

Natural Heritage – Locality Liaison/Habitat Restoration

Final Report for FY2011 VCZMP Grant No. NA11NOS4190122 Task #7

November 15, 2012

By Rene' Hypes and Alli Baird

*Virginia Department of Conservation and Recreation –
Division of Natural Heritage*



This project was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant # NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

TABLE OF CONTENTS

Executive Summary	page 1
Introduction	page 3
Staffing	page 3
Environmental Review	page 3
Natural Heritage Data Explorer Internet Website	page 6
Locality Partnerships with DCR-Natural Heritage	page 8
List of Participants in Presentations	page 8
Habitat Restoration and Protection Initiatives	page 9
Recommendations for Future Actions	page 11
Appendix	
Letter Fort Belvoir (BRAC)	A
Letter for NASA Wallops Goddard Flight Facility	B
Letter for Presquile NWR Comprehensive Conservation plans	C
Letter for Route 5 Capital to Capital Trail	D
Letter for National Park Service Management Plan	E
Natural Heritage Data Explorer Update	F
Accomack County Comprehensive Plan Information Provided	G
Map of Localities with Natural Heritage Information	H
Wetland Restoration Catalog	I
Coastal Virginia Ecological Value Assessment (VEVA)/Landscape Chesapeake	J

Executive Summary

During the 2011 grant year, the Locality Liaison reviewed 914 projects for impacts to natural heritage resources in the coastal zone (43% of the projects reviewed statewide). Fort Belvoir continued to have numerous projects as a result of the Base Re-alignment and Closure Act (BRAC), including recreational lodging, a car wash, fire station, chapel, road and utility upgrades and Army lodging privatization. The U. S Fish and Wildlife Service continues to develop comprehensive conservation plans for their wildlife refuges and requested information on natural heritage resources for both Presquile and Chincoteague National Wildlife Refuges. In addition, continued activity at NASA's Flight Facility on Wallops Island included preparation of a facility master plan and development of an unmanned aerial system airstrip, which, because of impacts to a globally rare natural community, required extensive discussions with NASA staff.

Many presentations were given to localities and other conservation partners including Essex and James City counties and the cities of Suffolk and Virginia Beach, Hampton Roads PDC, Newport News Green Foundation, the Eastern Shore Land Trust, the Center for Forest & Wood Conservation, George Mason University, Virginia Department of Health, DCR - Land Conservation and the Naval Facilities Engineering Command Mid-Atlantic. In addition, eight consultants were trained: Mill Creek Environmental Consultants; Skelly & Loy, Inc.; Dominion Due Diligence Group; Biological Integrity, LLC; Entrex Communications; Dewberry; Vanasse, Hangen, Brustlin, Inc.; and Christopher A. Lund, P.E. Presentations included an overview of DCR's Natural Heritage Program, the Locality Assistance Program, the Natural Heritage Data Explorer (NHDE) website, the Virginia Conservation Lands Needs Assessment (VCLNA), the Land Conservation Data Explorer (LCDE) website, the Virginia Ecological Value Assessment (Coastal VEVA), and the Wetland Restoration Catalog as well as other conservation tools. Natural Heritage information is updated quarterly on the NHDE website and shapefiles including that information are distributed to all licensed participants.

The Locality Liaison provided language, tables and Conservation Sites maps to Accomack, Hanover, Chesterfield, Gloucester, King George and King William counties and the cities of Chesapeake and Williamsburg for use in their comprehensive plans or supporting implementation documents.

On April 19, 2012, the Locality Liaison provided natural heritage information for Fort A. P. Hill in Caroline County at the Army's Earth Day Event on site for several hundred students and teachers.

DCR-DNH has received funding from the Natural Resources Conservation Service (NRCS) and matched funds from the Department of Transportation to update, modify and expand the Virginia Wetlands Catalog using a revised methodology identifying more opportunities for wetland and stream mitigation that was developed for an 11-subwatershed pilot area of the Pamunkey River.

The Coastal Virginia Ecological Value Assessment (Coastal VEVA) has been incorporated into Landscape Chesapeake, the first regional section of Landscape, that is dedicated to conservation within the Chesapeake Bay watershed. Landscape is supporting collaboration among the many

entities that have identified priorities within the watershed by sharing map data related to the overall priority of conserving landscapes.

The DCR-DNH has worked with NatureServe to update the Natural Heritage Data Explorer (NHDE) website and is in the final stages of development, with Beta testing projected to begin in December 2012. The new site will be on an ArcServer platform and have enhanced functionality for both the general public and subscription users. In addition, the new NHDE will serve as a model for other Natural Heritage programs in other states to develop similar tools with NatureServe.

Introduction

Through the Locality Liaison program, the Virginia Department of Conservation and Recreation's Division of Natural Heritage (DCR-DNH) works with local and regional planners to assist them in fully utilizing natural heritage resource information as well as the consultative services we provide to ensure protection of natural heritage resources. The Locality Liaison program seeks to establish natural heritage resource information as part of fundamental locality decision-making criteria through tools such as project review, comprehensive planning, project sitings, zoning amendments, and open space planning.

Virginia Coastal Zone Management Program (VCZMP) and the Chesapeake Bay Program initiatives have generated considerable interest in land use issues within the Coastal Zone. In addition, the Bay Total Maximum Daily Load (TMDL) program is encouraging localities to incorporate green infrastructure into their land planning. Coastal localities are developing conservation objectives, identifying potential areas for protection and looking at innovative approaches in making land use decisions that will lessen the trend toward urban sprawl. The Locality Liaison program is working to have natural heritage resources play a larger role in helping localities find beneficial answers to the problems and opportunities they face.

Staffing

Alli Baird currently serves as the Coastal Zone Locality Liaison (Locality Liaison) and reviews projects within the coastal zone with assistance from other environmental review staff. Rene' Hypes (Environmental Review Coordinator) provides general oversight for all projects reviewed within the Coastal Zone. Numerous other DCR-DNH staff members also support the Locality Liaison program, including Data Manager Megan Rollins, Information Manager Jason Bulluck, Project Review Assistants, and various Natural Heritage biological inventory personnel.

Environmental Review

The DCR-DNH Environmental Review Section, to which the Locality Liaison is assigned, works with local, state, and federal government agencies as well as private individuals and consultants to assess the potential for proposed activities to impact natural heritage resources and to recommend ways to avoid or minimize these impacts. The Locality Liaison has primary responsibility for reviewing projects in the Coastal Zone. She conducts the review for Coastal Zone projects and provides oversight for the Project Review staff assisting in the review process. During this grant year DCR-DNH has reviewed 914 projects in the Coastal Zone. This represents 43% of the projects reviewed statewide by DCR-DNH.

Through environmental review, the Locality Liaison provides service in connecting clients directly to needed information about natural heritage resources. With the state's most comprehensive database for rare, threatened and endangered species and significant natural communities, environmental review provides an opportunity for cooperating with other organizations. Many private consultants routinely and voluntarily coordinate with DCR-DNH before taking development project applications to regulatory agencies. Though DCR-DNH does

not have regulatory authority, we have agreements with regulatory agencies that rely on our natural heritage resource data. The United States Army Corps of Engineers (ACOE) and the Department of Environmental Quality (DEQ) Virginia Water Protection Permit Program (VWPP) screen all wetland development projects against our database and forward potential conflicts for our comment. The DEQ Virginia Pollutant Discharge Elimination System (VPDES) program also screens issuance and re-issuances of permits for point source discharges to surface waters against our database, and the Virginia Department of Health screens for issuance or re-issuance of pump-out as part of their permitting process. The United States Fish and Wildlife Service (USFWS) also relies heavily on DCR-DNH data for their own regulatory responses. The USFWS Information, Planning, and Conservation (IPaC) System web site on-line screening process includes DCR-DNH species distribution models and references the Natural Heritage website for species coordination purposes.

The DCR-DNH has an updated Memorandum of Agreement with the Virginia Department of Game and Inland Fisheries (VDGIF) for sharing of data and species coordination between the two agencies. In addition to regulatory agencies, the Virginia Department of Transportation (VDOT) integrates Natural Heritage data into their internal database for environmental screening purposes.

Specific Projects

Fort Belvoir

Fort Belvoir has continued to develop projects as a result of the Base Re-alignment and Closure Act (BRAC). In addition to continuing projects from the prior grant year, this year included two projects, the 300 Area Water Upgrades (Appendix A) and the Alternate Implementation of Privatization of Army Lodging, that were proposed adjacent to or within the Area T-17 Ravine Conservation Site where the only known extant occurrence of the Northern Virginia well amphipod in the world has been documented. The Woodlawn Chapel and Franklin Road Water Upgrades, FHA Route 1 Improvement, Car Wash Facility, South Post Fire Station, and Belvoir Corporate Campus, were adjacent to or within the Pohick/Accotink Conservation site where River bulrush, the historically documented occurrences of Laura's Clubtail and the Wood turtle could be impacted by changes in water quality as a result of these projects.

As a result of comments on these multiple projects, Fort Belvoir contracted the Division of Natural Heritage to conduct an inventory for mussels, odonates, bats, Lepidoptera, Sensitive joint-vetch, Small whorled pogonia and the Northern well amphipod on the base. The surveys began in September of 2011 and have continued through the FY11 grant year.

NASA, Wallops Flight Facility, Wallops Island

Numerous projects on Wallops Island were reviewed for potential impacts to natural heritage resources. Several projects on the main base at Wallops included a preliminary EA for the improvements to the landing airstrip for field carrier landing practice, and upgrades at the Wallops Command and Data Acquisition Station. The both upgrades had the potential to impact

a Tidal Oligohaline Marsh, several rare plants and Bald eagle nesting sites. To minimize impacts, DCR-DNH recommended avoidance and adherence to erosion and sediment control and storm water management regulations.

NASA also submitted a Draft Environmental Assessment (EA) for the construction and operation of an Unmanned Aerial Systems airstrip at the north end of Wallops Island. As part of a preliminary review in preparation for the draft EA document, DCR-DNH had recommended that the proposed airstrip be relocated to avoid impacts to a globally rare community and state rare plants, and that a study be conducted to evaluate the impacts to threatened and endangered as well as migratory and colonial birds documented in the vicinity of the project. As a follow-up to DCR-DNH comments, the environmental staff at NASA Goddard Flight Facility requested access to natural heritage digital data and contracted DCR-DNH to perform a re-inventory of resources at the north end of Wallops Island where several rare birds, natural communities and plants have been documented. The inventory located the existing boundaries of the rare community and discovered a rare plant occurrence within the project boundaries.

In the Draft EA, the location of the airstrip was not substantially altered nor were impacts minimized to the documented natural heritage resources. In discussions between DCR-DNH and NASA, NASA agreed to consider several alternatives including different locations, different configuration and minimization of any impacts, as well as looking at potential mitigation measures for the natural heritage resources at the site.

As a result of further discussions between NASA and DCR-DNH, the Final EA included establishment of research areas on the north end of Wallops Island, development and implementation of an invasives species management plan, maintenance of habitat for the rare plant, continued monitoring of the peregrine falcon and bald eagle nests, as well as annual monitoring of shorebirds for disturbances by aircraft. (Appendix B)

U. S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) continues to update the comprehensive conservation plans for their wildlife refuges.

Presquile National Wildlife Refuge Draft Comprehensive Conservation Plan

According to the information in the DCR-DNH database, Bald eagles and Sensitive joint-vetch have been documented within the Presquile National Wildlife Refuge (NWR) boundaries. Additionally, Atlantic sturgeon has been documented in the James River in the project vicinity. In order to incorporate accurate information into the conservation plans, DCR-DNH recommended an updated survey for rare, threatened and endangered species and natural communities be conducted prior to the development of management plans for these resources. Furthermore, DCR-DNH recommended that an invasive species plan be developed and implemented within the refuge. (Appendix C)

Chincoteague National Wildlife Refuge Comprehensive Conservation Plan

DCR-DNH provided a table of all documented natural heritage resources within the refuge and offered to provide the U. S. Fish and Wildlife Service and the National Park Service with digital information for resources in the refuge. DCR-DNH also recommended a re-survey of the refuge in order to accurately document the current location and extent of natural heritage resources for use in their planning efforts. Additionally, DCR-DNH supported efforts to maintain lands to maximize habitat and wildlife management strategies for rare, threatened and endangered species, migratory birds and resident wildlife in all of the proposed alternatives.

Virginia Department of Transportation

Route 5 Capital to Capital Trail

The Virginia Department of Transportation continues to develop the Route 5 Capital to Capital Trail from Richmond to Williamsburg, and DCR-DNH reviewed three sections of the trail for impacts to natural heritage resources. DCR-DNH recommended coordination with VDGIF for potential impacts to bald eagles within the Sherwood Forest Phase and the CCH East sections. In addition, DCR-DNH recommended adherence to erosion and sediment control and storm water management laws and regulations to avoid potential impacts to a Tidal Freshwater Marsh in the Sherwood Phase of the project, and to an Aquatic Natural Community and historic documentation of Laura's clubtail in the James River downstream of the Varina Phase of the trail. (Appendix D)

National Park Service

Manassas National Battlefield White-tailed Deer Management Plan

DCR-DNH has documented several rare plants, terrestrial communities, an aquatic natural community and a state endangered mussel within the Manassas National Battlefield. DCR-DNH recommended coordination with VDGIF for compliance with protected species legislation for the endangered mussel. DCR-DNH also supported efforts by the National Park Service to reduce White-tailed deer herds to within the carrying capacity of the Manassas National Battlefield Park to preserve and protect the natural heritage resources within the park boundaries. (Appendix E)

Natural Heritage Data Explorer Internet Website

The heart of DCR-DNH's service to localities is the set of databases and information tools that indicate what's rare, where the rarities are, and how they can be protected. DCR-DNH databases contain information about approximately 9,609 specific occurrences of natural heritage resources, 2,950 of which reside in the coastal zone. Over the years, DCR-DNH has continually worked to improve the quality of the data and the utility of the tools used to present the data to researchers, planners, and decision-makers. All DCR-DNH data has been converted to modified polygons within the GIS system. Conservation sites are now the primary mechanism for distributing natural heritage location information for public use. Conservation sites identify

resources and the habitat they support. They incorporate contextual information about the key areas of the landscape surrounding the actual locations of natural heritage resources that are necessary to ensure protection of those resources. DCR-DNH currently tracks over 2,444 conservation sites, of which 979 are in the coastal zone. These sites are continuously being updated by DCR-DNH staff. The increase of conservation sites from the prior year's report is a consequence of the separation of bald eagle nest sites into individual sites and inclusion of the Virginia Commonwealth University INSTAR (INteractive STream Assessment Resource) data as significant aquatic natural communities. There has also been work in data development to further the concept of conservation sites by forming "building blocks" around natural heritage resource occurrences as well as automating our current conservation site development process.

The Virginia Natural Heritage Data Explorer (NHDE) allows Internet users to access Natural Heritage data on a remote website. This GIS informational tool can alert planners to potential areas of opportunity or concern, facilitate proactive planning for county resources, and allow preliminary screening of projects and activities for potential impacts to natural heritage resources. The natural heritage data on the website is updated quarterly, as updates are released for digital screening coverage shapefiles. The current website can be accessed at www.vanaturalheritageexplorer.org.

The website is being upgraded from the current ArcIMS platform to an ArcServer platform by NatureServe. Development of map services is a part of this upgrade which will make the release of digital data more efficient. In addition, the Land Conservation Data Explorer functionality and the Cold Fusion database search has been incorporated into the new site. Several different levels of access will be available from a public access level to paid licenses with increasing information made available to different Tier level users. Final development should be completed by November with Beta testing beginning in December 2012. (Appendix F)

Hands-on training sessions for the Natural Heritage Data Explorer are generally held on an every-other-month basis. Most are held in Richmond at the DCR-DNH office and are made available through a webinar, facilitating participation by long distance localities and conservation partners. Training is provided by the project review staff, including the Locality Liaison. The general training sessions are open to all organizations, but are divided into three sections according to the user's tier access level. During this grant year, eight hands-on general training sessions for NHDE were held.

At the end of the grant period, there were 36 localities and eight Planning District Commissions within the Coastal Zone using NHDE and/or natural heritage data shapefiles. In addition, fourteen land trusts within the Coastal Zone are using NHDE and/or natural heritage data shapefiles.

Approximately 532 projects have been submitted through NHDE within the FY2011 with 221 for the coastal zone. In addition, 80 projects statewide including 26 in the coastal zone did not have natural heritage resources within two miles of the project location and a report was automatically sent to the requestor stating this information so no further review was required by DCR-DNH staff. NHDE has made project submittal significantly easier for clients as they

receive natural heritage information within minutes and streamlined workflow for DCR-DNH staff by capturing shapefiles of projects submitted through the website.

