10S												-	-	-	-
59	Shorebird	Shorebirds	Migration			Potential												-	May-Jun	Aug-Oct	-
189	Shorebird	American oystercatcher	Nesting			1 Pair												Apr-Aug	-	-	-
	Shorebird	Piping plover	Nesting			-												Apr-Aug	-	-	-
279	Shorebird	Shorebirds	Migration			High												-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration			222 Birds/Km2												-	May-Jun	-	-
330	Shorebird	American oystercatcher	Nesting			24 Pairs												Apr-Aug	-	-	-
	Shorebird	American oystercatcher	Roosting			2 Pairs												-	-	-	-
369	Gull/Tern	Black skimmer	General Distribution			100S												-	-	-	-
	Gull/Tern	Royal tern	General Distribution			100S												-	-	-	-
	Shorebird	American oystercatcher	Nesting			31 Pairs												Apr-Aug	-	-	-
	Shorebird	Dunlin	Migration			100S												-	Apr-May	Oct-Nov	-
	Shorebird	Piping plover	Nesting			3 Nests												Apr-Aug	-	-	-
	Shorebird	Red knot	Migration			Up To 33 Birds/Km												-	Apr-Jun	Jul-Oct	-
	Shorebird	Sanderling	Migration			100S												-	May-Jun	Aug-Oct	-
383	Shorebird	Dunlin	Migration			1000S												-	Apr-May	Oct-Nov	-
	Shorebird	Red knot	Migration			Up To 68 Birds/Km												-	Apr-Jun	Jul-Oct	-
	Shorebird	Ruddy turnstone	Migration			100S												-	May	Aug	-
	Shorebird	Sanderling	Migration			100S												-	May-Jun	Aug-Oct	-
	Shorebird	Western sandpiper	Migration			100S												-	Mar	Sep-Oct	-
	Shorebird	Willet	Migration			100S												-	May	Jul	-
385	Raptor	Osprey	Nesting			-												Mar-Aug	-	-	-
798	Raptor	Bald eagle	Nesting			1 Nest												Dec-Jun	-	-	-
991	Gull/Tern	Gulls	Nesting			-												Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting			-												May-Aug	-	-	-
1275	Shorebird	Piping plover	Roosting			3 Adults												-	-	-	-
1324	Shorebird	American oystercatcher	Wintering			-												-	-	-	-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					
1758	Turtle	Loggerhead sea turtle	Nesting			Potential												May-Aug	Jun-Oct	-	Jun-Oct	May-Aug
1762	Turtle	Diamondback terrapin	Concentration Area			High												May-Aug	-	-	Apr-Oct	Apr-Oct
1766	Turtle	Loggerhead sea turtle	Nesting			0-1 Nest												May-Aug	Jun-Oct	-	Jun-Oct	May-Aug
1783	Turtle	K. ridley sea turtle	General Distribution			Common												-	-	-	Apr-Oct*	Apr-Oct*
	Turtle	K. ridley sea turtle	General Distribution			Rare												-	-	-	Nov-Dec	-
	Turtle	K. ridley sea turtle	General Distribution			Abundant												-	-	-	May-Jun	May-Jun
	Turtle	Loggerhead sea turtle	General Distribution			Abundant												-	-	-	Apr-Oct*	Apr-Oct*
	Turtle	Loggerhead sea turtle	General Distribution			Very Abundant												-	-	-	May-Jun	May-Jun
	Turtle	Loggerhead sea turtle	General Distribution			Rare												-	-	-	Nov-Dec	Nov-Dec





Delmarva Peninsula: Map 86A

INVERTEBRATES



Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults		
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D	Spawn
1790	Insect	Monarch butterfly	Migration			-																	Sep-Nov
1830	Bivalve	Eastern oyster	Harvest Area			-																	Jan-Dec

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
			S	F		J	F	M	A	M	J	J	A	S	O	N	D				
	Alcid	Wintaring			10S													-	-	-	-
	Diving	Wintaring			Present													-	-	-	-
	Common loon	Wintaring			1,000S													-	-	-	-
	D. crested cormorant	Wintaring			1,000S													-	Mar-May	Aug-Nov	-
	Grebes	Wintaring			10S													-	-	-	-
	Grebes	Wintaring			100S													-	-	-	-
	Red-throated loon	Wintaring			10S													-	-	-	-
	Red-throated loon	Wintaring			1,000S													-	-	-	-
	Northern gannet	Wintaring			100S													-	-	-	-
	Northern gannet	Wintaring			1,000S													-	-	-	-
	American black duck	Wintaring			100S													-	-	-	-
	Brant	Wintaring			1,000S													-	-	-	-
	Bufflehead	Wintaring			1,000S													-	-	-	-
	Canada goose	Wintaring			1,000S													-	-	-	-
	Gadwall	Wintaring			10S													-	-	-	-
	Long-tailed duck	Wintaring			10S													-	-	-	-
	Mallard	Wintaring			10S													-	-	-	-
	Mergansers	Wintaring			100S													-	-	-	-
	Red-breasted merganser	Wintaring			100S													-	-	-	-
	Sooters	Wintaring			10,000S													-	-	-	-
	Sooters	Wintaring			100S													-	-	-	-
	Snow goose	Wintaring			1,000S													-	-	-	-



FISH

Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
			S	F		J	F	M	A	M	J	J	A	S	O	N	D					
	Diadromous	Migration			-													-	-	-	Jan-May	Sep-Dec
	Atlantic sturgeon	General Distribution			-													-	-	-	-	Jan-Dec
	Sandbar shark	Nursery Area			-													-	-	-	May-Sep	May-Sep

REPTILES & AMPHIBIANS






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

MARINE MAMMALS

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




ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)

BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	Mar-May	Aug-Nov	-
	Forster's tern													-	-	Aug-Oct	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Saltmarsh sharp-tailed sparrow													May-Aug	-	-	-
	Shearwaters													-	-	-	-
	Storm-petrels													-	-	-	-
	Phalaropes													-	-	-	-
	Willet													May-Jul	-	-	-
	Clapper rail													Apr-Sep	-	-	-
	Wood duck													Apr-Jul	-	-	Jul-Aug





FISH

Monthly Presence

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

Delmarva Peninsula: Map 86A

FISH (continued)








Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Fish																	
	Anchovies																	
	Anchovies																	
	Great hammerhead																	
	Striped burrfish																	
	Atlantic angel shark																	
	Atlantic spadefish																	
	Cleannose skate																	
	Cownose ray																	
	Northern searobin																	
	Marine Benthic																	
	Northern searobin																	
	Northern stargazer																	
	Red hake																	
	Silver hake																	
	Smooth butterfly ray																	
	Smooth dogfish																	
	Southern stingray																	
	Spotted hake																	
	Spotted hake																	
	Marine Pelagic																	
	Atlantic mackerel																	
	Blacktip shark																	
	Butterfish																	
	Butterfish																	
	Crevalle jack																	
	Dusky shark																	
	Great white shark																	
	Lined seahorse																	
	Sand tiger shark																	
	Sandbar shark																	
	Scalloped hammerhead																	
	Scalloped hammerhead																	
	Spanish mackerel																	
	Spinner shark																	
	Spiny dogfish																	
	Thresher shark																	
	Thresher shark																	
	Thresher shark																	
	Thresher shark																	

REPTILES & AMPHIBIANS



Subelement	Species	Monthly Presence												Nest	Hatch	Interest	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Turtle																	
	Diamondback terrapin																	
	Diamondback terrapin																	
	Diamondback terrapin																	

Delmarva Peninsula: Map 86A

INVERTEBRATES

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

MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	1,690.99	2.64
10B	Freshwater Marshes	1.28	0.00
10C	Swamps	14.35	0.02
10D	Scrub and Shrub Wetlands	57.68	0.09
9A	Sheltered Tidal Flats	617.29	0.96
7	Exposed Tidal Flats	10.96	0.02

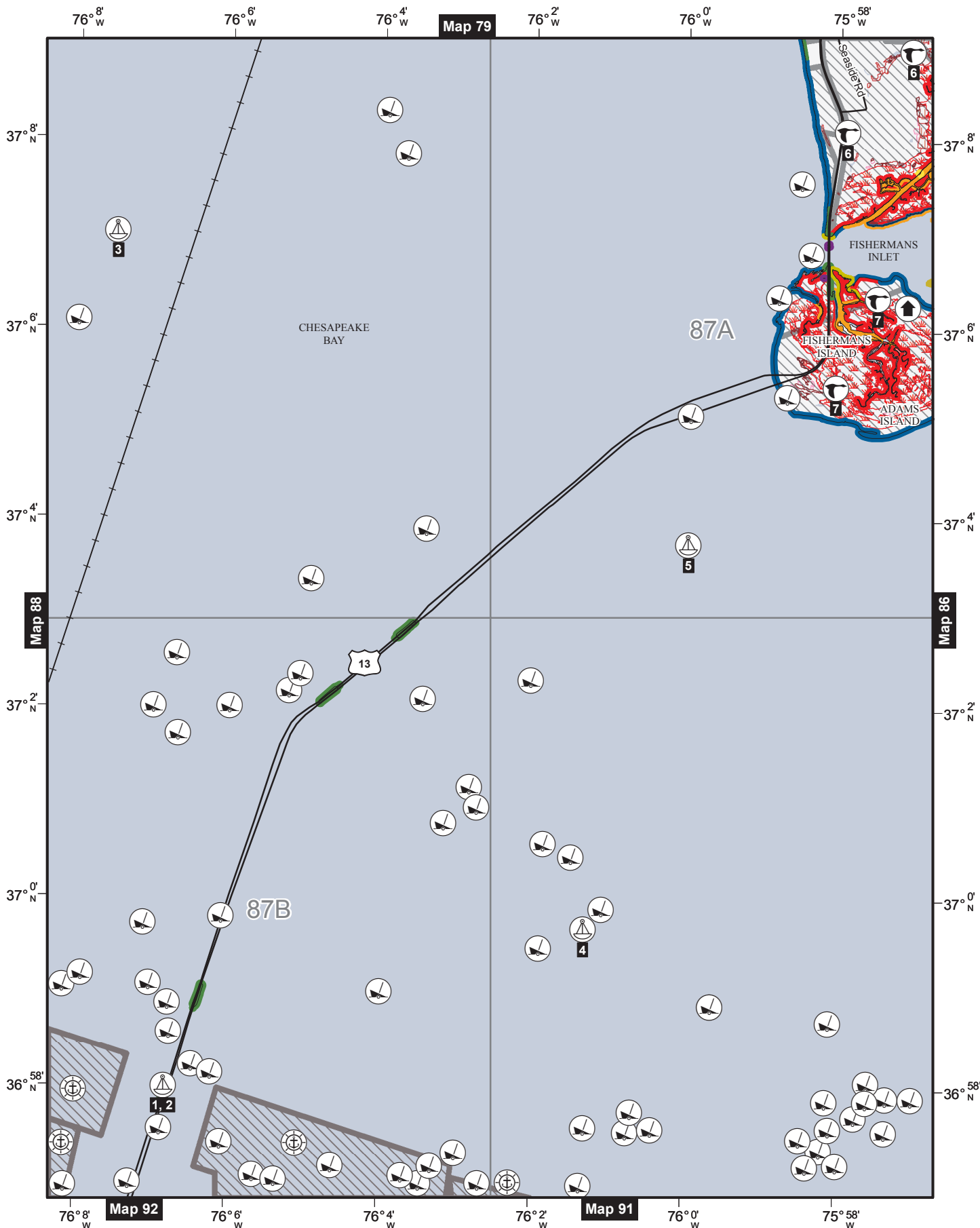
ESI SHORELINE HABITAT TYPES

<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	78,728.40	48.92	44%
10D	Scrub and Shrub Wetlands	383.93	0.24	< 1%
9A	Sheltered Tidal Flats	79,389.13	49.33	45%
8B	Sheltered, Solid Man-Made Structures	148.87	0.09	< 1%
8C	Sheltered Riprap	234.75	0.15	< 1%
7	Exposed Tidal Flats	72.10	0.04	< 1%
3A	Fine to Medium Grained Sand Beaches	18,538.42	11.52	10%
Total ESI Shoreline:		177,495.60	110.29	
Total Shoreline:		94,383.18	58.65	