List of Participants in Locality Liaison Presentations

Presentations included an overview of DCR's Natural Heritage Program, the Locality Assistance Program, the Natural Heritage Data Explorer (NHDE) website, the Virginia Conservation Lands Needs Assessment (VCLNA), the Land Conservation Data Explorer (LCDE), the Wetland Restoration Catalog and Coastal Virginia Ecological Value Assessment (VEVA).

The following localities and conservation partners participated in these training sessions:

- Essex County
- James City County
- City of Suffolk
- City of Virginia Beach
- Hampton Roads PDC
- Newport News Green Foundation
- Eastern Shore Land Trust
- Center for Forest & Wood Conservation,
- George Mason University,
- Virginia Department of Health
- DCR – Land Conservation
- Naval Facilities Engineering Command Mid-Atlantic

Locality Partnerships with DCR-Natural Heritage

The Locality Liaison has worked with localities within the Coastal Zone to encourage comprehensive use of natural heritage data and DCR-DNH services for conservation planning. Also, the Liaison has continued working with other conservation partners such as land trusts and other state agencies.

During this grant year, the Locality Liaison has provided specific language about natural heritage resources to several localities including Accomack County, Hanover County, Chesterfield County, Gloucester County, King George County, King William County, the City of Chesapeake and the City of Williamsburg for use in their comprehensive plan updates. In addition, tables of the resources that have been documented within their locality and maps showing the locations of conservation sites associated with these natural heritage resources were included. Some localities that have expressed interest in incorporating natural heritage information into their upcoming comprehensive plan updates are: Stafford, King and Queen and Spotsylvania Counties.

Accomack is an example of a locality with a high number (241 individuals) of natural heritage resources, of which 105 are unique types. In addition Accomack has 60 conservation sites

identified within the county and four Natural Area Preserves. Because of its wealth of natural heritage resources, it is important that the county be aware of conservation sites and include them in their conservation and green infrastructure planning. Ongoing development can cause loss of habitat, forest fragmentation, introduction of invasive species, disruption of groundwater recharge and impacts to water quality. Additionally the over-withdrawal of groundwater can cause salt-water intrusion to alter habitat as will sea-level rise. Finally, beach stabilization activities have the potential to disrupt habitat by altering natural sand-flow dynamics. Awareness of these issues can help guide development to areas of lesser impact to natural heritage resources and encourage conservation planning. (Appendix G)

At the end of FY2011, there were twenty-five coastal counties and eleven coastal cities with access to NHDE, digital shapefile data, a combination of these tools and/or information within their comprehensive plan. This equates to approximately 82% of Coastal Zone counties or cities having utilizing Natural Heritage data. Please see Appendix H for a map of the Virginia localities with Natural Heritage information. It may also be viewed online at the Locality Liaison web page: http://www.dcr.virginia.gov/natural_heritage/documents/localitiesmap.pdf

The Locality Liaison participated in the Earth Day activities at Fort A.P. Hill, where approximately 400 school children attended. The display consisted of maps and details about the rare natural heritage resources in Caroline County including the Purple pitcher plant, an example of which was on display. Handouts about the natural heritage program and an activity were provided.

Habitat Restoration and Protection Initiatives

Wetland Restoration Catalog

The current Wetland Restoration Catalog contains potential wetland restoration sites that are within or adjacent to Natural Heritage Conservation Sites. This catalog is intended to guide localities and regulatory agencies to appropriate sites for various conservation purposes including wetland mitigation. These sites represent high-probability opportunities to design and implement high-value wetland restoration projects. The Wetland Restoration Catalog is included in the DEQ Coastal Zone Program's Coastal GEMS (<http://128.172.160.131/gems2/>) with an accompanying factsheet.

The Virginia Natural Heritage Program has developed a revised methodology for updating and modifying the Virginia Wetlands Catalog. This methodology identifies more opportunities for wetland and stream mitigation, and guides selection of mitigation opportunities, via a ranking of sites based on multiple datasets. This methodology was developed to apply statewide and was tested in an 11-subwatershed pilot area of the Pamunkey River of Virginia. The methodology first enables the development of an expanded wetlands/streams base layer beyond the National Wetlands Inventory (NWI) that was then prioritized, to assign all areas with a rank of their mitigation value. This rank is based on the likelihood of an identified area being wetland, and an area's contributions to biodiversity conservation and/or water quality. The revised Wetland

Catalog provides a map-based summary of mitigation opportunities ranked from 1-to-5 to clearly indicate their relative value as mitigation sites. All opportunities are tied to sub-watershed and tax parcel IDs in two separate map outputs. (Appendix I)

DCR-DNH has received funding from the Natural Resources Conservation Service (NRCS) to update, modify and expand the Virginia Wetlands Catalog using the revised methodology that identifies more opportunities for wetland and stream mitigation. Matching funds for the grant will be provided by DCR-DNH, Virginia Commonwealth University (VCU), The Nature Conservancy (TNC), and the Virginia Department of Transportation (VDOT). NRCS will use the catalog in its Wetland Reserve program to identify and target the best locations for restoration and protection of wetlands. The projected timeline for completion of the project is spring of 2014.

Coastal Virginia Ecological Value Assessment (VEVA)

The Coastal Virginia Ecological Value Assessment (VEVA) was developed to provide guidance to local governments engaged in land use management and conservation planning. VEVA is a collaborative effort among several state programs to synthesize the best available natural resource information into a single geospatial product. VEVA combines scientific data and best professional judgment to rank terrestrial and aquatic areas for their ecological value. These values can be used to prioritize areas for preservation, develop strategies for special area management actions, or to build awareness about Virginia's natural communities.

Coastal VEVA is incorporated into Coastal GEMS and can be accessed online at: <http://128.172.160.131/gems2/> as well as on Landscape Chesapeake. The Locality Liaison, as part of the NHDE training, shows participants the location of Coastal GEMS and provides information about the Wetlands Restoration Catalog and the VEVA.

Landscape

Landscape is a collaborative project between NatureServe and the National Geographic Society. This online resource for the land conservation community and the public gathers stories, maps, data and photos in order to inform and inspire the conservation community to conserve our lands and waters. Many partners contribute content to encourage natural heritage protection. Virginia is one of five pilot states participating in this effort.

During the past grant cycle, the site has been updated to include all new conservation lands. Featured areas within the coastal zone include Crow's Nest, Savage Neck Dunes, Dameron Marsh and Hughlett Point Natural Area Preserves. The site can be accessed at: <http://www.landscape.org/virginia>. The Locality Liaison includes Landscape as one of the several additional conservation resources available to NHDE training participants.

In addition, Landscape has created a new site dedicated to the Chesapeake Bay watershed, available at: <http://www.landscape.org/chesapeake/> as the first regional section of Landscape.

Recommendations for Further Actions

The Locality Liaison program has proven most effective when the Locality Liaison can become actively involved in a specific project of concern to the locality. Furthermore, interest in natural heritage information often depends on timing such as whether a comprehensive plan is under review or a major development project is being considered. Thus, the Locality Liaison will strive to stay aware of upcoming locality events coordination with other Heritage regional and agency staff. The Liaison continues to identify when Coastal Zone localities comprehensive plans are due for review and will contact these localities at the appropriate time to offer assistance.

As the upgraded Natural Heritage Data Explorer becomes available in 2013, a program to train all users of the current website will be rolled out. The locality liaison will identify statewide locations for training to facilitate participation in the training by all current users and to encourage participation by localities that do not currently use the Natural Heritage Data Explorer. All training will include the ability for participants to attend by webinar to increase the options for all localities to attend one of the training sessions.

The Locality Liaison will continue to focus on contacting Localities that are not currently using Natural Heritage data. In some cases this may involve contacting departments other than planning, such as GIS or Environmental if they are separate entities. This may also involve an effort to assist Localities in developing ordinances or regulations necessitating the review of Natural Heritage information for certain projects, including renewable energy projects. Contacting PDCs may help in identifying the best way to involve some of the localities.

In addition, 36 Coastal Zone localities currently have access to NHDE or digital shapefile data. It is very important to provide follow-up assistance to these localities beyond the initial presentation. The Locality Liaison plans to work with these localities to determine how these data are being used and discuss local needs for further assistance. It is also important to keep in contact with the localities due to possible staffing changes.

The Locality Liaison web page and Landscape will continue to be updated as relevant information becomes available. The Liaison will work to further the promotion and use of the updated Wetland Restoration Catalog as an effective tool for planning and environmental review processes. The Locality Liaison along with the project review staff will continue to work to improve the overall project submittal and the environmental review process.

Appendix A

Letter for
Fort Belvoir (BRAC)

DCR Interoffice

MEMORANDUM

To: Robbie Rhur, DCR-DPRR

From: Alli Baird, DCR-DNH

Date: June 8, 2012

Subject: DEQ 12-103F, DOD, Dept of Army – 300 Area Water Upgrades, Fort Belvoir
Date Due: June 13, 2012

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Area T-17 Ravine Conservation Site is located partially within the project site. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Area T-17 Ravine Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resource of concern at this site is:

Stygobromus phreaticus Northern Virginia well amphipod G2G3/S1/SOC/NL

The Northern Virginia well amphipod (*Stygobromus phreaticus*, G2G3/S1/SOC/NL), is a distinctive species of subterranean amphipod that has a very limited range (Holsinger, 1991). Amphipods are tiny crustaceans more commonly known as freshwater shrimp, scuds, or sideswimmers. Their common names arise from their resemblance to shrimp and their habit of swimming or “scudding” along the substrate on their sides in an undulating motion (Pennak, 1978). Amphipods are common in freshwater ecosystems of Virginia; they also occur in brackish and marine waters along the coast. Unable to swim in open water, amphipods are confined to the substrate – the stones, wet leaves and aquatic vegetation of their freshwater habitats – where they feed on detritus (dead animal and plant matter).

The Northern Virginia well amphipod has been documented at only three sites, including historical collections obtained from wells in Alexandria (1921) and Vienna (1948) in northern Virginia (suburbs of Washington, D.C.). The exact locations of both collection sites are unknown, but they are presumed to have been destroyed by subsequent urbanization (Holsinger, 1991). The only recent collections (1996 and 2003) are from a single ravine seepage habitat on a military base in Fairfax County, Virginia (Chazal

and Hobson, 2003). Threats to the Northern Virginia well amphipod are pollution of the groundwater, disturbance of the groundwater recharge area (such as urbanization) and disturbance of aquatic habitats. Please note that this species is tracked as a species of concern by the United States Fish and Wildlife Service (USFWS); however, this designation does not have any official legal status.

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations. DCR also recommends avoiding impacts to the groundwater or recharge area supporting the Northern Virginia well amphipod and the development of a spill plan to address impacts of a spill or line breakage on nearby groundwater resources

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov). According to the information currently in our file, the Bald eagle (*Haliaeetus leucocephalus*) and Wood turtle (*Glyptemys insculpta*) have been documented in the project vicinity. Due to the legal status of the Bald eagle and Wood turtle, DCR recommends coordination with Virginia's regulatory authority for the management and protection of these species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

Thank you for the opportunity to comment on this project.

Cc: Amy Ewing, VDGIF
Kim Smith, USFWS

Literature Cited

Chazal, A.C. and C. S. Hobson. 2003. Surveys for the Northern Virginia Well Amphipod (*Stygobromus phreaticus*) at Fort Belvoir, Virginia. Natural Heritage Technical Report 03-11. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. Unpublished report submitted to USAG Fort Belvoir. 11 pp plus appendix.

Holsinger, John R. 1991. *Stygobromus phreaticus*. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. p185.

Pennak, R.W. 1978. Freshwater invertebrates of the southeastern United States, 2nd edition. John Wiley and sons, New York, NY. pp. 451-463.

Appendix B

Letter for NASA
Wallops Goddard Flight Facility

Douglas W. Domenech
Secretary of Natural Resources



David A. Johnson
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951

July 16, 2012

Steve Gibson
Norfolk District, Corps of Engineers
ATTN: CENAO-WR-R
803 Front Street
Norfolk, VA 23510-1096

Re: NAO-2011-0424, Wallops Flight Facility Unmanned Aerial Systems (UAS) Airstrip Final Submittal

Dear Mr. Gibson:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to information currently in our files, the project site is located within the North Wallops Island Conservation Site. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. North Wallops Island Conservation Site has been given a biodiversity significance ranking of B2 which represents a site of very high significance. The natural heritage resources of concern at this site are:

Maritime Dune Woodland	<i>Prunus serotina</i> / <i>Smilax rotundifolia</i> / <i>Schizachyrium littorale</i> Woodland	G1G2/S1/SOC/NL
Anomalous eupatorium	<i>Eupatorium anomalum</i>	G2G3/S1/NLNL

The Maritime Dune Woodland is a very rare community type known only from two sites in Virginia. This woodland comprises tall, temperate, deciduous maritime shrublands or scrub forests of the mid-Atlantic

coast. It generally occurs on the lee side of sand dunes along the coast and is subject to salt spray and winds. The substrate varies from pure sand directly adjacent to the ocean to loamy sands in more sheltered areas of the coast. Although placed within the shrubland class at one time, the physiognomy of this vegetation can be variable and ranges from open woodland to stunted forest to dense nearly impenetrable thicket (this association has been placed back in the forest class). Individual trees tend to be wind-pruned and multi-stemmed. The vegetation is dominated by *Prunus serotina*, *Amelanchier canadensis*, *Pinus taeda*, *Sassafras albidum*, *Photinia pyrifolia* (= *Aronia arbutifolia*), and *Diospyros virginiana* in varying proportions. *Morella cerifera* (= *Myrica cerifera*) and *Vaccinium corymbosum* may form a subcanopy, but if the community is particularly stunted, this species may contribute substantially to the canopy. Lianas are abundant in the canopy or over the ground layer, and species include *Smilax rotundifolia*, *Smilax glauca*, *Parthenocissus quinquefolia*, and *Toxicodendron radicans*. Herbs are generally scarce to lacking entirely, and when present are generally made up of tree and vine seedlings. (NatureServe, 2011)

The proposed project would directly impact this natural heritage resource. There are essentially eight occurrences of this community type with an aggregate coverage of only 84 ha (208 acres) in the world. Based on well-established ranking standards employed by NatureServe and the Natural Heritage network, the community therefore ranks as one of the rarest and least extensive (acreage-wise) natural communities in eastern North America. Moreover, there is little likelihood of additional occurrences since the environmental requirements (xeric high dunes well removed from salt spray) are rare everywhere within the known Mid-Atlantic range.

In Virginia, the only other occurrence of this community is found on the Chincoteague National Wildlife Refuge; data from the purported occurrence on Fisherman's Island has been re-analyzed and that occurrence has been more appropriately re-classified as a maritime forest. Therefore, the Wallops Island occurrence is also the southernmost known occurrence of the type and one of two occurrences in the state. The construction would remove approximately 0.93 ha (2.3 ac) of the maritime dune woodland. (NASA, June 2012)

Anomalous eupatorium is a tall, perennial, rhizomatous herb in the aster family and grows in interdunal swales, moist savannas (Weakley in prep.) The usually opposite-leaved stem branches toward the top and produces multiple, flat to convex-topped, white-flowered inflorescences in August – October. Anomalous eupatorium was documented during a site visit in October 2011 as part of DCR's re-inventory of the North Wallops Island Conservation Site, on the edges of a seldom-used road through old sand dunes. With the finding of this eupatorium in 2011 along the old access road on North Wallops Island, two occurrences are now documented in Virginia, the other in the Virginia Beach-False Cape area.

Anomalous eupatorium is known from Virginia, North Carolina, Georgia, Florida, and Alabama. A species of hybrid origin, what is known as *Eupatorium anomalum* currently, may in fact need to be split into two entities, one with a *E. semiserratum* x *E. mohri* lineage (Florida, Alabama) and the other with a *E. serotinum* x *E. mohri* lineage. The recent DNA sequencing of the Wallops Island collections by Edward Schilling of the University of Tennessee confirmed that this Wallops Island population is similar to the Virginia Beach population and North Carolina material in being derived from *E. mohri* x *E. serotinum* (E. Schilling pers. com 2011). The Wallops Island plants may therefore be an even rarer entity than it is currently ranked. The population at Wallops is highly threatened by a combination of the proposed limits of disturbance for the airstrip project, that will impact two thirds of the population area, and by the succession / re-vegetation occurring along the seldom-used road.

DCR has reviewed Chapter 4: Mitigation and Monitoring of the *North Wallops Island Unmanned Aerial Systems Airstrip, Environmental Assessment* and the proposed Wallops Flight Facility Rare Species and Community Action Plan for Northern Wallops Island (Appendix G) as minimization and mitigation

measures for impacts to documented natural heritage resources (Maritime Dune Woodland Community and *Eupatorium anomalum*) from the proposed Unmanned Aerial Systems Airstrip project. The action plan includes the establishment of research study areas (Mitchell, June 13, 2012, Enclosure 1) and inclusion of these areas into the master planning process for the Wallops Flight Facility. It also includes the development and implementation of an invasive species management plan (Appendix F) as well as monitoring of the remaining *E. anomalum* population dependent upon funding. DCR supports the action plan and invasive species management plan (Appendices F and G of the *Final North Wallops Island Unmanned Aerial Systems Airstrip Environmental Assessment*, dated June 2012).