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

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





Map 87
Delmarva Peninsula



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

0 2 Miles
Not for Navigation
0 2 Kilometers

1:100,000



Map 87
Delmarva Peninsula

HUMAN USE RESOURCES

DISPLAYED ON MAP (POINTS)				
Map ID	Type	Name	Contact	Phone
1	REPEATED MEASUREMENT SITE	DB - NOS, 8638863 - CHESAPEAKE BAY BRIDGE TUNNEL	NATIONAL COASTAL DATA DEVELOPMENT CENTER	866-732-2382
2	REPEATED MEASUREMENT SITE	NWLN - CHESAPEAKE BAY BRIDGE TUNNEL	NATIONAL WATER LEVEL PROGRAM	301-713-2815
3	REPEATED MEASUREMENT SITE	WQ - STATION CB7.3	CHESAPEAKE BAY PROGRAM	800-968-7229
4	REPEATED MEASUREMENT SITE	WQ - STATION CB7.4	CHESAPEAKE BAY PROGRAM	800-968-7229
5	REPEATED MEASUREMENT SITE	WQ - STATION CB7.4N	CHESAPEAKE BAY PROGRAM	800-968-7229

DISPLAYED ON MAP (POLYGONS)				
Map ID	Type	Name	Contact	Phone
6	WILDLIFE REFUGE	EASTERN SHORE OF VIRGINIA NWR	UNITED STATES FISH AND WILDLIFE SERVICE	757-331-3425
7	WILDLIFE REFUGE	FISHERMAN ISLAND NWR	UNITED STATES FISH AND WILDLIFE SERVICE	757-331-1760

ALSO PRESENT IN MAPPED AREA (POLYGONS)				
Type	Name	Contact	Phone	
STATE PROTECTED AREA	BLUE CRAB SANCTUARY	VIRGINIA MARINE RESOURCES COMMISSION	757-247-2200	
STATE PROTECTED AREA	MAGOTHY BAY	VA DEPT OF CONSERVATION AND RECREATION		

JURISDICTIONS

COUNTY:	HAMPTON CITY, NORFOLK CITY, NORTHAMPTON COUNTY, POQUOSON CITY, VIRGINIA BEACH CITY	FEMA:	REGION 1
COAST GUARD:	DISTRICT 5, SECTOR HAMPTON ROADS	EPA:	REGION 3
USACE:	NORTH ATLANTIC DIVISION, NORFOLK DISTRICT		

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
10A	Salt and Brackish Water Marshes	1,429.98	2.23
10B	Freshwater Marshes	12.50	0.02
10C	Swamps	85.56	0.13
10D	Scrub and Shrub Wetlands	56.55	0.09
9A	Sheltered Tidal Flats	2.63	0.00
7	Exposed Tidal Flats	7.22	0.01

ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
10A	Salt and Brackish Water Marshes	49,495.21	30.75	40%
10D	Scrub and Shrub Wetlands	243.30	0.15	< 1%
9A	Sheltered Tidal Flats	42,447.25	26.38	35%
8B	Sheltered, Solid Man-Made Structures	159.13	0.10	< 1%
7	Exposed Tidal Flats	3,091.69	1.92	3%
6B	Riprap	6,298.69	3.91	5%
3A	Fine to Medium Grained Sand Beaches	19,482.07	12.11	16%
3B	Scarps and Steep Slopes (Sand)	1,094.10	0.68	1%
1B	Exposed, Solid Man-Made Structures	489.86	0.30	< 1%
Total ESI Shoreline:		122,801.30	76.31	
Total Shoreline:		68,443.31	42.53	

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 87A
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BENTHIC

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

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
				S	F		J	F	M	A	M	J	J	A	S	O	N	D				
1	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-	
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul	
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug	
	9	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-
		Waterfowl	American black duck	Wintering			100S												-	-	-	-
		Waterfowl	American wigeon	Wintering			100S												-	-	-	-
		Waterfowl	Blue-winged teal	Migration			100S												-	Feb-Apr	Aug-Oct	-
Waterfowl		Brant	Wintering			100S												-	-	-	-	
Waterfowl		Bufflehead	Wintering			10S												-	-	-	-	
Waterfowl		Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul	
12	Waterfowl	Canada goose	Wintering			100S												-	-	-	-	
	Waterfowl	Gadwall	Wintering			100S												-	-	-	-	
	Waterfowl	Green-winged teal	Wintering			100S												-	-	-	-	
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug	
	Waterfowl	Mallard	Wintering			100S												-	-	-	-	
	Waterfowl	Mergansers	Wintering			10S												-	-	-	-	
	Waterfowl	Northern shoveler	Wintering			10S												-	-	-	-	
	Waterfowl	Snow goose	Wintering			1,000S												-	-	-	-	
	Waterfowl	Tundra swan	Wintering			10S												-	-	-	-	
	Waterfowl	American black duck	Nesting			Present												Apr-Jul	-	-	-	
	Waterfowl	American black duck	Wintering			100S												-	-	-	-	
	Waterfowl	American wigeon	Wintering			100S												-	-	-	-	
	Waterfowl	Blue-winged teal	Migration			100S												-	Feb-Apr	Aug-Oct	-	
	Waterfowl	Brant	Wintering			100S												-	-	-	-	
	Waterfowl	Bufflehead	Wintering			100S												-	-	-	-	
	Waterfowl	Canada goose	Nesting			Present												Mar-Aug	-	-	Jun-Jul	
	Waterfowl	Canada goose	Wintering			1,000S												-	-	-	-	
	Waterfowl	Gadwall	Wintering			100S												-	-	-	-	
	Waterfowl	Green-winged teal	Wintering			100S												-	-	-	-	
	Waterfowl	Mallard	Nesting			Present												Mar-Aug	-	-	Jul-Aug	
	Waterfowl	Mallard	Wintering			100S												-	-	-	-	
	Waterfowl																	-	-	-	-	

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
21	Waterfowl	American black duck	Nesting				Present													Apr-Jul	-	-	-
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				100S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
	Waterfowl	Canada goose	Nesting				Present													Mar-Aug	-	-	Jun-Jul
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Nesting				Present													Mar-Aug	-	-	Jul-Aug
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
37	Diving	Grebes	Wintering				10S													-	-	-	-
	Waterfowl	Gadwall	Wintering				10S													-	-	-	-
	Waterfowl	Sooters	Wintering				100S													-	-	-	-
45	Gull/Tern	Forster's tern	Nesting				12 Pairs													May-Jul	-	-	-
	Shorebird	Shorebirds	Migration				Potential													-	May-Jun	Aug-Oct	-
96	Waterfowl	American black duck	Wintering				10S													-	-	-	-
	Waterfowl	American wigeon	Wintering				10S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				100S													-	-	-	-
	Waterfowl	Canada goose	Wintering				10S													-	-	-	-
	Waterfowl	Common goldeneye	Wintering				Present													-	-	-	-
	Waterfowl	Long-tailed duck	Wintering				Present													-	-	-	-
	Wading	Great blue heron	Nesting				52 Nests													Feb-Jun	-	-	-
132	Shorebird	American oystercatcher	Nesting				1 Pair													Apr-Aug	-	-	-
	Shorebird	Piping plover	Nesting				-													Apr-Aug	-	-	-
279	Shorebird	Shorebirds	Migration				High													-	May-Jun	Aug-Oct	-
	Shorebird	Whimbrel	Migration				222 Birds/Km2													-	May-Jun	-	-
369	Gull/Tern	Black skimmer	General Distribution				100S													-	-	-	-
	Gull/Tern	Royal tern	General Distribution				100S													-	-	-	-
	Shorebird	American oystercatcher	Nesting				31 Pairs													Apr-Aug	-	-	-
	Shorebird	Dunlin	Migration				100S													-	Apr-May	Oct-Nov	-
	Shorebird	Piping plover	Nesting				3 Nests													Apr-Aug	-	-	-
	Shorebird	Red knot	Migration				Up To 33 Birds/Km													-	Apr-Jun	Jul-Oct	-
	Shorebird	Sanderling	Migration				100S													-	May-Jun	Aug-Oct	-
385	Raptor	Osprey	Nesting				-													Mar-Aug	-	-	-
705	Raptor	Peregrine falcon	Nesting				-													Feb-Jun	-	-	-
710	Waterfowl	American black duck	Wintering				100S													-	-	-	-
711	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				100S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				10S													-	-	-	-
	Waterfowl	Snow goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
713	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				100S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				10S													-	-	-	-
	Waterfowl	Snow goose	Wintering				1,000S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
765	Waterfowl	American wigeon	Wintering				100S													-	-	-	-
	Waterfowl	Blue-winged teal	Migration				100S													-	Feb-Apr	Aug-Oct	-
	Waterfowl	Brant	Wintering				100S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				10S													-	-	-	-
	Waterfowl	Canada goose	Wintering				100S													-	-	-	-
	Waterfowl	Gadwall	Wintering				100S													-	-	-	-
	Waterfowl	Green-winged teal	Wintering				100S													-	-	-	-
	Waterfowl	Mallard	Wintering				100S													-	-	-	-
	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
	Waterfowl	Northern shoveler	Wintering				10S													-	-	-	-
	Waterfowl	Tundra swan	Wintering				10S													-	-	-	-
798	Raptor	Bald eagle	Nesting				1 Nest													Dec-Jun	-	-	-
899	Waterfowl	Mergansers	Wintering				10S													-	-	-	-
945	Waterfowl	Snow goose	Wintering				1,000S													-	-	-	-
956	Waterfowl	Canada goose	Wintering				1,000S													-	-	-	-
991	Gull/Tern	Gulls	Nesting				-													Apr-Jul	-	-	-
	Gull/Tern	Terns	Nesting				-													May-Aug	-	-	-
1128	Diving	Common loon	Wintering				Present													-	-	-	-
	Diving	Grebes	Wintering				10S													-	-	-	-
	Diving	Red-throated loon	Wintering				10S													-	-	-	-
	Waterfowl	American black duck	Wintering				100S													-	-	-	-
	Waterfowl	Brant	Wintering				1,000S													-	-	-	-
	Waterfowl	Bufflehead	Wintering				1,000S													-	-	-	-

BIRDS (continued)

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
						J	F	M	A	M	J	J	A	S	O	N	D				
	Waterfowl	Canada goose	Wintering		1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering		10S													-	-	-	-
	Waterfowl	Mallard	Wintering		10S													-	-	-	-
	Waterfowl	Mergansers	Wintering		100S													-	-	-	-
	Waterfowl	Scoters	Wintering		100S													-	-	-	-
	Waterfowl	Snow goose	Wintering		1,000S													-	-	-	-
1129	Diving	Common loon	Wintering		Present													-	-	-	-
	Diving	Grebes	Wintering		10S													-	-	-	-
	Diving	Red-throated loon	Wintering		10S													-	-	-	-
	Waterfowl	Brant	Wintering		1,000S													-	-	-	-
	Waterfowl	Bufflehead	Wintering		1,000S													-	-	-	-
	Waterfowl	Gadwall	Wintering		10S													-	-	-	-
	Waterfowl	Mallard	Wintering		10S													-	-	-	-
	Waterfowl	Mergansers	Wintering		100S													-	-	-	-
	Waterfowl	Scoters	Wintering		100S													-	-	-	-
	Waterfowl	Snow goose	Wintering		1,000S													-	-	-	-
1130	Diving	Common loon	Wintering		Present													-	-	-	-
	Diving	Red-throated loon	Wintering		10S													-	-	-	-
	Waterfowl	Brant	Wintering		1,000S													-	-	-	-
	Waterfowl	Bufflehead	Wintering		1,000S													-	-	-	-
	Waterfowl	Mallard	Wintering		10S													-	-	-	-
	Waterfowl	Mergansers	Wintering		100S													-	-	-	-
1269	Gull/Tern	Forster's tern	Nesting		15 Pairs													May-Jul	-	-	-
	Gull/Tern	Laughing gull	Nesting		3 Pairs													Apr-Aug	-	-	-
1324	Shorebird	American oystercatcher	Wintering		-													-	-	-	-

FISH

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Spawn	Eggs	Larvae	Juveniles Jan-May	Adults Sep-Dec
						J	F	M	A	M	J	J	A	S	O	N	D					
1607	Diadromous	American eel	Migration		-													-	-	-	-	-