Furthermore, Peregrine falcon (*Falco peregrinus*, G4/S1BS2N/NL/LT), Northern Harrier (*Circus cyaneus*, G5/S1S2B,S3N/NL/NL), Piping plover (*Charadrius melodus*, G3/S2B,S1N/LT/LT), Wilson's plover (*Charadrius wilsonia*, G5/S1B/NL/LE), and Little blue heron (*Egretta caerulea*, G5/S2B,S3N/NL/NL) have been documented within the project area and the project vicinity. DCR supports the continued annual monitoring of the peregrine falcon use of the hacking tower, the bald eagle nest at the east end of the proposed airstrip's clear zone, annual shorebird monitoring and the monitoring of the effects of the aircraft on plovers and other shorebirds in conjunction with an adaptive management approach as described as described on p 3-39-40 of the *North Wallops Island Unmanned Aerial Systems Airstrip, Environmental Assessment, Chapter 3: Affected Environment and Environmental Consequences, 3.5.2.1.3 Special-Status Species Monitoring* and in *Chapter 4: Mitigation and Monitoring, Biological Resources*.

Due to the legal status of the Peregrine falcon and Wilson's plover, DCR recommends coordination with Virginia's regulatory authority for the management and protection of these species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570). Due to the legal status of the Piping plover, DCR also recommends continued coordination with USFWS and VDGIF to ensure compliance with protected species legislation.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov). This project is located within 2 miles of a documented occurrence of a state listed animal. Therefore, DCR recommends coordination with VDGIF, Virginia's regulatory authority for the management and protection of this or these species to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

Should you have any questions or concerns, feel free to contact me at 804-692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

Alli Baird

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

Cc : Amy Ewing, VDGIF
Kim Smith, USFWS
Sherri Kattan, DEQ

Literature Cited:

Joel Mitchell, June 13, 2012. Personal communication. NASA, Natural Resources Program Manager/Hazardous Waste and Air Programs.

NASA, *North Wallops Island Unmanned Aerial Systems Airstrip Environmental Assessment*, NASA, Goddard Space Flight Center, Wallops Flight Facility, Wallops Island, VA, June 2012.

NatureServe. 2011. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: January 26, 2012).

Weakley, A. In prep. Flora of the southern and mid-Atlantic states. Working draft of 15 May 2011. University of North Carolina Herbarium, North Carolina Botanical Garden, University of North Carolina at Chapel Hill, NC.

Appendix C

Letter for
Presquile NWR
Comprehensive Conservation Plans



COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951

May 25, 2012

Meghan Carfioli
Eastern Virginia Rivers NWR Complex
1116 Kimages Road
Charles City, VA 23030

Re: Presquile NWR Draft Comprehensive Conservation Plan and Environmental Assessment

Dear Ms. Carfioli:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, this site is located within the Curles Neck Conservation Site. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Curles Neck Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resources of concern at this site are:

<i>Aeschynomene virginica</i>	Sensitive joint-vetch	G2/S2/LT/LT
<i>Haliaeetus leucocephalus</i>	Bald eagle	G5/S2S3B,S3N/NL/LT

Sensitive joint-vetch is a bristly stemmed annual legume growing to 2 meters in height. The characteristic pinnately divided leaves are gland-dotted and may fold slightly if touched. The pea-shaped flowers are yellow streaked with orange-red. This legume occurs in freshwater to brackish wetland habitats, primarily marshes, in the intertidal zone of our larger coastal rivers. This habitat type often supports a high diversity of both rare and common plant species. This annual herbaceous plant is

classified as federally listed by the United States Fish and Wildlife Service (USFWS) and stated listed by the Virginia Department of Agriculture and Consumer Services (VDACS).

To thrive, sensitive joint-vetch may require minimal competition from other plants. For this reason, plants are frequently found on accreting point bars and levees that have not yet been colonized by perennial species. Sensitive joint-vetch populations however, may also be found within marsh interiors. Researchers believe that these plants may be able to thrive there because of harsh soil and nutrient conditions that inhibit growth of potential competitors. An additional theory for the sensitive joint-vetch occurring at those locations is that grazing herbivores, such as muskrat (*Ondatra zebethicus*), eat large areas of vegetation ("muskrat eat-outs") leaving behind exposed soils that are more easily colonized by annuals.

Populations face many potential on-site and off-site threats, including activities that alter natural river currents and sediment cycling and, thereby, prevent the development of accreting point-bar habitats for the species and/or cause erosion of that habitat. Other potential threats include activities which result in increased salinity levels, water pollution, displacement by aggressive species, and activities which result in excessive sediment loading which could inhibit germination of seeds or smother seedlings (USFWS, 1995). Sensitive joint-vetch is currently known from about 30 locations in Virginia's coastal plain, 10 of which are historical occurrences.

Surveys for sensitive joint-vetch should be conducted from August 15 to October 15. At this time the plant is in flower or fruit and has attained some stature making it more visible during the surveys typically conducted from a boat.

The Bald eagle breeds from Alaska eastward through Canada and the Great Lakes region, along coastal areas off the Pacific and Atlantic Oceans, and the Gulf of Mexico, and in pockets throughout the western United States (NatureServe, 2009). In Virginia, it primarily breeds along the large Atlantic slope rivers (James, Rappahannock, Potomac, etc) with a few records at inland sites near large reservoirs (Byrd, 1991). Bald eagle nest sites are often found in the midst of large wooded areas near marshes or other bodies of water (Byrd, 1991). Bald eagles feed on fish, waterfowl, seabirds (Campbell et. al., 1990), various mammals and carrion (Terres, 1980). Please note that this species is currently classified as threatened by the Virginia Department of Game and Inland Fisheries (VDGIF).

Threats to this species include human disturbance of nest sites (Byrd, 1991), habitat loss, biocide contamination, decreasing food supply and illegal shooting (Herkert, 1992).

In addition, this site is also located within the Turkey Island Cutoff Conservation Site. The Turkey Island Cutoff Conservation Site has been given a biodiversity significance ranking of B5, which represents a site of general significance. The natural heritage resource of concern at this site is the Bald eagle.

Moreover, the Atlantic sturgeon (*Acipenser oxyrinchus*, G3/S2/LE/NL) has been documented in the James River within the project vicinity. Atlantic sturgeon is a large fish that reaches a maximum length of about 4.3 meters and may live for several decades. The adults migrate between fresh water spawning areas and salt water non-spawning areas. They feed primarily on benthic invertebrates and small fishes as available.

Stocks on the Atlantic slope have been severely reduced by overfishing (mainly late 1800s and early 1900s), pollution, sedimentation, and blockage of access to spawning areas by dams (Gilbert 1989, Burkhead and Jenkins 1991, Marine and Coastal Species Information System 1996). In Chesapeake Bay and elsewhere in the range, hypoxic events have increased and may degrade nursery habitat for Atlantic sturgeon (Secor and Gunderson 1997). Habitat loss due to dam construction and water pollution are

thought to be major factors impeding full recovery of populations (Smith 1985, cited by Johnson et al. 1997; Gilbert 1989). A late maturation age and use of estuaries, coastal bays, and upstream areas of rivers for spawning and juvenile development make stocks vulnerable to habitat alterations in many areas (NatureServe 2012). Please note that this species is currently classified as a species of concern by the United States Fish and Wildlife Service (USFWS) however, this designation has no official legal status.

DCR supports the protection and enhancement of the natural heritage resources and associated habitat documented at the Presquile NWR, as well as the active control of invasive species within the refuge. However, some of the restoration and/or enhancement activities described in the comprehensive conservation plan may potentially impact natural heritage resources. Therefore, DCR recommends an updated survey for rare, threatened and endangered species and natural communities be conducted prior to the development of management plans for these resources.. With the survey results, DCR can offer specific protection recommendations for documented resources.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact J. Christopher Ludwig, Natural Heritage Inventory Manager, at chris.ludwig@dcr.virginia.gov or 804-371-6206 to discuss arrangements for field work. A list of other individuals who are qualified to conduct inventories may be obtained from the USFWS.

Due to the legal status of the Bald eagle, DCR recommends coordination with Virginia's regulatory authority for the management and protection of this species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570). Due to the legal status of the Atlantic sturgeon, DCR also recommends coordination with USFWS to ensure compliance with protected species legislation.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov).

Should you have any questions or concerns, feel free to contact me at 804-692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

Alli Baird

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

Cc: Amy Ewing, VDGIF
Kim Smith, USFWS

Literature Cited

- Burkhead, N. M., and R. E. Jenkins. 1991. Fishes. Pages 321-409 in K. Terwilliger (coordinator). Virginia's Endangered Species: Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.
- Byrd, M.A. 1991. Bald eagle. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. Pp. 499-501.
- Campbell, R.W., N.K. Dawe, I. McTaggart-Cowan, J.M. Cooper, G.W. Kaiser, and M.C.E. McNall. 1990. The Birds of British Columbia. Vol. 1. Nonpasserines: Introduction and loons through waterfowl. Royal British Columbia Museum, Victoria, British Columbia, Canada.
- Gilbert, C. R. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic Bight) Atlantic and shortnose sturgeons. U.S. Fish and Wildlife Service Biological Report. 82(11.22). U.S Army Corps of Engineers TR EL-82-4. 28 pp.
- Herkert, J. R., editor. 1992. Endangered and threatened species of Illinois: status and distribution. Vol. 2: Animals. Illinois Endangered Species Protection Board. iv + 142 pp.
- Johnson, J. H., D. S. Dropkin, B. E. Warkentine, J. W. Rachlin, and W. D. Andrews. 1997. Food habits of Atlantic sturgeon off the central New Jersey coast. Transactions of the American Fisheries Society 126(1):166-170.
- Marine and Coastal Species Information System. 1996. October 1-last update. Fish and Wildlife Information Exchange-VA Tech. Online. Available: <http://www.fw.vt.edu/fishes/macsis.html>.
- NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 14, 2012).
- NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: June 24, 2010)
- Secor, D. H., and T. E. Gunderson. 1997. Effects of hypoxia and temperature on survival, growth, and respiration of juvenile Atlantic sturgeon, *Acipenser oxyrinchus*. Fisheries Bulletin 96:603-613.
- Terres, J.K. 1980. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York.
- The Nature Conservancy and The Network of Natural Heritage Programs and Conservation Data Centers. 1999. Natural Heritage Conservation Databases. Accessed through the Biosource web site project. The Nature Conservancy, Arlington, VA. (07/1499).

United States Fish and Wildlife Service. 1995. Sensitive joint-vetch (*Aeschynomene virginica*) Recovery Plan. Hadley, Massachusetts. 55 pp.

Appendix D

Letter for Route 5
Capital to Capital Trail

Douglas W. Domenech
Secretary of Natural Resources



David A. Johnson
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951

March 5, 2012

Robert Blackman
VDOT-Richmond Environmental Section
1401 East Broad Street
Richmond, VA 23219-2000

Re: Route 5 Capital to Capital Trail – Varina Phase

Dear Mr. Blackman:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Four Mile Creek at Route 5 Stream Conservation Unit is located downstream from the project site. Stream Conservation Units (SCUs) identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Four Mile Creek at Route 5 SCU has been given a biodiversity ranking of B3, which represents a site of high significance. The natural heritage resource associated with this site is:

Aquatic Natural Community

G2/S2/SOC/NL

The documented Aquatic Natural Community is based on Virginia Commonwealth University's **INSTAR** (*Interactive Stream Assessment Resource*) database which includes over 2,000 aquatic (stream and river) collections statewide for fish and macroinvertebrate. These data represent fish and macroinvertebrate assemblages, instream habitat, and stream health assessments. The associated Aquatic Natural Community is significant on multiple levels. First, this stream is a grade B, as per the VCU-Center for Environmental Sciences (CES), indicating its relative regional significance, considering its aquatic community composition and the present-day conditions of other streams in the region. This stream reach also holds as a "Healthy" stream designation as per the INSTAR Virtual Stream Assessment (VSS) score.

This score assesses the similarity of this stream to ideal stream conditions of biology and habitat for this region. Lastly, this stream contributes to high Biological Integrity at the watershed level (6th order) based on number of native/non-native, pollution-tolerant/intolerant and rare, threatened or endangered fish and macroinvertebrate species present. Threats to the significant Aquatic Natural Community and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal and introduction of non-native species.

In addition, Laura's clubtail (*Stylurus laurae*, G4/S2/NL/NL) has been historically documented downstream of the project area in the James River. Laura's clubtail, a state rare dragonfly, ranges from Ohio south to Florida with westward records to Texas (Kondratieff, 2000). In Virginia, there are records across the Piedmont and west to the Ridge and Valley region. Its habitat consists of moderated gradient streams with many shallow riffles and runs (NatureServe, 2009).

Though somewhat tolerant of decreased water quality, threats include activities which alter the water flow or substrate such as: impoundments, channelization, dredging, siltation, agricultural non-point pollution, and municipal and industrial pollution. In addition, timber harvest may increase siltation and cause a decrease in dissolved oxygen as canopy cover is removed and water temperature rises (NatureServe, 2009).

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The VDGIF maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Shirl Dressler at (804) 367-6913. According to information currently in our files, the following state-listed animals have been documented in the project vicinity: Bald eagle and Peregrine falcon. Due to the legal status of these species, DCR recommends coordination with Virginia's regulatory authority, the VDGIF, for the management and protection of these species to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

Should you have any questions or concerns, feel free to contact me at 804-692-0984. Thank you for the opportunity to comment on this project.

Sincerely,



Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

Cc: Ernie Aschenbach, VDGIF
Kim Smith, USFWS

Literature Cited

Kondratieff, Boris C. (coordinator). 2000. Dragonflies and Damselflies (Odonata) of the United States. Jamestown, ND: Northern Prairie Wildlife Research Center Online.
<http://www.npwrc.usgs.gov/resource/distr/insects/dfly/index.htm> (Version 12DEC2003). Accessed 25Mar2010.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: April 5, March 25, 2010 and June 24, 2010)

Appendix E

Letter for National Park Service
Management Plan



COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951

May 18, 2012

Edward W. Clark, III
Manassas National Battlefield Park
12521 Lee Highway
Manassas, VA 20109-2005

Re: Manassas National Battlefield White-tailed Deer Management Plan

Dear Mr. Clark:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the following natural heritage resources are documented within the Manassas National Battlefield Park boundary:

Blue-hearts	<i>Buchnera Americana</i>	G5/S1S2/NL/NL
Purple milkweed	<i>Asclepias purpurascens</i>	G5/S2/NL/NL
Marsh hedgenettle	<i>Stachys arenicola</i>	G5T4/S1/NL/NL
Appalachian quillwort	<i>Isoetes appalachiana</i>	G4/S2/NL/NL
Buffalo clover	<i>Trifolium reflexum</i>	G5/S1/NL/NL
Northern Hardpan Basic Oak – Hickory forest		G3/S3/NL/NL
Piedmont Upland Depression Swamp (Pin Oak – Swamp White Oak Type)		G2/S1/SOC/NL
Aquatic Natural Community		G2G3/S2S3/SOC/NL

In addition, the Brook floater (*Alasmidonta varicose*, G3/S1/NL/LE) has been historically documented within the project area.

DCR supports efforts by the National Park Service to reduce White-tailed deer herds to within the carrying capacity of the Manassas National Battlefield Park to preserve and protect the natural heritage resourced within the park boundaries. Due to the legal status of the Brook floater, DCR recommends coordination with Virginia's regulatory authority for the management and protection of this species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

In addition, the Elklick Woodlands Natural Area Preserve has also been documented in the project vicinity. However, due to the scope of the project DCR does anticipate any negative impacts to this preserve and associated natural heritage resources.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov).

Should you have any questions or concerns, feel free to contact me at 804-692-0984. Thank you for the opportunity to comment on this project.

Sincerely,



Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

Cc: Ernie Aschenbach, VDGIF
Kim Smith, USFWS

Appendix F

Natural Heritage
Data Explorer Update

Reference Layers

- Reference layers
 - NHD High Resolution Streams
 - VA 24k Grid
 - VA Physiographic Provinces
 - VA Counties
- Counties
- USGS Placenames
- VDOT Roads
- Trails
- Scenic Rivers
- Managed Conservation Lands

Boundaries

- Subwatershed Boundaries
- 8 Digit Watershed Boundaries
- Planning Districts

VCLNA

- Ecological Cores
- Agricultural Model
- Cultural Asset Model
- Forest Economics Model
- Recreation Model
- Water Quality Integrity Model
- Vulnerability Model

Karst Research

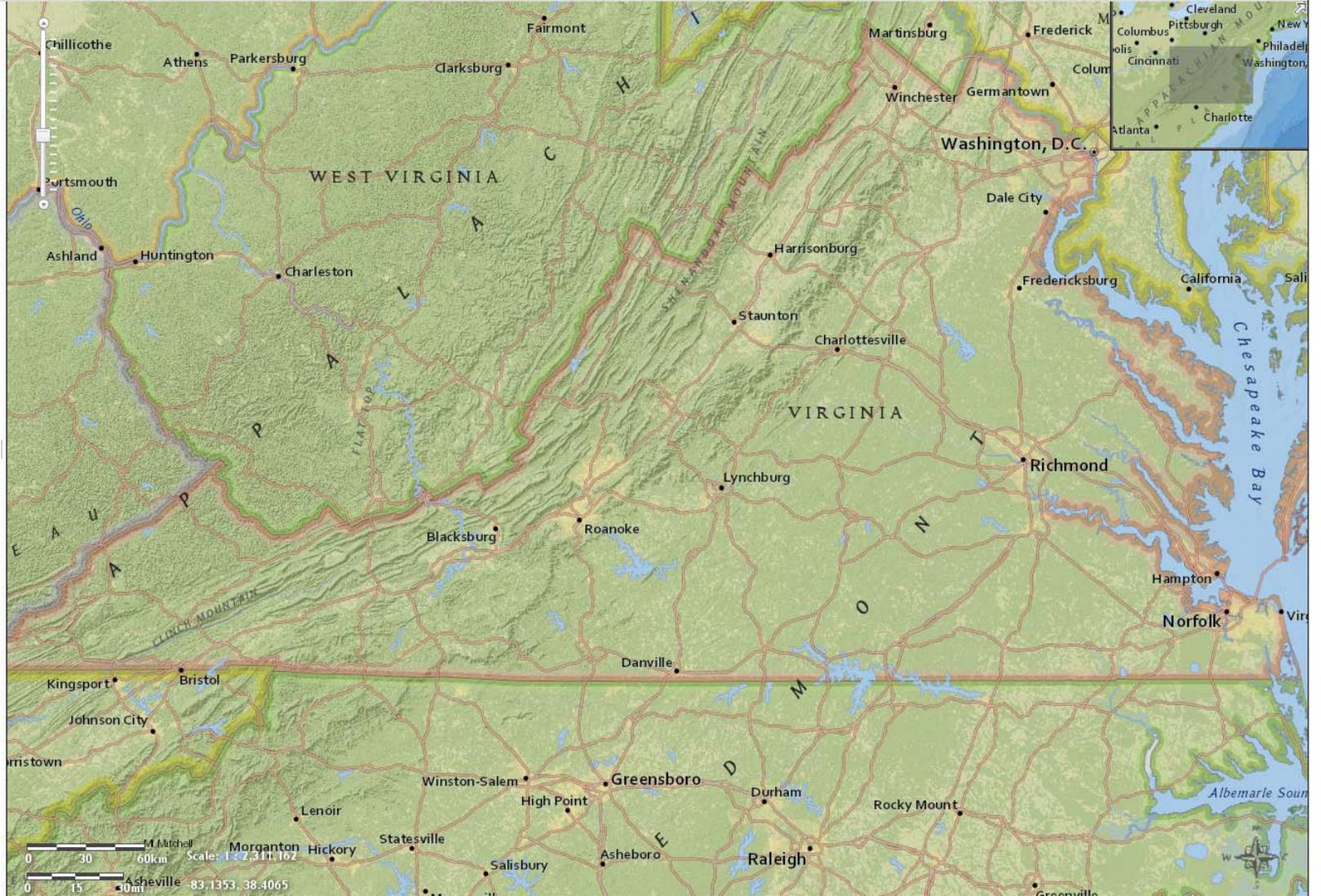
- Dye Inputs

Predictive Models

- Amaranthus pumilus*
- Cardamine micranthera*
- Rhus michauxii*
- Karst antrolina lira
- Karst Diabase
- Karst Bedrock

Basemap

Basemap: National Geographic



Appendix G

Accomack County
Comprehensive Plan
Information Provided

Accomack County Natural Heritage Resources

Natural heritage resources as defined by the Virginia Department of Conservation and Recreation – Division of Natural Heritage (DCR) are the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations such as caves and karst features. Accomack County is currently home to 105 distinct types of natural heritage resources with 241 total occurrences throughout the county (Table I - Natural Heritage Resources). In addition, DCR has identified 60 terrestrial and aquatic conservation sites as areas necessary for their survival and there are 4 Natural Area Preserves within its boundaries. (Table II: Conservation Sites and Table III - Natural Area Preserves)

DCR identifies and protects natural heritage resources statewide and maintains a comprehensive database of all documented occurrences of natural heritage resources in Virginia. DCR has developed conservation sites that contain known populations of natural heritage resources and include adjacent or surrounding habitat vital for their protection. Conservation sites do not represent protected lands. They are recommended for protection and stewardship because of the natural heritage resources and habitat they support, but are not currently under any official protection designation. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element’s conservation. Conservation sites can be used to screen development projects for potential impacts to natural heritage resources, aid local and regional planning, identify targets for acquisitions and easements and guide priorities for restoration activities.

An example of a conservation site in Accomack County is Assawoman Creek Fen Conservation Site. In addition to multiple rare species and habitat types found here, the site/ecosystem are critically important because of the geographic location. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Assawoman Creek Fen Conservation Site has been given a biodiversity significance ranking of B2, which represents a site of very high significance. The natural heritage resources associated with this conservation site are:

	Sea-level Fen	G1/S1/SOC/NL
<i>Erigeron vernus</i>	White-top fleabane	G5/S2/NL/NL
<i>Eriocaulon decangulare</i>	Ten-angle pipewort	G5/S2/NL/NL
<i>Rhynchospora alba</i>	White beakrush	G5/S2/NL/NL
<i>Sclerolepis uniflora</i>	One-flower sclerolepis	G4/S1/NL/NL
<i>Utricularia junca</i>	Southern bladderwort	G5/S2/NL/NL



Sea-level Fen

Photo by DCR-DNH, Dot Field ©2012

Maritime seepage wetlands known as Sea-Level Fens are confined to a few sites with an unusual combination of environmental conditions for this region. They occur very locally along the Atlantic Coast from Virginia to Massachusetts, and possibly New Hampshire. Only four occurrences are known in Virginia, all of them on the Eastern Shore (Accomack County). Habitats are situated just above normal highest tide levels, at the bases of slopes where abundant groundwater discharges along the upper edges of estuarine bays. The constant influx of fresh groundwater dilutes the impact of occasional salinity inputs from storm tides and spray. The hydrology of these sites is best characterized as saturated, although shallow standing water and small, muck-filled pools are locally present at all sites. Soils are organic and nutrient-poor.

The vegetation exhibits characteristics of both inland seepage bogs and tidal oligohaline marshes. Stands are generally a physiognomic mosaic of open woodland, scrub, and herbaceous patches. Woody species include red maple (*Acer rubrum*), blackgum (*Nyssa sylvatica*), sweetbay (*Magnolia virginiana*), and southern bayberry (*Myrica cerifera* var. *cerifera*). Characteristic herbs include twig rush (*Cladium mariscoides*), beaked spikerush (*Eleocharis rostellata*), white beakrush (*Rhynchospora alba*), few-flowered beakrush (*Rhynchospora oligantha*), spoon-leaved sundew (*Drosera intermedia*), ten-angled pipewort (*Eriocaulon decangulare* var. *decangulare*), coinleaf (*Centella erecta*), brown-fruited rush (*Juncus pelocarpus*), and bladderworts (*Utricularia* spp.). These communities are extremely rare and local throughout their known range along the Atlantic Coast from New Jersey to Virginia. Many state-rare plants are associated with the Virginia occurrences. Chronic sea-level rise, with associated intrusions of tidal flooding and salinity, comprises a serious threat to the long-term viability of all sea-level fens. (Fleming, et al, 2012)



White-top fleabane
Photo by DCR-DNH staff ©1999

White-top fleabane, a state rare perennial herb, is a coastal plant found within five miles of the Atlantic Ocean (Ludwig, 1996). It inhabits wet savannas, seepages, interdunal swales, (Weakley, in prep.) bogs, and ditches (Radford et. al., 1968). It has also been documented in such disturbed areas as powerline rights-of-way (TNC, 1996). It has a daisy-like flower that blooms in spring, and it grows approximately one foot tall (Ludwig, 1996). White-top fleabane is currently known from eight locations in Virginia's coastal plain, as well as multiple historic locations. Virginia is the northern limit of this species' range.



Ten-angle pipewort
Photo by DCR-DNH, D. Field ©2003

Ten-angle pipewort, a state rare plant, inhabits bogs, savannas and low pinelands and blooms from June through October (Radford et. al., 1968). This plant is currently known from 14 locations throughout Virginia, and known historically at 3 locations.



White Beakrush

Photo by DCR-DNH, I. Wilson ©2003

White beakrush is an herbaceous perennial that fruits in the summer-fall. It lives in acidic, sphagnum, boggy, open sites and poor fens, (Flora, 2002), and peaty situations in the Coastal Plain, such as low pocosins in peat domes or large Carolina bays, and floating peat mats in limesink (doline) ponds and bay lakes, possibly also in seepage bogs with abundant Sphagnum, generally occurring in the most open, harshest, and peatiest areas. (Weakley, in prep., p. 253)

One-flower sclerolepis can be found in shallow water (later sometimes stranded on shore by dropping water levels) of clay-based Carolina bays, natural lake shores, blackwater stream shores and swamps, in seepage wetlands including sea-level fens. (Weakley, in prep. P. 950.)



Southern bladderwort

Photo by DCR-DNH staff ©1999

Southern bladderwort, a state rare plant, inhabits bogs, ditches and moist depressions and blooms from July to September (Radford et. al., 1968, p.969). In Virginia, this plant is currently known from four locations in the coastal plain.

Natural Area Preserves:

Accomack County has four Natural Area Preserves (NAPs) that help protect rare maritime communities and provide habitat for other natural heritage resources. The Virginia Natural Area Preserves System was established in the late 1980's to protect some of the most significant natural areas in the Commonwealth. A site becomes a component of the preserve system once it is dedicated as a natural area preserve by the Director of the Department of Conservation & Recreation. Natural area dedication works in much the same way as a conservation easement by placing legally binding restrictions on future activities on a property. The Natural Area Preserve System includes examples of some of the rarest natural communities and rare species habitats in Virginia.

While all of the Accomack County natural area preserves provide habitat for migrating birds, Parkers Marsh has been also designated an [Audubon Important Bird Area](#) (IBA) as part of the Delmarva Bayside Marshes IBA. Important Bird Areas, or IBAs, are sites that provide essential habitat for one or more species of bird, providing sites for breeding, wintering, and/or migrating birds. They can range in size from a few to thousands of acres, but usually IBAs are discrete sites that stand out from the surrounding landscape. IBAs may or may not be protected and may include private lands, public lands or a combination of both. Marks and Jacks Island is also part of the Delmarva Bayside Marshes IBA. Parramore Island is in the Barrier Island/Lagoon System IBA and Mutton Hunk Fen NAP borders this IBA.



Marsh, shrub and forested habitats of Parkers Marsh and Mark's and Jack's Islands
Photo by DNH staff ©2005

Parkers Marsh and Mark's and Jack's Islands

Parkers Marsh NAP and Mark's and Jack's Islands NAP support Chesapeake Bay beach habitat, low marsh, high marsh, shrub and forest vegetation. The wetland communities provide habitat for a variety of plant and animal species, including migrating waterfowl, shorebirds and songbirds. Both preserves have extensive salt marshes that provide ideal habitat for marsh nesting birds. Maritime shrub communities supporting species such as marsh elder, southern wax myrtle and black cherry are found on old dune ridges in the marshes of Mark's and Jack's and Parkers Marsh. Both Parkers Marsh and Mark's and Jack's Islands support the Northeastern beach tiger beetle on their sandy beaches. The beach strand at Parkers Marsh supports one of the largest and most viable populations of the federally threatened beetle.



Parramore Island
Photo by DNH – Field 2003

Parramore Island

More than seven and a half miles long, Parramore Island, the state's largest natural area preserve, is one of 14 uninhabited Atlantic barrier islands that are part of The Nature Conservancy's Virginia Coast Reserve. The island features a high-energy beach and dune system, a globally rare maritime scrub community, and expansive salt marshes.



Mutton Hunk Fen – Sea-level Fen
Photo by DNH – I Wilson©2002

Mutton Hunk Fen

Mutton Hunk Fen on Gargathy Bay protects a globally rare sea-level fen community, one of only four in Virginia. Sea-level fens are open, freshwater wetlands located between uplands and wide, oceanside tidal marshes. The freshwater wetland vegetation is sustained by springs at the upland edge that provide large volumes of fresh groundwater. The vegetation, including five state-rare plant species, consists of an interesting combination of acid-tolerant bog plants and tidal freshwater wetland plants capable of surviving in low nutrient areas.

Potential Threats to Natural Heritage Resources:

The single greatest threat to Accomack and its natural heritage resources is the ongoing conversion of habitat to residential and commercial development. The resulting increase in nutrient run-off and infiltration into groundwater can affect water quality, in turn affecting food sources for natural heritage resources, such as the Northeastern tiger beetle.

There is the potential for habitat disruption from salt-water intrusion caused by over-withdrawal from sole-source aquifers for surrounding developments. Sea-level rise will also alter habitat through salt-water inundation of marshes, fens and barrier islands. In addition, alteration of the local hydrology by land disturbance can change or eliminate habitat such as the sea-level fens that require consistent fresh water.

Fragmentation of forests and the introduction of invasives, both flora and fauna, can have a direct effect on the survival of many native plants. Finally, beach stabilization activities on northern islands can disrupt habitat by altering the sand flow dynamics on the barrier islands.

Literature Cited:

Fleming, G.P., K.D. Patterson, K. Taverna, and P.P. Coulling. 2012. The natural communities of Virginia: classification of ecological community groups. Second approximation. Version 2.5. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA.

Flora of North America Editorial Committee. 2002. Flora of North America North of Mexico, Volume 23, Magnoliophyta: Commelinidae (in part): Cyperaceae. Oxford University Press: New York and Oxford.

Ludwig, J. Christopher. 1996. Personal communication. Virginia Department of Conservation and Recreation, Division of Natural Heritage.

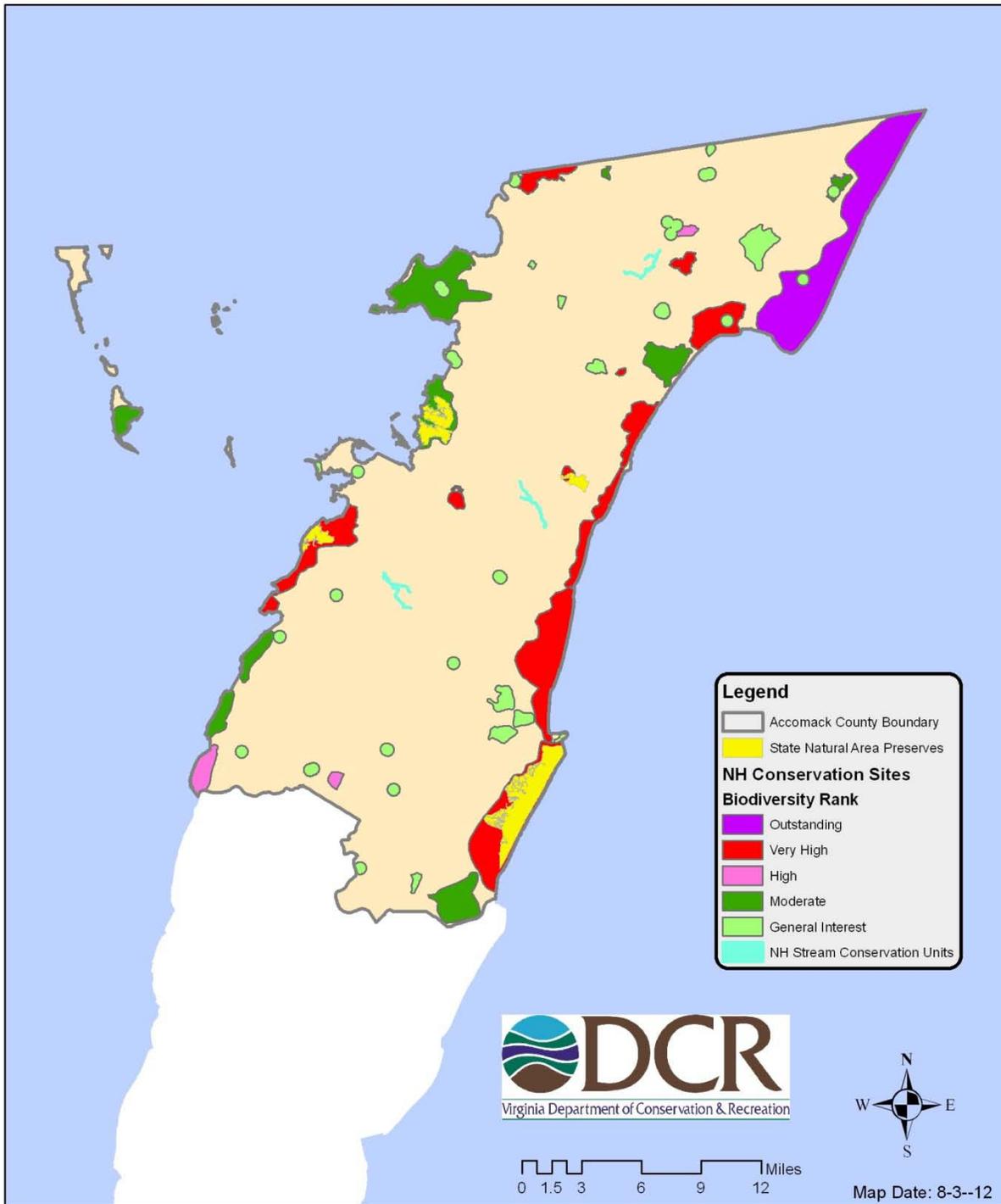
Radford, A.E., H.A. Ahles, C.R. Bell. 1968. Manual of the Vascular Flora of the Carolinas. University of North Carolina Press, Chapel Hill. p. 179-181, 266, 969.