REPTILES & AMPHIBIANS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA S F	Concentration	Monthly Presence												Nest	Hatch	Internest	Juveniles	Adults
						J	F	M	A	M	J	J	A	S	O	N	D					
1762	Turtle	Diamondback terrapin	Concentration Area		High													May-Aug	-	-	Apr-Oct	Apr-Oct
1775	Turtle	K. ridley sea turtle	General Distribution	E/E	Uncommon													-	-	-	Nov-Dec	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	Common													-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	Abundant													-	-	-	Apr-Oct	Apr-Oct
	Turtle	Loggerhead sea turtle	General Distribution	T/T	Common													-	-	-	Nov-Dec	Nov-Dec
1778	Turtle	Green sea turtle	General Distribution	T/T	Rare													-	-	-	Jul-Oct	-
	Turtle	K. ridley sea turtle	General Distribution	E/E	Rare													-	-	-	Apr-Oct	-
	Turtle	Loggerhead sea turtle	General Distribution	T/T	Common													-	-	-	May-Nov	May-Nov

INVERTEBRATES

Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Monthly Presence												Eggs	Larvae	Juveniles	Adults	
				S	F	Concentration	J	F	M	A	M	J	J	A	S	O	N					D
1790	Insect	Monarch butterfly	Migration			-													-	-	-	Sep-Nov
1830	Bivalve	Eastern oyster	Harvest Area			-													Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
1833	Insect	NE beach tiger beetle	Vulnerable Occurrence	E/T	T	-													Jun-Aug	Jan-Dec	-	Jun-Aug





MARINE MAMMALS

MARINE MAMMALS




Map ID	Subelement	Species	Mapping Qualifier	MD/VA		Concentration	Monthly Presence												Mating	Calving	Pupping	Molt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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1848	Whale	N.A. right whale	General Distribution	E/E	E	Rare																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													</

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

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


FISH

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



REPTILES & AMPHIBIANS

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

INVERTEBRATES






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

MARINE MAMMALS

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

ALSO PRESENT IN MAPPED AREA (GENERAL DISTRIBUTION)



BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Molt
		J	F	M	A	M	J	J	A	S	O	N	D				
	Brown pelican													-	-	-	-
	Brown pelican													-	-	-	-
	D. crested cormorant													-	-	-	-
	D. crested cormorant													-	-	-	-
	Forster's tern													-	-	-	-
	Gulls													-	-	-	-
	Terns													-	-	-	-
	Saltmarsh sharp-tailed sparrow													May-Aug	-	-	-
Passerine																	
	Shearwaters													-	-	-	-
	Storm-petrels													-	-	-	-
	Phalaropes													-	-	-	-
	Willet													May-Jul	-	-	-
Wading														Apr-Sep	-	-	-
	Clapper rail													-	-	-	-
	Wood duck													Apr-Jul	-	-	Jul-Aug




Delmarva Peninsula: Map 87A

FISH


Monthly Presence

Subelement	Species	J	F	M	A	M	J	J	A	S	O	N	D	Spawn	Eggs	Larvae	Juveniles	Adults
	Alewife													-	-	-	Mar-Jun	Mar-Jun
	Alewife													Feb-Apr	Feb-Apr	Feb-Apr	Apr-Oct	Feb-Apr
	Alewife													-	-	-	Aug-Nov	Feb-Jun
	American eel													-	-	-	Jan-May	Jan-Dec
	American shad													-	-	-	Aug-Nov	Feb-Jul
	American shad													-	-	-	Aug-Nov	Apr-Jun
	Blueback herring													-	-	-	Aug-Nov	Feb-Jul
	Blueback herring													Mar-Jun	Mar-Jun	Apr-Jun	May-Oct	Mar-Jun
	Blueback herring													-	-	-	Apr-Oct	Apr-Jun
	Gizzard shad													Mar-Jun	-	-	Jan-Dec	Jan-Dec
	Hickory shad													-	-	-	Jun-Oct	Feb-Jun
	Hickory shad													-	-	-	Feb-Sep	Feb-Sep
	Striped bass													-	-	-	-	Jan-Dec
	Striped bass													-	-	-	May-Oct	Jan-Dec
	Striped bass													-	-	-	Jan-Dec	Jan-Dec
	Atl. sharpnose shark													-	-	-	-	May-Oct
	Atlantic croaker													-	-	-	Aug-Dec	May-Nov
	Atlantic croaker													-	-	Dec-Apr	Jan-Dec	May-Nov
	Atlantic croaker													-	-	Apr-Dec	Jan-Dec	May-Oct
	Atlantic herring													-	-	-	Feb-Jun	Feb-Jun
	Atlantic menhaden													-	-	-	May-Nov	May-Oct
	Atlantic menhaden													-	-	-	Jan-Dec	Jan-Dec
	Atlantic menhaden													-	-	-	Jan-Dec	May-Oct
	Black drum													-	-	-	-	Apr-Oct
	Black drum													Apr-Jun	-	-	Apr-Dec	Apr-Dec
	Black drum													-	-	-	May-Oct	Jan-Dec
	Black sea bass													Jun-Oct	-	-	Apr-Oct	Apr-Oct
	Black sea bass													-	-	-	Apr-Nov	Apr-Nov
	Black sea bass													-	-	-	Apr-Dec	Apr-Dec
	Bluefish													-	-	-	May-Nov	Apr-Nov
	Bluefish													-	-	-	May-Oct	May-Oct
	Kingfishes													-	-	-	-	Apr-Nov
	Kingfishes													Apr-Sep	-	-	-	Apr-Oct
	Mullet													-	-	-	May-Nov	May-Nov
	Northern puffer													-	-	-	-	Jan-Dec
	Northern puffer													-	-	-	Mar-Oct	Mar-Oct
	Northern puffer													-	-	-	Mar-Oct	Mar-Nov
	Pigfish													-	-	-	-	Apr-Nov
	Pinfish													-	-	-	May-Oct	-
	Red drum													-	-	-	Aug-Sep	May-Nov
	Red drum													-	-	-	-	May-Nov
	Sheepshead													-	-	-	Apr-Oct	Apr-Oct
	Sheepshead													-	-	-	-	Apr-Nov
	Spot													-	-	-	Apr-Nov	Jul-Sep

FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Spot													-	-	Dec-Apr	Mar-Nov	Mar-Nov
	Spot													-	-	-	Nov-Apr	Apr-Dec
	Spotted seatrout													May-Jul	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	-	Apr-Nov	Apr-Nov
	Summer flounder													-	-	Feb-May	Apr-Dec	Jan-Dec
	Summer flounder													-	-	Oct-May	-	Apr-Oct
	Weakfish													Apr-Aug	-	-	Mar-Oct	Apr-Oct
	Weakfish													-	-	May-Aug	Jun-Dec	Apr-Dec
	Weakfish													Apr-Aug	-	May-Aug	Apr-Nov	Apr-Nov
	White perch													Mar-May	Mar-May	Apr-May	May-Dec	Jan-Dec
	Winter flounder													-	-	-	-	Dec-Mar
	Winter flounder													Feb-Mar	-	-	Jan-Dec	Feb-Mar
	Winter flounder													Mar-Sep	Mar-Sep	Mar-Sep	Jan-Dec	Feb-Mar
	Killifish													-	-	-	Jan-Dec	Jan-Dec
	Pipefish													-	-	-	-	Jan-Dec
	Silversides													-	-	-	-	Jan-Dec
	Silversides													Mar-Jul	Mar-Jul	Apr-Sep	Jan-Dec	Jan-Dec
	Anchovies													Apr-Sep	-	-	-	Jan-Dec
	Anchovies													-	-	-	-	May-Nov
	Anchovies													Apr-Sep	Apr-Sep	Apr-Oct	Jan-Dec	Jan-Dec
	Great hammerhead													-	-	-	-	May-Oct
	Striped burrfish													-	-	-	-	May-Oct
	Atlantic angel shark													-	-	-	-	Jan-Dec
	Atlantic spadefish													-	-	-	-	Jun-Sep
	Atlantic spadefish													-	-	-	May-Oct	May-Oct
	Cleannose skate													-	-	-	-	Jan-Dec
	Cownose ray													Jun-Jul	-	-	May-Oct	May-Oct
	Cownose ray													-	-	-	-	Jan-Dec
	Northern searobin													-	-	-	-	Mar-Oct
	Northern searobin													May-Jul	-	-	-	Apr-Dec
	Northern searobin													-	-	-	Apr-Oct	Apr-Oct
	Northern stargazer													-	-	-	Apr-Nov	Apr-Nov
	Red hake													-	-	-	-	Sep-May*
	Red hake													-	-	-	Feb-May	Sep-Nov
	Silver hake													-	-	-	-	Oct-May
	Smooth butterfly ray													-	-	-	May-Oct	May-Oct
	Smooth dogfish													May-Sep	-	-	-	Apr-Oct
	Smooth dogfish													-	-	-	-	May-Oct
	Southern stingray													-	-	-	-	Jan-Dec
	Southern stingray													-	-	-	-	May-Oct
	Spotted hake													-	-	-	Jan-Dec	Jan-Dec
	Spotted hake													-	-	-	Mar-Jun	Mar-Nov*
	Spotted hake													-	-	-	Oct-Jun	-
	Striped cusk-eel													-	-	-	May-Oct	-





FISH (continued)

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Tautog													Apr-Aug	-	-	-	Jan-Dec
	Tautog													-	-	-	Jan-Dec	Jan-Dec
	Atlantic mackerel													-	-	-	-	Mar-Apr
	Blacktip shark													-	-	-	-	May-Oct
	Butterfish													-	-	-	Jul-Nov	Mar-Nov
	Butterfish													-	-	-	May-Oct	-
	Cobia													-	-	-	-	Jun-Sep
	Crevalle jack													-	-	-	Jun-Oct	-
	Dusky shark													-	-	-	-	May-Oct
	Great white shark													-	-	-	-	Jan-Dec
	Harvestfish													-	-	-	-	May-Nov
	Lined seahorse													May-Oct	-	-	-	Jan-Dec
	Lined seahorse													Jun-Sep	Jun-Sep	-	May-Oct	May-Oct
	Sand tiger shark													-	-	-	-	May-Oct
	Sandbar shark													-	-	-	May-Oct	May-Oct
	Scalloped hammerhead													-	-	-	May-Sep	May-Oct
	Scalloped hammerhead													-	-	-	May-Oct	May-Oct
	Spanish mackerel													-	-	-	-	May-Sep
	Spinner shark													-	-	-	-	May-Oct
	Spiny dogfish													-	-	-	Nov-May	Nov-May
	Thresher shark													-	-	-	-	May-Sep



REPTILES & AMPHIBIANS

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



INVERTEBRATES

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Eastern oyster													Jun-Sep	Jun-Sep	Jun-Oct	Jan-Dec	Jan-Dec
	Hard clam													May-Oct	May-Oct	May-Oct	Jan-Dec	Jan-Dec
	Squid													-	-	-	-	Jan-Dec
	Squid													-	Apr-Dec	Apr-Dec	Apr-Dec	Apr-Dec
	Atlantic rock crab													-	-	-	-	Jan-Dec
	Blue crab													-	-	May-Nov	Jan-Dec	Jan-Dec
	Blue crab													-	-	-	Jan-Dec	Jan-Dec
	Hermit crab													-	-	-	-	Jan-Dec
	Horseshoe crab													Apr-Aug	Apr-Aug	-	Jan-Dec	Jan-Dec
	Horseshoe crab													-	-	-	Jan-Dec	Jan-Dec
	Lady crab													-	-	-	-	Jan-Dec
	Spider crabs													-	-	-	Jan-Dec	Jan-Dec
	Channelled whelk													-	-	-	Jan-Dec	Jan-Dec

INVERTEBRATES (continued)

Subelement	Species	Monthly Presence												Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D				
 Lobster	Knobbed whelk													-	-	Jan-Dec	Jan-Dec
	American lobster													-	-	-	May-Nov
 Shrimp	Brown shrimp													-	May-Jun	May-Oct	May-Oct
	Brown shrimp													-	-	May-Oct	May-Oct
	Grass shrimp													May-Sep	Jun-Sep	Jan-Dec	Jan-Dec
	Mantis shrimp													-	-	Jan-Dec	Jan-Dec
	Sand shrimp													May-Sep	Jun-Sep	Jan-Dec	Jan-Dec
	White shrimp													-	-	May-Oct	May-Oct