The Nature Conservancy. 1996. Biological and Conservation Data System. Arlington, Virginia, USA.

Weakley, A.S. In prep. Flora of the Carolina's and Virginia. The Nature Conservancy, Southeastern Regional Office. p. 5-28.

Weakley, Alan S. In prep. Flora of the Southern and Mid-Atlantic States, working draft of 15 May, 2011. University of North Carolina Herbarium, North Carolina Botanical Garden, University of North Carolina at Chapel Hill, NC. pp. 253, 950. (Accessed online 6/22/2012)

Accomack County Natural Heritage Conservation Sites



Accomack County

Natural Heritage Resources - Table I

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Terrestrial Natural Community	(<i>Myrica pensylvanica</i>) / <i>Schizachyrium littorale</i> Shrub Herbaceous Vegetation	Xeric Backdune Grassland	1996-10-01	G2	SOC	S2			ASSATEAGUE ISLAND
Terrestrial Natural Community	(<i>Myrica pensylvanica</i>) / <i>Schizachyrium littorale</i> Shrub Herbaceous Vegetation	Xeric Backdune Grassland	2010-09-20	G2	SOC	S2			NORTH WALLOPS ISLAND
Terrestrial Natural Community	<i>Alnus serrulata</i> - <i>Magnolia virginiana</i> / <i>Andropogon</i> <i>glomeratus</i> - <i>Eupatorium pilosum</i> - <i>Rhynchospora</i> <i>gracilentata</i> - <i>Xyris torta</i> Shrubland	Coastal Plain / Outer Piedmont Seepage Bog	1995-07-11	G2	SOC	S1			WALLOPS ISLAND SEEPS
Vascular Plant	<i>Amaranthus pumilus</i>	Seabeach Amaranth	2008-08	G2		S1	LT	LT	ASSATEAGUE ISLAND
Vascular Plant	<i>Amaranthus pumilus</i>	Seabeach Amaranth	1967-07-05	G2		S1	LT	LT	
Vascular Plant	<i>Amaranthus pumilus</i>	Seabeach Amaranth	2004	G2		S1	LT	LT	
Vertebrate Animal	<i>Ammodramus</i> <i>caudacutus</i>	Saltmarsh Sharp-tailed Sparrow	1989-05-26	G4				S2B,S3N	FREESCHOOL MARSH
Vertebrate Animal	<i>Ammodramus</i> <i>caudacutus</i>	Saltmarsh Sharp-tailed Sparrow	1990-07-31	G4				S2B,S3N	FREESCHOOL MARSH
Vertebrate Animal	<i>Ammodramus</i> <i>caudacutus</i>	Saltmarsh Sharp-tailed Sparrow	1990-07-30	G4				S2B,S3N	PARKERS MARSH/ISLAND
Vertebrate Animal	<i>Ammodramus</i> <i>caudacutus</i>	Saltmarsh Sharp-tailed Sparrow	1995-07-07	G4				S2B,S3N	WALLOPS ISLAND CAUSEWAY MARSHEs
Vascular Plant	<i>Amphicarpum</i> <i>amphicarpon</i>	Blue maiden-cane	1996-10-02	G4		S1			NEW CHURCH POWERLINE WETLAND
Vertebrate Animal	<i>Ardea alba</i>	Great Egret	2004-06-23	G5				S2S3B,S3N	CHIMNEY POLE MARSH
Vertebrate Animal	<i>Ardea alba</i>	Great Egret	1987-07-07	G5				S2S3B,S3N	
Vertebrate Animal	<i>Ardea alba</i>	Great Egret	1987-07-07	G5				S2S3B,S3N	
Terrestrial Natural Community	<i>Bacopa monnieri</i> - <i>Eleocharis albida</i> Herbaceous Vegetation	Interdune Pond (Coastal Water- Hyssop - White Spikerush Oligohaline Type)	1996-09-04	G1Q	SOC	S1			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Bacopa monnieri</i> - <i>Eleocharis albida</i> Herbaceous Vegetation	Interdune Pond (Coastal Water- Hyssop - White Spikerush Oligohaline Type)	1996-09-04	G1Q	SOC	S1			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Bacopa monnieri</i> - <i>Eleocharis albida</i> Herbaceous Vegetation	Interdune Pond (Coastal Water- Hyssop - White Spikerush Oligohaline Type)	1996-10-01	G1Q	SOC	S1			ASSATEAGUE ISLAND

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Terrestrial Natural Community	Bacopa monnieri - Eleocharis albid Herbageous Vegetation	Interdune Pond (Coastal Water-Hyssop - White Spikerush Oligohaline Type)	1996-09-04	G1Q	SOC	S1			ASSATEAGUE ISLAND
Vascular Plant	Baptisia albescens	Prairie False-indigo	1997-05-28	G4		S1			
Animal Assemblage	Bird Nesting Colony		2009-06-09	G5		SNR			ASSAWOMAN ISLAND
Animal Assemblage	Bird Nesting Colony		2009-06-09	G5		SNR			CEDAR ISLAND
Animal Assemblage	Bird Nesting Colony		2004-06-23	G5		SNR			CHIMNEY POLE MARSH
Animal Assemblage	Bird Nesting Colony		2004-06-23	G5		SNR			CHIMNEY POLE MARSH
Animal Assemblage	Bird Nesting Colony		2008-06-09	G5		SNR			CUNJER CHANNEL MARSH TUMPS HABITAT ZONE
Animal Assemblage	Bird Nesting Colony		1991-06-11	G5		SNR			CURLEW BAY MARSH HABITAT ZONE
Animal Assemblage	Bird Nesting Colony		2007-06-09	G5		SNR			DAWSON SHOALS
Animal Assemblage	Bird Nesting Colony		1991-	G5		SNR			HUMMOCK COVE MARSH HABITAT ZONE
Animal Assemblage	Bird Nesting Colony		1992-06-23	G5		SNR			METOMPKIN ISLAND
Animal Assemblage	Bird Nesting Colony		2009-06-09	G5		SNR			METOMPKIN ISLAND
Animal Assemblage	Bird Nesting Colony		1991-06-16	G5		SNR			WYE CHANNEL MARSHES HABITAT ZONE
Animal Assemblage	Bird Nesting Colony		1987-07-07	G5		SNR			
Animal Assemblage	Bird Nesting Colony		2002-08-20	G5		SNR			
Animal Assemblage	Bird Nesting Colony		1987-07-07	G5		SNR			
Vertebrate Animal	Caretta caretta	Loggerhead (Sea Turtle)	2007-06-18	G3		S1B,S1N	LE	LT	CEDAR ISLAND
Vertebrate Animal	Caretta caretta	Loggerhead (Sea Turtle)	2010-07-20	G3		S1B,S1N	LE	LT	NORTH WALLOPS ISLAND, ASSAWOMAN ISLAND, ASSATEAGUE ISLAND
Vascular Plant	Carex silicea	Sea-beach Sedge	1984-06-18	G5		S1			
Vascular Plant	Chamaesyce bombensis	Southern Beach Spurge	1998-09	G4G5		S2			ASSATEAGUE ISLAND
Vascular Plant	Chamaesyce bombensis	Southern Beach Spurge	2006-08-10	G4G5		S2			CEDAR ISLAND
Vascular Plant	Chamaesyce bombensis	Southern Beach Spurge	2011-09-22	G4G5		S2			NORTH WALLOPS ISLAND
Vascular Plant	Chamaesyce bombensis	Southern Beach Spurge	2003-10-01	G4G5		S2			PARRAMORE ISLAND
Vascular Plant	Chamaesyce bombensis	Southern Beach Spurge	1998-09	G4G5		S2			
Vertebrate Animal	Charadrius melodus	Piping Plover	2009-06-09	G3		S2B,S1N	LT	LT	ASSATEAGUE ISLAND
Vertebrate Animal	Charadrius melodus	Piping Plover	2009-06-09	G3		S2B,S1N	LT	LT	ASSAWOMAN ISLAND
Vertebrate Animal	Charadrius melodus	Piping Plover	2009-06-09	G3		S2B,S1N	LT	LT	CEDAR ISLAND
Vertebrate Animal	Charadrius melodus	Piping Plover	2009-06-09	G3		S2B,S1N	LT	LT	METOMPKIN ISLAND
Vertebrate Animal	Charadrius melodus	Piping Plover	2009-06-09	G3		S2B,S1N	LT	LT	NORTH WALLOPS ISLAND
Vertebrate Animal	Charadrius melodus	Piping Plover	2008-06-09	G3		S2B,S1N	LT	LT	PARRAMORE ISLAND
Vertebrate Animal	Charadrius wilsonia	Wilson's Plover	1991-	G5		S1B		LE	ASSATEAGUE ISLAND
Vertebrate Animal	Charadrius wilsonia	Wilson's Plover	2009-06-09	G5		S1B		LE	ASSAWOMAN ISLAND
Vertebrate Animal	Charadrius wilsonia	Wilson's Plover	2009-06-09	G5		S1B		LE	CEDAR ISLAND
Vertebrate Animal	Charadrius wilsonia	Wilson's Plover	2009-06-09	G5		S1B		LE	METOMPKIN ISLAND

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Invertebrate Animal	<i>Cicindela dorsalis dorsalis</i>	Northeastern Beach Tiger Beetle	2009	G4T2		S2	LT	LT	BEACH ISLAND
Invertebrate Animal	<i>Cicindela dorsalis dorsalis</i>	Northeastern Beach Tiger Beetle	1999-	G4T2		S2	LT	LT	BUTCHER CREEK/HACKS NECK
Invertebrate Animal	<i>Cicindela dorsalis dorsalis</i>	Northeastern Beach Tiger Beetle	2009	G4T2		S2	LT	LT	CLAM MARSHES
Invertebrate Animal	<i>Cicindela dorsalis dorsalis</i>	Northeastern Beach Tiger Beetle	2002	G4T2		S2	LT	LT	FREESCHOOL MARSH
Invertebrate Animal	<i>Cicindela dorsalis dorsalis</i>	Northeastern Beach Tiger Beetle	1999-	G4T2		S2	LT	LT	HYSLOPS MARSH
Invertebrate Animal	<i>Cicindela dorsalis dorsalis</i>	Northeastern Beach Tiger Beetle	2009	G4T2		S2	LT	LT	PARKERS MARSH/ISLAND
Invertebrate Animal	<i>Cicindela dorsalis dorsalis</i>	Northeastern Beach Tiger Beetle	1999-	G4T2		S2	LT	LT	SCARBOROUGH NECK
Invertebrate Animal	<i>Cicindela dorsalis dorsalis</i>	Northeastern Beach Tiger Beetle	2004-09-30	G4T2		S2	LT	LT	SOUTHERN TANGIER ISLAND
Invertebrate Animal	<i>Cicindela lepida</i>	Spectral Tiger Beetle	1991-07	G3G4		S1			ASSATEAGUE ISLAND
Vertebrate Animal	<i>Circus cyaneus</i>	Northern Harrier	summer 1995	G5		S1S2B,S3N			FREESCHOOL MARSH, CLAM MARSHES
Vertebrate Animal	<i>Circus cyaneus</i>	Northern Harrier	2004-06	G5		S1S2B,S3N			METOMPKIN ISLAND
Vertebrate Animal	<i>Circus cyaneus</i>	Northern Harrier	1995-07-07	G5		S1S2B,S3N			WALLOPS ISLAND CAUSEWAY MARSHES, NORTH WALLOPS ISLAND, ASSAWOMAN ISLAND
Vascular Plant	<i>Cladium jamaicense</i>	Sawgrass	1995-07-08	G5T5		S2			SAND BRANCH SWAMP HABITAT ZONE
Terrestrial Natural Community	<i>Cladium mariscoides</i> - <i>Drosera intermedia</i> - <i>Eleocharis rostellata</i> Herbaceous Vegetation	Sea-Level Fen	2003-09-11	G1	SOC	S1			ASSAWOMAN CREEK FEN
Terrestrial Natural Community	<i>Cladium mariscoides</i> - <i>Drosera intermedia</i> - <i>Eleocharis rostellata</i> Herbaceous Vegetation	Sea-Level Fen	1993-08-25	G1	SOC	S1			COARDS BRANCH POND
Terrestrial Natural Community	<i>Cladium mariscoides</i> - <i>Drosera intermedia</i> - <i>Eleocharis rostellata</i> Herbaceous Vegetation	Sea-Level Fen	2011-09-22	G1	SOC	S1			MUTTON HUNK FEN
Terrestrial Natural Community	<i>Cladium mariscoides</i> - <i>Drosera intermedia</i> - <i>Eleocharis rostellata</i> Herbaceous Vegetation	Sea-Level Fen	2003-09-10	G1	SOC	S1			WALLOPS ISLAND SEEPS
Animal Assemblage	Colonial Wading Bird Colony		2011-07-10	G5		S2			SOUTHERN TANGIER ISLAND