MARINE MAMMALS

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

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

ESI POLYGON HABITAT TYPES

<i>ESI Rank</i>	<i>Habitat Classification</i>	<i>Area (Acres)</i>	<i>Area (Sq. Miles)</i>
10A	Salt and Brackish Water Marshes	1,429.98	2.23
10B	Freshwater Marshes	12.50	0.02
10C	Swamps	85.56	0.13
10D	Scrub and Shrub Wetlands	56.55	0.09
9A	Sheltered Tidal Flats	2.63	0.00
7	Exposed Tidal Flats	7.22	0.01

ESI SHORELINE HABITAT TYPES

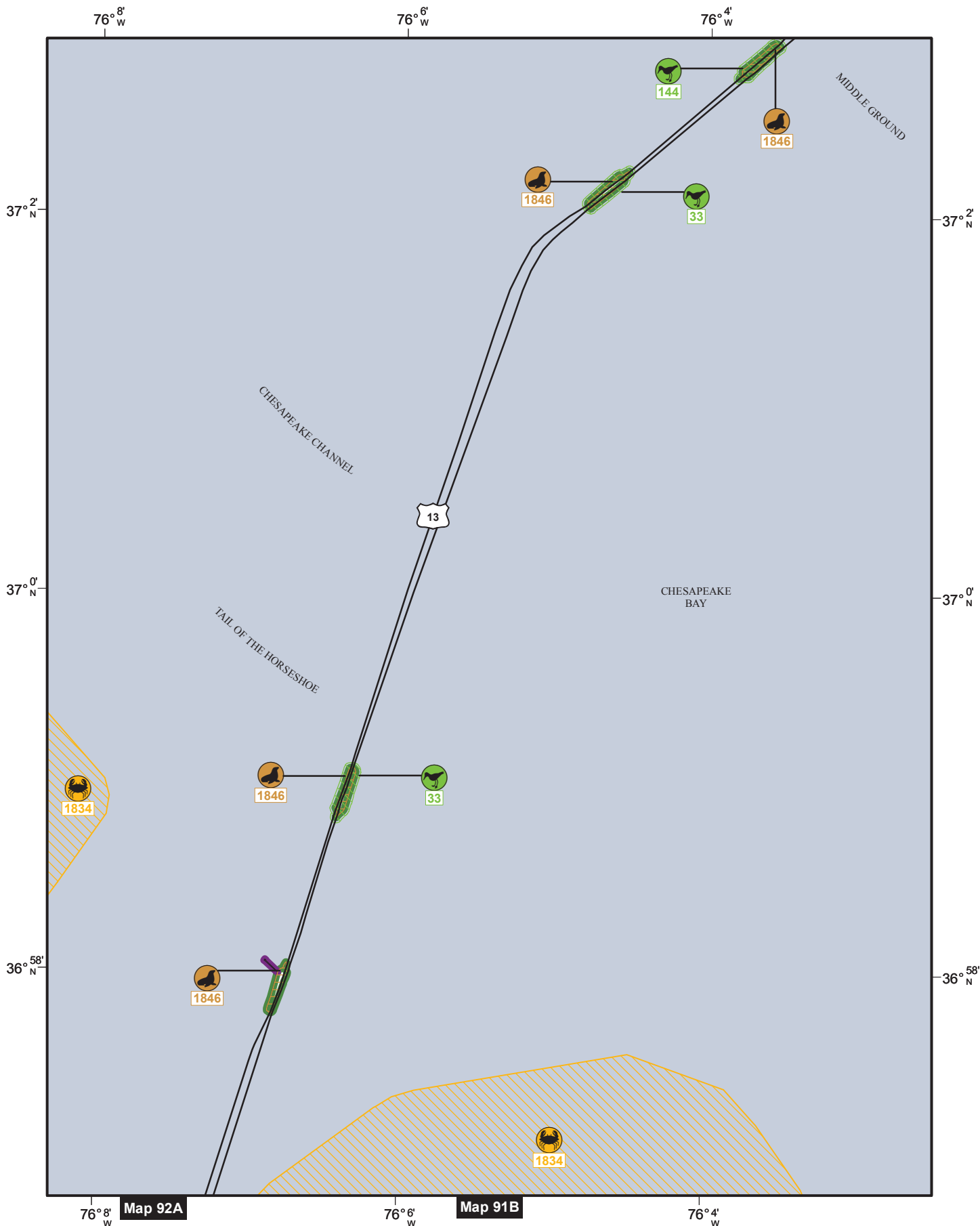
<i>ESI Rank</i>	<i>Shoreline Habitat Classification</i>	<i>Length (Meters)</i>	<i>Length (Miles)</i>	<i>% of ESI Shoreline</i>
10A	Salt and Brackish Water Marshes	49,495.21	30.75	42%
10D	Scrub and Shrub Wetlands	243.30	0.15	< 1%
9A	Sheltered Tidal Flats	42,447.25	26.38	36%
8B	Sheltered, Solid Man-Made Structures	159.13	0.10	< 1%
7	Exposed Tidal Flats	3,091.69	1.92	3%
6B	Riprap	1,812.35	1.13	2%
3A	Fine to Medium Grained Sand Beaches	19,482.07	12.11	17%
3B	Scarps and Steep Slopes (Sand)	1,094.10	0.68	1%
1B	Exposed, Solid Man-Made Structures	128.71	0.08	< 1%

Total ESI Shoreline: 117,953.81 Total ESI Shoreline: 73.29
 Total Shoreline: 63,595.82 Total Shoreline: 39.52

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

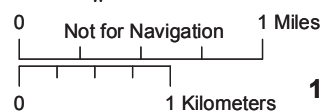


Map 87B

Delmarva Peninsula



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



1:50,000



Map 87B
Delmarva Peninsula

BIOLOGICAL RESOURCES

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

DISPLAYED ON MAP

BIRDS

Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Nest	Eggs	Larvae	Juveniles	Adults
								J	F	M	A	M	J	J	A	S	O	N	D					
33	Shorebird	American oystercatcher	Nesting				1 Pair													Apr-Aug	-	-	-	-
144	Shorebird	American oystercatcher	Roosting				1 Pair													-	-	-	-	-