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Invertebrate Animal	<i>Cordulegaster diastatops</i>	Delta-spotted Spiketail	1995-05-23	G5		S1			
Vascular Plant	<i>Crocianthemum propinquum</i>	Low Frostweed	1995-05-23	G4		S1			WALLOPS ISLAND SEEPS
Vascular Plant	<i>Cuscuta coryli</i>	Hazel Dodder	1975-08-07	G5?		S2?			
Vascular Plant	<i>Cuscuta polygonorum</i>	Smartweed Dodder	1998-09	G5		S2?			ASSATEAGUE ISLAND
Vascular Plant	<i>Cyperus diandrus</i>	Umbrella Flatsedge	1998-09	G5		S1			ASSATEAGUE ISLAND
Vascular Plant	<i>Cyperus diandrus</i>	Umbrella Flatsedge	1998-09	G5		S1			
Vascular Plant	<i>Dichantherium caerulescens</i>	Blue Witch Grass	2006-09-05	G2G3	SOC	S1			ASSATEAGUE ISLAND
Invertebrate Animal	<i>Drasteria graphica</i>	Graphic moth	1998-08-11	G4		S2S3			ASSATEAGUE ISLAND
Vertebrate Animal	<i>Egretta caerulea</i>	Little Blue Heron	2002-06-19	G5		S2B,S3N			CHIMNEY POLE MARSH
Vertebrate Animal	<i>Egretta caerulea</i>	Little Blue Heron	1987-07-07	G5		S2B,S3N			
Vertebrate Animal	<i>Egretta thula</i>	Snowy Egret	2004-06-23	G5		S2B,S3N			CHIMNEY POLE MARSH
Vertebrate Animal	<i>Egretta thula</i>	Snowy Egret	1987-07-07	G5		S2B,S3N			
Vertebrate Animal	<i>Egretta thula</i>	Snowy Egret	1992-06-23	G5		S2B,S3N			
Vertebrate Animal	<i>Egretta thula</i>	Snowy Egret	1987-07-07	G5		S2B,S3N			
Vertebrate Animal	<i>Egretta tricolor</i>	Tricolored Heron	2004-06-23	G5		S2B,S3N			CHIMNEY POLE MARSH
Vertebrate Animal	<i>Egretta tricolor</i>	Tricolored Heron	2002-08-31	G5		S2B,S3N			WIRE NARROWS MARSH
Vertebrate Animal	<i>Egretta tricolor</i>	Tricolored Heron	1987-07-07	G5		S2B,S3N			
Vascular Plant	<i>Eleocharis equisetoides</i>	Horse-tail Spikerush	2000-08-16	G4		S1			COARDS BRANCH POND
Terrestrial Natural Community	<i>Eleocharis rostellata</i> - <i>Spartina patens</i> Tidal Herbaceous Vegetation	Tidal Oligohaline Marsh (Beaked Spikerush - Saltmeadow Cordgrass Estuarine Fringe Type)	1996-09-11	G3		S1?			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Eleocharis rostellata</i> - <i>Spartina patens</i> Tidal Herbaceous Vegetation	Tidal Oligohaline Marsh (Beaked Spikerush - Saltmeadow Cordgrass Estuarine Fringe Type)	1995-05-23	G3		S1?			LITTLE MOSQUITO CREEK
Terrestrial Natural Community	<i>Eleocharis rostellata</i> - <i>Spartina patens</i> Tidal Herbaceous Vegetation	Tidal Oligohaline Marsh (Beaked Spikerush - Saltmeadow Cordgrass Estuarine Fringe Type)	2003-09-10	G3		S1?			MUTTON HUNK FEN
Vascular Plant	<i>Eleocharis uniglumis</i>	Salt-marsh Spikerush	1974-06-27	G4		S1			
Vascular Plant	<i>Erigeron vernus</i>	White-top Fleabane	2003-09-11	G5		S2			ASSAWOMAN CREEK FEN
Vascular Plant	<i>Erigeron vernus</i>	White-top Fleabane	2003-09-10	G5		S2			MUTTON HUNK FEN
Vascular Plant	<i>Erigeron vernus</i>	White-top Fleabane	2003-09-10	G5		S2			WALLOPS ISLAND SEEPS
Vascular Plant	<i>Eriocaulon aquaticum</i>	White Buttons	2000-08-16	G5		S1			COARDS BRANCH POND
Vascular Plant	<i>Eriocaulon decangulare</i>	Ten-angle Pipewort	2003-09-11	G5		S2			ASSAWOMAN CREEK FEN
Vascular Plant	<i>Eriocaulon decangulare</i>	Ten-angle Pipewort	2003-09-09	G5		S2			MUTTON HUNK FEN
Vascular Plant	<i>Eriocaulon decangulare</i>	Ten-angle Pipewort	1991-09-24	G5		S2			WALLOPS ISLAND SEEPS
Vascular Plant	<i>Eriocaulon decangulare</i>	Ten-angle Pipewort	2003-09-10	G5		S2			WALLOPS ISLAND SEEPS
Vascular Plant	<i>Eupatorium anomalum</i>	Anomalous eupatorium	2011-10-18	G2G3	SOC	S1			NORTH WALLOPS ISLAND
Vertebrate Animal	<i>Falco peregrinus</i>	Peregrine Falcon	1998-	G4		S1B,S2N		LT	GREAT FOX ISLAND
Vertebrate Animal	<i>Falco peregrinus</i>	Peregrine Falcon	1998-	G4		S1B,S2N		LT	METOMPKIN ISLAND

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Vertebrate Animal	Falco peregrinus	Peregrine Falcon	1998-	G4		S1B,S2N		LT	NORTH WALLOPS ISLAND
Vertebrate Animal	Falco peregrinus	Peregrine Falcon	1998-	G4		S1B,S2N		LT	PARKERS MARSH/ISLAND
Vertebrate Animal	Falco peregrinus	Peregrine Falcon	1994-	G4		S1B,S2N		LT	PARRAMORE ISLAND
Vertebrate Animal	Falco peregrinus	Peregrine Falcon	1998	G4		S1B,S2N		LT	
Vertebrate Animal	Falco peregrinus	Peregrine Falcon	1998-	G4		S1B,S2N		LT	
Vertebrate Animal	Falco peregrinus	Peregrine Falcon	1998-	G4		S1B,S2N		LT	
Terrestrial Natural Community	Fraxinus profunda - Nyssa biflora - (Fraxinus pennsylvanica) / Ilex verticillata / Polygonum arifolium Tidal Forest	Freshwater Tidal Hardwood Swamp	2011-09-21	G3		S3			PITTS CREEK
Vertebrate Animal	Gelochelidon nilotica	Gull-billed Tern	2008-06-09	G5		S2B		LT	CEDAR ISLAND
Vertebrate Animal	Gelochelidon nilotica	Gull-billed Tern	2007-06-09	G5		S2B		LT	CUNJER CHANNEL MARSH TUMPS HABITAT ZONE
Vertebrate Animal	Gelochelidon nilotica	Gull-billed Tern	2007-06-09	G5		S2B		LT	DAWSON SHOALS
Vertebrate Animal	Gelochelidon nilotica	Gull-billed Tern	2008-06-09	G5		S2B		LT	HUMMOCK COVE MARSH HABITAT ZONE
Vertebrate Animal	Gelochelidon nilotica	Gull-billed Tern	1991-06-16	G5		S2B		LT	HUMMOCK COVE MARSH HABITAT ZONE
Vertebrate Animal	Gelochelidon nilotica	Gull-billed Tern	2006-06-09	G5		S2B		LT	METOMPKIN ISLAND
Vertebrate Animal	Gelochelidon nilotica	Gull-billed Tern	1991-06-16	G5		S2B		LT	WYE CHANNEL MARSHES HABITAT ZONE
Vertebrate Animal	Gelochelidon nilotica	Gull-billed Tern	1987-07-07	G5		S2B		LT	
Vertebrate Animal	Haliaeetus leucocephalus	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - ASSATEAGUE ISLAND
Vertebrate Animal	Haliaeetus leucocephalus	Bald Eagle	1996-	G5		S2S3B,S3N		LT	BAEA - BELL NECK HABITAT ZONE
Vertebrate Animal	Haliaeetus leucocephalus	Bald Eagle	1998-	G5		S2S3B,S3N		LT	BAEA - BUTCHER CREEK - HACKS NECK
Vertebrate Animal	Haliaeetus leucocephalus	Bald Eagle	2001-	G5		S2S3B,S3N		LT	BAEA - CHANCETOWN HABITAT ZONE
Vertebrate Animal	Haliaeetus leucocephalus	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - COLDKALL CREEK HABITAT ZONE
Vertebrate Animal	Haliaeetus leucocephalus	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - CRADDOCK NECK HABITAT ZONE
Vertebrate Animal	Haliaeetus leucocephalus	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - CROCKETT TOWN HABITAT ZONE
Vertebrate Animal	Haliaeetus leucocephalus	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - FREESCHOOL MARSH
Vertebrate Animal	Haliaeetus leucocephalus	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - LITTLE MOSQUITO CREEK

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	1995-05-23	G5		S2S3B,S3N		LT	BAEA - LITTLE MOSQUITO CREEK
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - LONG RIDGE HABITAT ZONE
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - MAPPSBURG HABITAT ZONE
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	2009-07	G5		S2S3B,S3N		LT	BAEA - NORTH WALLOPS ISLAND
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	1996-	G5		S2S3B,S3N		LT	BAEA - OLD TREE ISLAND HABITAT ZONE
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - OLD TREE ISLAND HABITAT ZONE
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - PITTS CREEK
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - ROSS BRANCH HABITAT ZONE
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	2001-	G5		S2S3B,S3N		LT	BAEA - UPPER OCCOHANNOCK CREEK HABITAT ZONE
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	2002-	G5		S2S3B,S3N		LT	BAEA - UPSHUR NECK HABITAT ZONE
Vertebrate Animal	<i>Haliaeetus leucocephalus</i>	Bald Eagle	2000-	G5		S2S3B,S3N		LT	BAEA - WILDCAT MARSH
Vascular Plant	<i>Heliotropium curassavicum</i>	Seaside Heliotrope	1966-09-07	G5		S1			
Vascular Plant	<i>Heliotropium curassavicum</i>	Seaside Heliotrope	1941-06-22	G5		S1			
Vertebrate Animal	<i>Himantopus mexicanus</i>	Black-necked Stilt	2001-08-	G5		S1B			WIRE NARROWS MARSH
Terrestrial Natural Community	<i>Hudsonia tomentosa</i> / <i>Cyperus grayi</i> Dwarf-shrubland	Beach Heather Dwarf Dune Scrub	2003-10-01	G2G3	SOC	S2?			PARRAMORE ISLAND
Vertebrate Animal	<i>Hydroprogne caspia</i>	Caspian Tern	1991-	G5		S1B,S2N			
Vascular Plant	<i>Hypericum boreale</i>	Northern St. John's-wort	2000-08-16	G5		S2			
Vascular Plant	<i>Juncus megacephalus</i>	Big-head Rush	1998-09	G4G5		S2			ASSATEAGUE ISLAND
Vascular Plant	<i>Juncus megacephalus</i>	Big-head Rush	2011-09-20	G4G5		S2			NORTH WALLOPS ISLAND
Vascular Plant	<i>Juncus pelocarpus</i>	Brown-fruited Rush	1993-08-25	G5		S1			COARDS BRANCH POND
Vascular Plant	<i>Juncus pelocarpus</i>	Brown-fruited Rush	1991-09-16	G5		S1			MUTTON HUNK FEN
Vascular Plant	<i>Juncus pelocarpus</i>	Brown-fruited Rush	1992-10-06	G5		S1			
Vascular Plant	<i>Juncus pelocarpus</i>	Brown-fruited Rush	1992-08-21	G5		S1			
Vascular Plant	<i>Kalmia angustifolia</i>	Sheep-laurel	1975-08-07	G5		S2			
Vertebrate Animal	<i>Laterallus jamaicensis</i>	Black Rail	1989-05-26	G4		S2B,S2N			FREESCHOOL MARSH
Vascular Plant	<i>Lithospermum carolinense</i>	Golden Puccoon	1970-04-24	G4G5		S1			

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Vascular Plant	<i>Lobelia elongata</i>	Elongated Lobelia	2001-09-11	G4G5		S1			PITTS CREEK
Invertebrate Animal	<i>Lycaena hyllus</i>	Bronze Copper	2002-07-04	G4G5		S1			JENKINS BRIDGE
Invertebrate Animal	<i>Lycaena hyllus</i>	Bronze Copper	1986-09-01	G4G5		S1			
Terrestrial Natural Community	<i>Myrica cerifera</i> - <i>Baccharis halimifolia</i> / <i>Spartina patens</i> Shrubland	Southern Bayberry Interdune Shrubland	2010-09-20	G3G4		S2S3			NORTH WALLOPS ISLAND
Terrestrial Natural Community	<i>Myrica cerifera</i> - <i>Rosa palustris</i> / <i>Osmunda regalis</i> var. <i>spectabilis</i> - <i>Thelypteris palustris</i> var. <i>pubescens</i> Tidal Shrubland	Oligohaline Tidal Shrub Swamp	2011-09-21	G4		S3			PITTS CREEK
Vascular Plant	<i>Myriophyllum humile</i>	Low Water-milfoil	1991-10-09	G5		S1			COARDS BRANCH POND
Vascular Plant	<i>Nymphoides aquatica</i>	Big Floating-heart	2000-08-16	G5		S1			COARDS BRANCH POND
Aquatic Natural Community	OC-Chincoteague Second Order Stream	OC-Chincoteague Second Order Stream	2011-01	G2	SOC	S2			WATTSVILLE BRANCH SCU
Aquatic Natural Community	OC-Eastern Lower Delmarva First Order Stream	OC-Eastern Lower Delmarva First Order Stream	2011-01	G2G3	SOC	S2S3			NORTH FORK PARKER CREEK BELOW RT. 661 SCU
Aquatic Natural Community	OC-Pokomoke-Western Lower Delmarva Second Order Stream	OC-Pokomoke-Western Lower Delmarva Second Order Stream	2011-01	G2G3	SOC	S2S3			TITLOW CREEK AT RT. 718 SCU
Terrestrial Natural Community	<i>Panicum virgatum</i> - <i>Schoenoplectus pungens</i> Herbaceous Vegetation	Interdune Swale / Pond (Switchgrass Type)	1996-09-04	G2G4		S2?			ASSATEAGUE ISLAND
Invertebrate Animal	<i>Papaipema araliae</i>	Aralia Shoot Borer Moth	1994-09-06	G3G4		S2S3			NORTH WALLOPS ISLAND
Invertebrate Animal	<i>Papaipema duovata</i>	Seaside Goldenrod Stem Borer	1998-10-14	G4		S1S3			ASSATEAGUE ISLAND
Invertebrate Animal	<i>Papaipema duovata</i>	Seaside Goldenrod Stem Borer	2003-10-22	G4		S1S3			MUTTON HUNK FEN
Invertebrate Animal	<i>Papaipema duovata</i>	Seaside Goldenrod Stem Borer	1995-10-12	G4		S1S3			
Invertebrate Animal	<i>Papaipema duovata</i>	Seaside Goldenrod Stem Borer	1995-10-12	G4		S1S3			
Vascular Plant	<i>Paspalum distichum</i>	Joint Paspalum	1998-09	G5		S2			ASSATEAGUE ISLAND
Vertebrate Animal	<i>Pelecanus occidentalis</i>	Brown Pelican	1992-08-31	G4		S2B,S3N			METOMPKIN ISLAND
Terrestrial Natural Community	<i>Pinus taeda</i> - (<i>Quercus falcata</i> , <i>Prunus serotina</i>) / <i>Myrica cerifera</i> / <i>Vitis rotundifolia</i> Forest	Maritime Loblolly Pine Forest	1996-10-3	G2	SOC	S2			ASSATEAGUE ISLAND

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Terrestrial Natural Community	<i>Pinus taeda</i> - (<i>Quercus falcata</i> , <i>Prunus serotina</i>) / <i>Myrica cerifera</i> / <i>Vitis rotundifolia</i> Forest	Maritime Loblolly Pine Forest	1996-10-01	G2	SOC	S2			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Pinus taeda</i> - (<i>Quercus falcata</i> , <i>Prunus serotina</i>) / <i>Myrica cerifera</i> / <i>Vitis rotundifolia</i> Forest	Maritime Loblolly Pine Forest	1996-10-03	G2	SOC	S2			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Pinus taeda</i> / <i>Hudsonia tomentosa</i> Woodland	Loblolly Pine / Beach Heather Dune Woodland	1996-09-30	G1G2	SOC	S1S2			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Pinus taeda</i> / <i>Hudsonia tomentosa</i> Woodland	Loblolly Pine / Beach Heather Dune Woodland	1996-10-03	G1G2	SOC	S1S2			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Pinus taeda</i> / <i>Myrica cerifera</i> / <i>Osmunda regalis</i> var. <i>spectabilis</i> Forest	Maritime Wet Loblolly Pine Forest	1996-09-30	G3		S2?			ASSATEAGUE ISLAND
Vascular Plant	<i>Plantago maritima</i> var. <i>juncooides</i>	Seaside Plantain	1995-07-13	G5T5		S1			
Vascular Plant	<i>Plantago maritima</i> var. <i>juncooides</i>	Seaside Plantain	1987-10-25	G5T5		S1			
Vascular Plant	<i>Plantago maritima</i> var. <i>juncooides</i>	Seaside Plantain	1966-09-07	G5T5		S1			
Vertebrate Animal	<i>Plegadis falcinellus</i>	Glossy Ibis	2004-06-23	G5		S2B,S1N			
Vertebrate Animal	<i>Plegadis falcinellus</i>	Glossy Ibis	1987-07-07	G5		S2B,S1N			
Vascular Plant	<i>Polygonum glaucum</i>	Sea-beach Knotweed	1996-09-05	G3		S1S2			ASSATEAGUE ISLAND
Vascular Plant	<i>Polygonum glaucum</i>	Sea-beach Knotweed	1966-09-07	G3		S1S2			
Vertebrate Animal	<i>Porzana carolina</i>	Sora	1990-06	G5		S1B,S2N			FREESCHOOL MARSH
Terrestrial Natural Community	<i>Prunus serotina</i> / <i>Smilax rotundifolia</i> / <i>Schizachyrium littorale</i> Woodland	Black Cherry Xeric Dune Woodland	1996-10-01	G1G2	SOC	S1			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Prunus serotina</i> / <i>Smilax rotundifolia</i> / <i>Schizachyrium littorale</i> Woodland	Black Cherry Xeric Dune Woodland	2011-09-20	G1G2	SOC	S1			NORTH WALLOPS ISLAND
Vascular Plant	<i>Puccinellia fasciculata</i>	Salt Marsh Goosegrass	1975-03-23	G3G5		S1			
Vascular Plant	<i>Puccinellia fasciculata</i>	Salt Marsh Goosegrass	1934-07-26	G3G5		S1			
Vascular Plant	<i>Pycnanthemum setosum</i>	Awned Mountain-mint	1997-08-19	G4		S1			PITTS CREEK
Vascular Plant	<i>Pycnanthemum setosum</i>	Awned Mountain-mint	2000-07-08	G4		S1			SANDY BOTTOM BRANCH HABITAT ZONE