INVERTEBRATES




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

MARINE MAMMALS



Map ID	Subelement	Species	Mapping Qualifier	MD/VA	S	F	Concentration	Monthly Presence												Mating	Calving	Pupping	Molt
								J	F	M	A	M	J	J	A	S	O	N	D				
1846	Pinniped	Gray seal	Haul Out				Rare													-	-	-	-
	Pinniped	Harbor seal	Haul Out				Common													-	-	-	-

WIDESPREAD IN MAPPED AREA (> 10 SQUARE KILOMETERS)


BIRDS

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

FISH

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


REPTILES & AMPHIBIANS

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

INVERTEBRATES

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






MARINE MAMMALS

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


BIRDS

Subelement	Species	Monthly Presence												Nest	Mig.(S)	Mig.(F)	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	Brown pelican													-	-	-	-	-
	D. crested cormorant													-	-	-	-	-
	Gulls													-	-	-	-	-
	Terns													-	-	-	-	-
	Shearwaters													-	-	-	-	-
	Storm-petrels													-	-	-	-	-
	Phalaropes													-	-	-	-	-



FISH

Subelement	Species	Monthly Presence												Spawn	Eggs	Larvae	Juveniles	Adults
		J	F	M	A	M	J	J	A	S	O	N	D					
	American eel													-	-	-	-	-
	Gizzard shad													Mar-Jun	-	-	-	-
	Striped bass													-	-	-	-	-
	Atlantic croaker													-	-	-	-	-
	Atlantic herring													-	-	-	-	-
	Atlantic menhaden													-	-	-	-	-
	Black drum													Apr-Jun	-	-	-	-
	Black sea bass													-	-	-	-	-
	Bluefish													-	-	-	-	-
	Kingfishes													-	-	-	-	-
	Northern puffer													-	-	-	-	-
	Pigfish													-	-	-	-	-
	Red drum													-	-	-	-	-
	Sheepshead													-	-	-	-	-
	Spot													-	-	-	-	-
	Spotted seatrout													May-Jul	-	-	-	-
	Summer flounder													-	-	-	-	-
	Weakfish													-	-	-	-	-
	Winter flounder													-	-	-	-	-
	Pipefish													-	-	-	-	-
	Silversides													-	-	-	-	-
	Anchovies													Apr-Sep	-	-	-	-
	Striped burrfish													-	-	-	-	-
	Atlantic spadefish													-	-	-	-	-
	Cleannose skate													-	-	-	-	-
	Cownose ray													-	-	-	-	-
	Northern searobin													Jun-Jul	-	-	-	-
	Red hake													May-Jul	-	-	-	-
	Silver hake													-	-	-	-	-
	Southern stingray													-	-	-	-	-
	Spotted hake													-	-	-	-	-



FISH (continued)

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

INVERTEBRATES

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

MARINE MAMMALS

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

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

SHORELINE RESOURCES

ESI POLYGON HABITAT TYPES

ESI Rank	Habitat Classification	Area (Acres)	Area (Sq. Miles)
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ESI SHORELINE HABITAT TYPES

ESI Rank	Shoreline Habitat Classification	Length (Meters)	Length (Miles)	% of ESI Shoreline
6B	Riprap	4,486.34	2.79	93%
1B	Exposed, Solid Man-Made Structures	361.15	0.22	7%

Total ESI Shoreline: 4,847.49
Total Shoreline: 4,847.49
































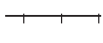



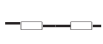




Total ESI Shoreline: 3.01
Total Shoreline: 3.01

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











































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



Human-Use Features

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

ESI Shoreline and Habitat Ranking

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








































Examples of Double and Triple Shoreline Rankings:

 10D & 2A

 10C & 10A & 4

Shorelines often contain varied geomorphology, and therefore may require two or three ESI types to describe. These symbols will look similar to the examples above. The first shoreline type listed is the most landward shore type.

Sensitive Biological Resources

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

Guidelines for Interpreting Environmental Sensitivity Index (ESI) Maps

The following guidelines may help map users interpret the ESI maps. Additional information about resources mapped for this atlas can be found in the ESI Intro pages and associated metadata.

Sensitive Biological Resources (1:50,000 scale maps): Species are arranged into eight major categories or "elements" and further subdivided into "subelement" groupings representing species that share similar lifestyle characteristics and risks to oiling.

Biological resources may be mapped as points, lines, and/or polygons. Each element is represented by a unique color and/or hatch pattern, and icons illustrate the subelement(s) found within each feature. If a species is state or federally listed as threatened or endangered, a solid red square is placed behind the icon. When multiple elements occur in the same location, overlapping hatch patterns will be shown.

The associated Map ID "links" to the map report where the species and attributes are listed. To maximize readability, biological polygons covering more than 10 square km are not displayed on the map. Instead, these species are listed in the "Widespread in Mapped Area" section of the report. Occurrences of non-listed species assigned a "General Distribution" mapping qualifier are listed under "Also Present in Mapped Area" regardless of polygon size.

Shoreline Habitat Resources (all maps): The shoreline was mapped at mean-high water, then classified based on vulnerability to spilled oil and ease of clean-up. Shorelines are ranked on a scale from 1 (least vulnerable) to 10 (most vulnerable). Cooler colors represent less vulnerable shoreline types; warm and hot colors indicate increased vulnerability. A shoreline may have more than one habitat type present. When this happens, the most landward shoreline type is mapped on the shoreline, and the more seaward type(s) are mapped adjacent to the water. The areal extent of intertidal and marsh habitats may also be mapped as polygons. Most often these polygons represent tidal flats and marshes, though in particularly rocky shored areas, these may include exposed, wave-cut platforms and sand and gravel beaches.

Human-Use Features (1:100,000 scale maps): Locations of human-use features and jurisdictional boundaries are mapped as points, lines, or polygons. As with biological features, the human-use features appearing on the map include Map ID which "links" to a description of the feature in the map report. Additional features, particularly jurisdictional and management boundaries that cover the majority or entirety of the mapped area, are listed in the report, but not shown on the map.