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Terrestrial Natural Community	Quercus (phellos, pagoda, michauxii) / Ilex opaca - Clethra alnifolia / Woodwardia areolata Forest	Non-Riverine Wet Hardwood Forest (Northern Coastal Plain Type)	1991-06-19	G2?	SOC	S2			BELLE HAVEN DELMARVA BAY HABITAT ZONE
Vertebrate Animal	Rallus limicola	Virginia Rail	1989-05-26	G5		S2B,S3N			FREESCHOOL MARSH
Vascular Plant	Rhynchospora alba	White Beakrush	2003-09-11	G5		S2			ASSAWOMAN CREEK FEN
Vascular Plant	Rhynchospora alba	White Beakrush	2000-08-16	G5		S2			COARDS BRANCH POND
Vascular Plant	Rhynchospora alba	White Beakrush	2003-09-09	G5		S2			MUTTON HUNK FEN
Vascular Plant	Rhynchospora alba	White Beakrush	2003-09-10	G5		S2			WALLOPS ISLAND SEEPS
Vascular Plant	Rhynchospora oligantha	Few-flowered Beakrush	1992-08-21	G4		S1			WALLOPS ISLAND SEEPS
Vascular Plant	Rhynchospora scirpoides	Long-beaked Baldrush	1993-08-25	G4		S1			COARDS BRANCH POND
Vertebrate Animal	Rynchops niger	Black Skimmer	2003-06-18	G5		S2B,S1N			ASSAWOMAN ISLAND
Vertebrate Animal	Rynchops niger	Black Skimmer	2008-06-09	G5		S2B,S1N			CEDAR ISLAND
Vertebrate Animal	Rynchops niger	Black Skimmer	1992-06-24	G5		S2B,S1N			CHIMNEY POLE MARSH
Vertebrate Animal	Rynchops niger	Black Skimmer	2008-06-09	G5		S2B,S1N			CUNJER CHANNEL MARSH TUMPS HABITAT ZONE
Vertebrate Animal	Rynchops niger	Black Skimmer	2007-06-09	G5		S2B,S1N			DAWSON SHOALS
Vertebrate Animal	Rynchops niger	Black Skimmer	2008-06-09	G5		S2B,S1N			METOMPkin ISLAND
Vertebrate Animal	Rynchops niger	Black Skimmer	2002-08-20	G5		S2B,S1N			WIRE NARROWS MARSH
Vascular Plant	Sabatia campanulata	Slender Marsh Pink	1979-09-28	G5		S2			
Invertebrate Animal	Schinia siren	A Flower Moth	1994-09-07	GNR		S1S2			
Vertebrate Animal	Sciurus niger cinereus	Delmarva Fox Squirrel	1994-02-10	G5T3		S1	LE	LE	
Vascular Plant	Scleria verticillata	Whorled Nutrush	1998-09	G5		S2			ASSATEAGUE ISLAND
Vascular Plant	Sclerolepis uniflora	One-flower Sclerolepis	2003-09-11	G4		S1			ASSAWOMAN CREEK FEN
Terrestrial Natural Community	Spartina alterniflora - Spartina patens Tidal Herbaceous Vegetation	Low Salt Marsh (Salt Panne Type)	2011-09-20	G5		S3?			NORTH WALLOPS ISLAND
Terrestrial Natural Community	Spartina alterniflora Tidal Herbaceous Vegetation	Low Salt Marsh (Saltmarsh Cordgrass Type)	2003-05-14	G5		S5			PARRAMORE ISLAND
Terrestrial Natural Community	Spartina cynosuroides Tidal Herbaceous Vegetation	Tidal Oligohaline Marsh (Big Cordgrass Type)	2011-09-21	G4		S4			PITTS CREEK
Terrestrial Natural Community	Spartina patens - (Schoenoplectus robustus) Herbaceous Vegetation	Interdune Swale (Saltmeadow Cordgrass Brackish Type)	1996-10-01	G3		S2?			ASSATEAGUE ISLAND

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Terrestrial Natural Community	<i>Spartina patens</i> - (<i>Schoenoplectus robustus</i>) Herbaceous Vegetation	Interdune Swale (Saltmeadow Cordgrass Brackish Type)	1996-10-02	G3		S2?			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Spartina patens</i> - <i>Distichlis spicata</i> Tidal Herbaceous Vegetation	High Salt Marsh	2001-10-11	G4G5		S4S5			PARKERS MARSH/ISLAND
Terrestrial Natural Community	<i>Spartina patens</i> - <i>Fimbristylis</i> (<i>castanea</i> , <i>caroliniana</i>) - <i>Cyperus filicinus</i> - (<i>Schoenoplectus pungens</i>) Herbaceous Vegetation	Interdune Swale (Northern Mixed Grassland Type)	1996-10-02	G1G2	SOC	S1?			ASSATEAGUE ISLAND
Terrestrial Natural Community	<i>Spartina patens</i> - <i>Fimbristylis</i> (<i>castanea</i> , <i>caroliniana</i>) - <i>Cyperus filicinus</i> - (<i>Schoenoplectus pungens</i>) Herbaceous Vegetation	Interdune Swale (Northern Mixed Grassland Type)	2011-09-20	G1G2	SOC	S1?			NORTH WALLOPS ISLAND
Nonvascular Plant	<i>Sphagnum portoricense</i>	Puerto Rico Peatmoss	1993-04-29	G5		S1S2			COARDS BRANCH POND
Vertebrate Animal	<i>Sternula antillarum</i>	Least Tern	2004-06-23	G4		S2B			ASSAWOMAN ISLAND
Vertebrate Animal	<i>Sternula antillarum</i>	Least Tern	2008-06-09	G4		S2B			CEDAR ISLAND
Vertebrate Animal	<i>Sternula antillarum</i>	Least Tern	2008-06-09	G4		S2B			METOMPKIN ISLAND
Vertebrate Animal	<i>Thalasseus maximus</i>	Royal Tern	2006-06-09	G5		S2B			DAWSON SHOALS
Vascular Plant	<i>Triadenum fraseri</i>	Fraser's Marsh St. John's-wort	1975-08-08	G5		S1			
Vascular Plant	<i>Trillium pusillum</i> var. <i>virginianum</i>	Virginia Least Trillium	1996-04-12	G3T2	SOC	S2			PETTIT BRANCH
Vascular Plant	<i>Trillium pusillum</i> var. <i>virginianum</i>	Virginia Least Trillium	ND	G3T2	SOC	S2			
Terrestrial Natural Community	<i>Typha angustifolia</i> - <i>Hibiscus moscheutos</i> Herbaceous Vegetation	Interdune Pond (Narrow-Leaved Cattail - Eastern Rose-Mallow Type)	2011-09-19	G3		SU			NORTH WALLOPS ISLAND
Vascular Plant	<i>Utricularia juncea</i>	Southern Bladderwort	2003-09-11	G5		S2			ASSAWOMAN CREEK FEN
Vascular Plant	<i>Utricularia juncea</i>	Southern Bladderwort	1993-08-25	G5		S2			COARDS BRANCH POND
Vascular Plant	<i>Utricularia juncea</i>	Southern Bladderwort	1991-09-16	G5		S2			MUTTON HUNK FEN
Vascular Plant	<i>Utricularia juncea</i>	Southern Bladderwort	1992-08-21	G5		S2			WALLOPS ISLAND SEEPS
Vascular Plant	<i>Vaccinium macrocarpon</i>	Large Cranberry	1998-09	G4		S2			ASSATEAGUE ISLAND
Vascular Plant	<i>Wolffia columbiana</i>	Columbia Water-meal	1975-07-17	G5		S1			

Group Name	Scientific Name	Common Name	Last Observed	Global Rank	FWS Species of Concern	State Rank	Federal Status	State Status	Site Name
Terrestrial Natural Community	Zizania aquatica - Pontederia cordata - Peltandra virginica - Polygonum punctatum Tidal Herbaceous Vegetation	Tidal Freshwater Marsh (Wild Rice - Mixed Forbs Type)	2011-09-21	G4?		S4?			PITTS CREEK

Accomack County

Conservation Sites - TABLE II Natural Area Preserves - TABLE III

Site Name	Biodiversity Rank
ASSATEAGUE ISLAND	B1
ASSAWOMAN CREEK FEN	B2
ASSAWOMAN ISLAND	B2
BAEA - ASSATEAGUE ISLAND	B5
BAEA - BELL NECK	B5
BAEA - BUTCHER CREEK - HACKS NECK	B5
BAEA - CHANCETOWN	B5
BAEA - COLDKALL CREEK	B5
BAEA - CRADDOCK NECK	B5
BAEA - CROCKETT TOWN	B5
BAEA - FREESCHOOL MARSH	B5
BAEA - LITTLE MOSQUITO CREEK	B5
BAEA - LONG RIDGE	B5
BAEA - MAPPSBURG	B5
BAEA - NORTH WALLOPS ISLAND	B5
BAEA - OLD TREE ISLAND	B5
BAEA - PITTS CREEK	B5
BAEA - POWELLS BAY	B5
BAEA - ROSS BRANCH	B5
BAEA - UPPER OCCOHANNOCK CREEK	B5
BAEA - UPSHUR CREEK	B5
BAEA - UPSHUR NECK	B5
BAEA - WILDCAT MARSH	B5
BEACH ISLAND	B5

Site Name	Biodiversity Rank
BELLE HAVEN DELMARVA BAY	B3
BUTCHER CREEK/HACKS NECK	B4
CEDAR ISLAND	B2
CHIMNEY POLE MARSH	B4
CLAM MARSHES	B4
COARDS BRANCH POND	B2
CUNJER CHANNEL MARSH TUMPS	B5
CURLEW BAY MARSH	B5
DAWSON SHOALS	B5
FREESCHOOL MARSH	B4
GREAT FOX ISLAND	B4
HUMMOCK COVE MARSH	B5
HYSLOPS MARSH	B4
JENKINS BRIDGE	B5
LITTLE MOSQUITO CREEK	B3
METOMPKIN ISLAND	B2
MUTTON HUNK FEN	B2
NEW CHURCH POWERLINE WETLAND	B4
NORTH FORK PARKER CREEK BELOW RT. 661 SCU	B3
NORTH WALLOPS ISLAND	B2
PARKERS MARSH/ISLAND	B2
PARRAMORE ISLAND	B2
PETTIT BRANCH	B5
PITTS CREEK	B2

Site Name	Biodiversity Rank
SAND BRANCH SWAMP	B5
SANDY BOTTOM BRANCH	B5
SCARBOROUGH NECK	B3
SOUTHERN TANGIER ISLAND	B4
TITLOW CREEK AT RT. 718 SCU	B3
UPSHUR CREEK	B5
WALLOPS ISLAND CAUSEWAY MARSHES	B4
WALLOPS ISLAND SEEPS	B2
WATTSVILLE BRANCH SCU	B3
WILDCAT MARSH	B4
WIRE NARROWS MARSH	B5
WYE CHANNEL MARSHES	B5

Natural Area Preserves - Table III
Parkers Marsh
Parramore Island
Mutton Hunk Fen
Marks and Jacks Islands

Appendix H

Map of Localities with
Natural Heritage Information

Virginia Localities with Natural Heritage Information

Western Localities

Albemarle
 Augusta
 Bedford
 Botetourt
 Campbell
 Carroll
 City of Danville
 City of Emporia
 City of Lynchburg
 Clarke
 Culpeper
 Cumberland
 Dinwiddie
 Fauquier
 Floyd
 Franklin
 Goochland
 Grayson
 Loudoun
 Mecklenburg
 Montgomery
 Nelson
 Orange
 Page
 Pulaski
 Roanoke
 Rockingham
 Scott
 Smyth
 Southampton
 Tazewell
 Town of Blacksburg
 Town of Leesburg
 Town of Rocky Mount
 Wise

Coastal Localities

Accomack
 Arlington
 Charles City
 Chesterfield
 City of Alexandria
 City of Chesapeake
 City of Colonial Heights
 City of Fredericksburg
 City of Hopewell
 City of Newport News
 City of Norfolk
 City of Portsmouth
 City of Virginia Beach
 City of Williamsburg
 Essex
 Fairfax
 Gloucester
 Hanover
 Henrico
 Isle of Wight
 James City
 King George
 King William
 Lancaster
 Mathews
 New Kent
 Northampton
 Northumberland
 Port Royal
 Prince George
 Prince William
 Richmond
 Spotsylvania
 Stafford
 Westmoreland
 York

Legend

-  Coastal Localities with Data
-  Virginia Counties
-  Western Localities with Data

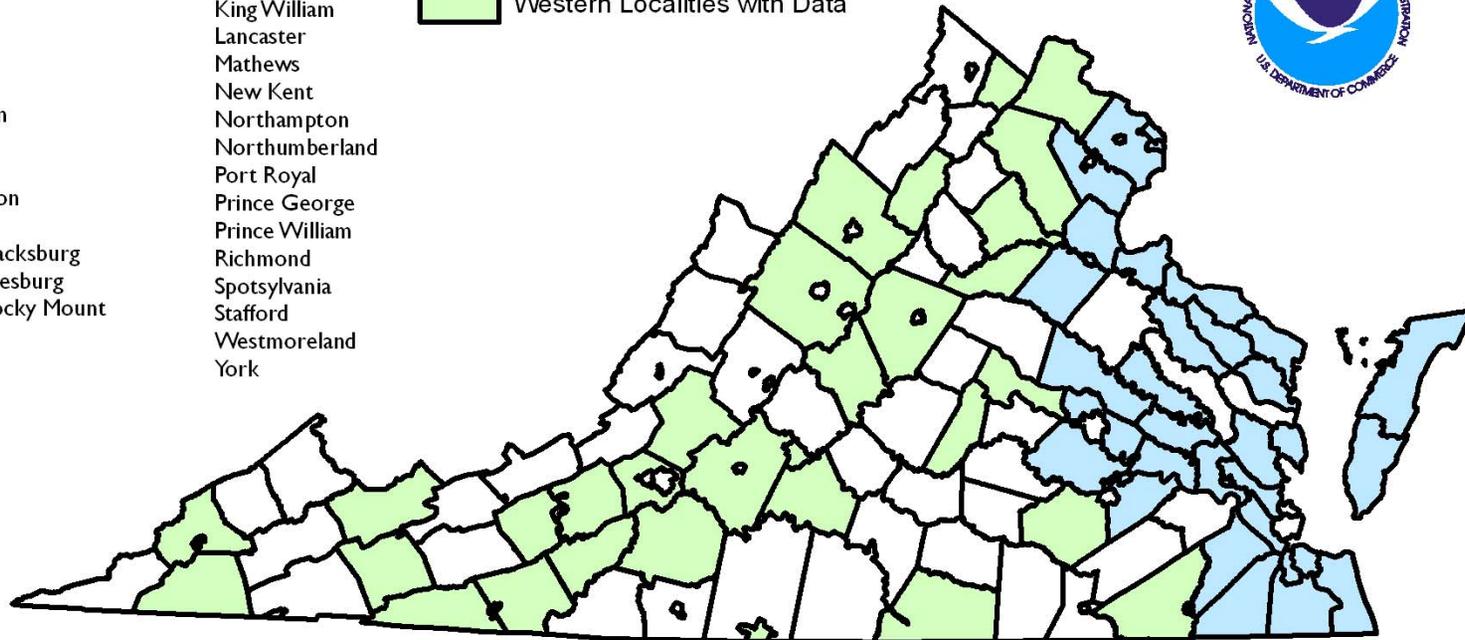
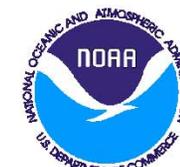


Department of Conservation & Recreation

CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES



Virginia Coastal Zone
 MANAGEMENT PROGRAM

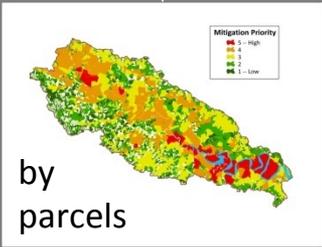
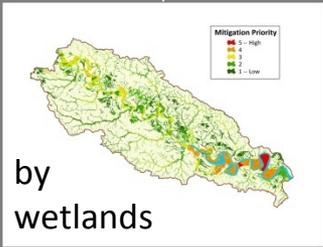
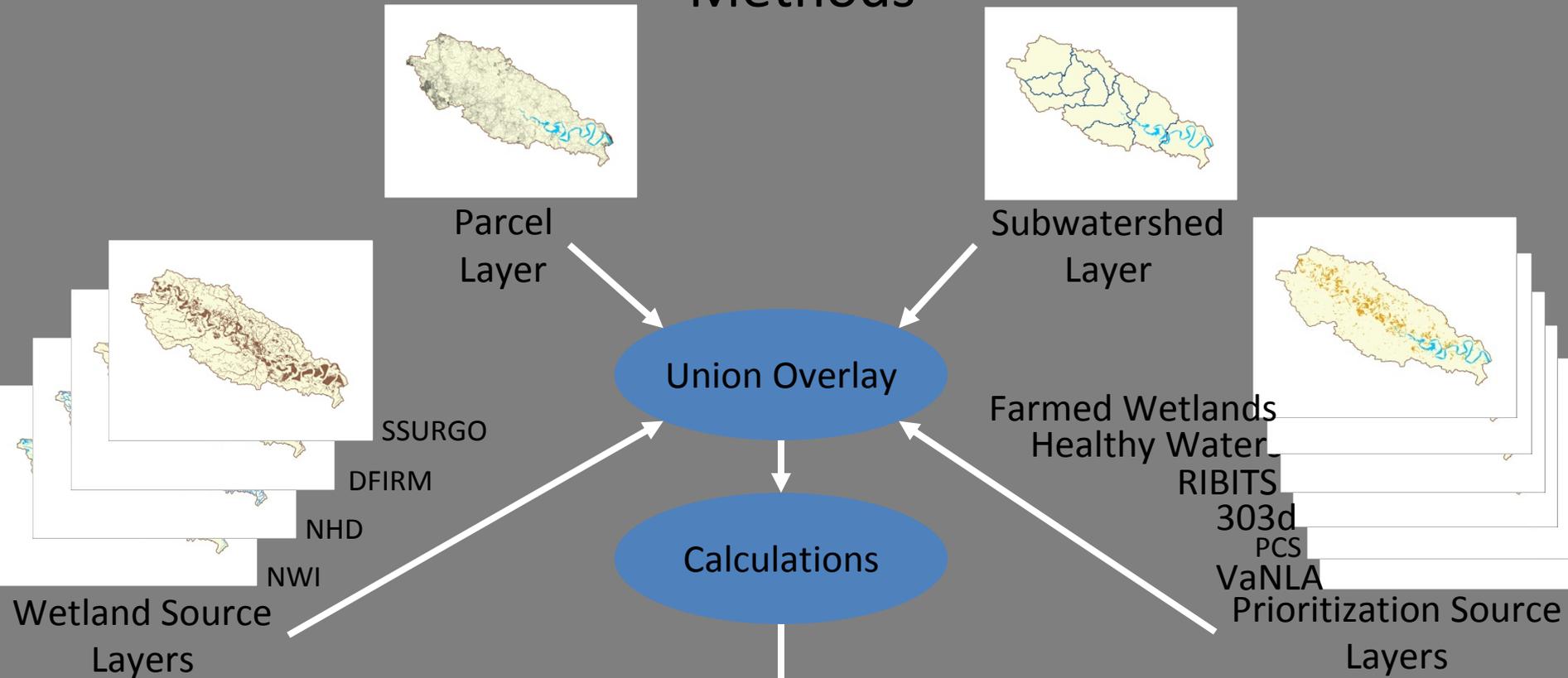


NOAA Grant # NA11NOS4190122 FY 2011 Task # 7
 Prepared by DCR-DNH September 21, 2012

Appendix I

Wetland Restoration Catalog

Methods

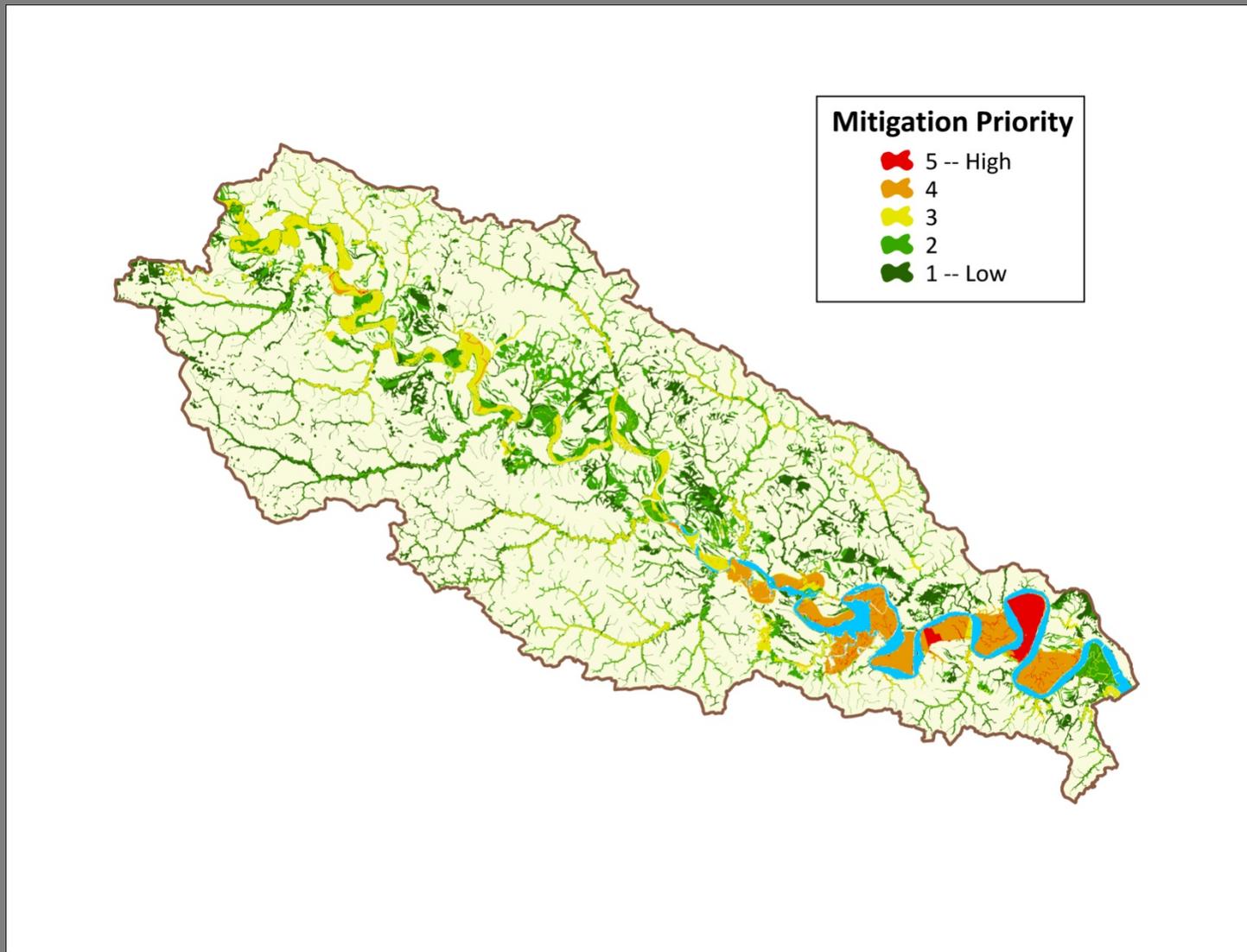


Map Products

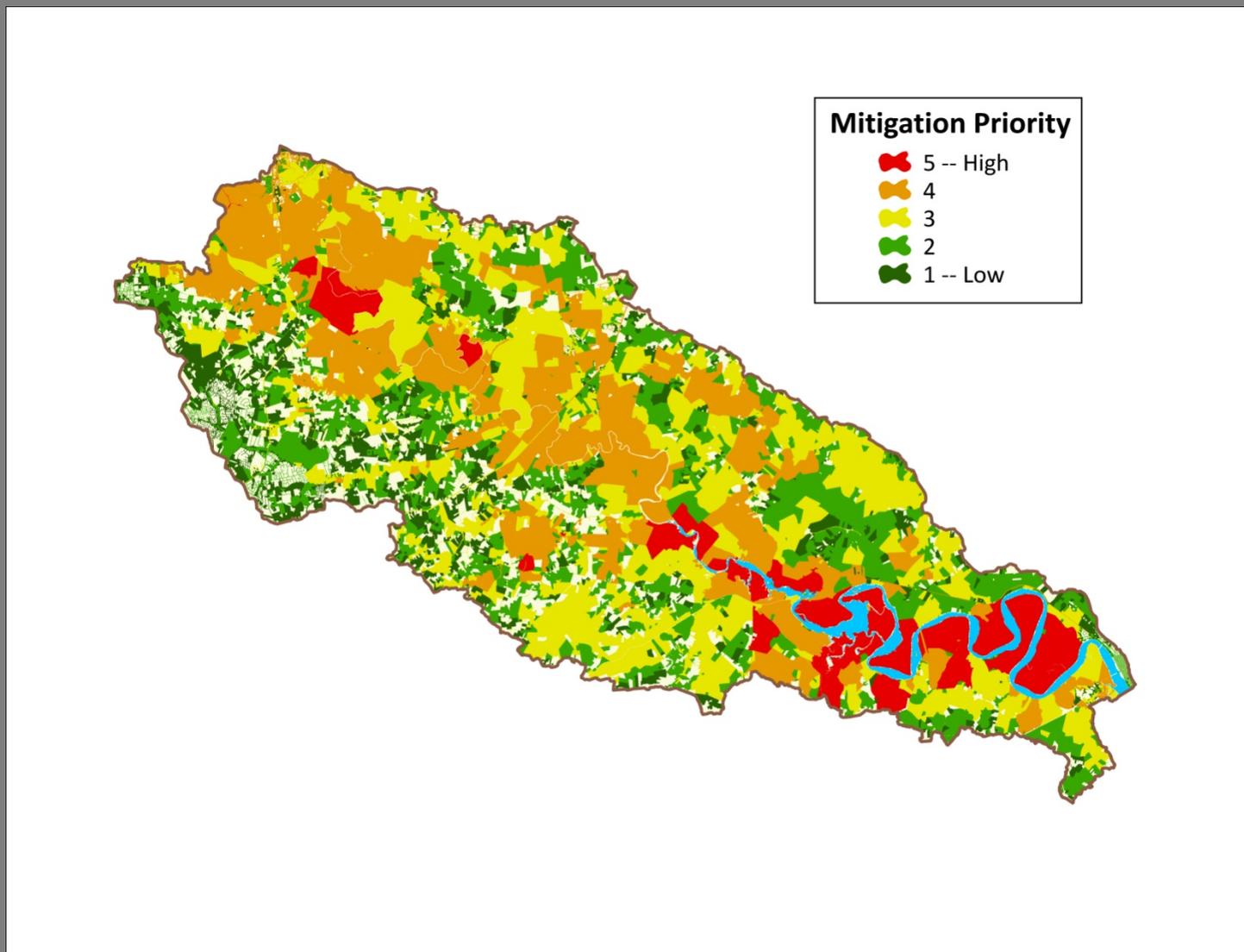
ParID	WSID_1	WSID_2	WSID_3	WSID_4	PS1W	PS2W	PS3W	PS4W	PS5W	WetOver	MitPrior	CompPrior	Reclass5
127-584	NW199332	NH002080106006070	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006075	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006076	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006070	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006075	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006070	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006076	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006075	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006070	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006075	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5
127-584	NW199332	NH002080106006076	DFIRM2134	SSURGO21133	2	3	1	0	3	4	9	13	5

Tabular Product

Catalog Displayed by Wetlands



Catalog Displayed by Parcels



Appendix J

Coastal Virginia Ecological
Value Assessment (VEVA)
Landscape Chesapeake



© Chesapeake Bay Program (Chesapeake)

Home > Focus and Plan > Priority Places > LandScope Chesapeake > Conservation Priorities > Wildlife and Habitat Conservation >

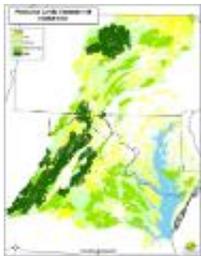
Wildlife and Habitat Conservation Priorities in the Chesapeake

Conserving intact natural landscapes obviously yields basic benefits to the plants and animals that depend on them, but human communities gain considerable from such transactions as well. These data identify biologically significant areas of the Chesapeake and chart out possible protection and connection scenarios.



© Chesapeake Bay Program

Wildlife and Habitat Priorities in the Chesapeake



Chesapeake Ecological Network

The Ecological Network represents "core areas" thought to provide breeding habitat for native wildlife and suitable conditions for native plants.

[Read More](#)



Delaware Ecological Network

The Delaware Ecological Network is a statewide conservation network providing a consistent framework to help identify and prioritize areas for natural resource protection.

[Read More](#)



Maryland Targeted Ecological Areas

Targeted Ecological Areas are a limited number of areas that rank exceptionally high for ecological criteria and that have a practical potential for preservation.

[Read More](#)



Pennsylvania Core Habitat

This layer contains the Core Habitat of Natural Heritage Areas identified through the County Natural Heritage Inventory project of the Pennsylvania Natural Heritage Program.

[Read More](#)



Pennsylvania Landscape Conservation Areas

Landscape Conservation Area refers to large contiguous areas that are important because of their size, open space, habitats and/or inclusion of one or more core habitats for species of concern.

[Read More](#)



Supporting Landscape

Supporting Landscape refers to areas surrounding or contiguous to core habitats that maintain vital ecological processes or secondary habitat for sensitive natural features that may be able to accommodate some types of low-impact activities.

[Read More](#)



Pennsylvania Conservation Landscape Initiative

Pennsylvania's Conservation Landscape Initiatives reflect the results of strategic on-the-ground collaborations between public and private stakeholders to develop a value-driven, place-based approach to conservation.

[Read More](#)



Coastal Virginia Ecological Value Assessment (VEVA)

The Coastal Virginia Ecological Value Assessment (VEVA) dataset ranks terrestrial and aquatic areas on ecological value.

[Read More](#)



Virginia Natural Landscape Assessment, Ecological Cores

The Virginia Natural Heritage Program has identified a network of natural lands for the commonwealth of Virginia and ranked those lands based upon their importance to maintaining healthy, interconnected, functioning ecosystems at the landscape level.

[Read More](#)



Virginia Priority Wildlife Diversity Conservation Areas

The PWDCAs highlight areas due to the presence of unfragmented habitat, wetlands, identified habitat for rare species, and/or special wildlife features such as waterbird colonies, designated important bird areas, or anadromous fish use areas.

[Read More](#)



Virginia Biodiversity Assessment

The Virginia Biodiversity Assessment displays lands with known and predicted biodiversity, based on data and information from the Virginia Department of Conservation and Recreation-Division of Natural Heritage and the Virginia Dept. of Game and Inland Fisheries.

[Read More](#)



Virginia State Wildlife Action Plan Essential Habitat for Tier I and Tier II Species of Greatest Conservation Need

The Wildlife Action Plan Mapped Habitats layer shows locations of confirmed and/or potential habitat of Tier 1 and Tier II Species of Greatest Conservation Need created for the Virginia Wildlife Action Plan (WAP).

[Read More](#)



© Bruce McNitt/Panoramic Images (Virginia)

[Home](#) > [Explore Places and Topics](#) > [Find Your State](#) > [Virginia](#) >

Coastal Virginia Ecological Value Assessment (VEVA)

Overview

The Coastal Virginia Ecological Value Assessment (VEVA) dataset combines scientific data and best professional judgment to rank terrestrial and aquatic areas on a 1-to-5 scale of ecological value, with 5 representing the highest conservation priority. These values can be used to prioritize areas for preservation, develop strategies for special area management actions, or to build awareness about Virginia's ecological integrity throughout the Coastal Zone.

Data Layer Description

Source

Virginia Department of Environmental Quality- Coastal Zone Management Program

Virginia Commonwealth University- Center for Environmental Studies

Virginia Department of Conservation and Recreation Divisions of Natural Heritage and Stormwater Management

Virginia Department of Game and Inland Fisheries

Virginia Institute of Marine Science Center for Coastal Resources Management

What this data layer represents

Location

Coastal Zone counties of the Commonwealth of Virginia

Scale: 1:100,000

Description

The Coastal Virginia Ecological Value Assessment (VEVA) was developed to be a comprehensive, GIS-based tool to guide the land use and conservation planning of local governments and planning districts in the Coastal Zone of Virginia. Coastal VEVA improves upon and replaces the former Priority Conservation Areas (PCA) data layer. The PCA was developed in 2008 to combine several existing GIS conservation priority datasets, including the VA Dept. of Game and Inland Fisheries' Priority Wildlife Diversity Conservation Areas; VA Dept. of Conservation and Recreation Division of Natural Heritage Conservation Sites Layer (CSL) and Natural Lands Network (NLN); and VCU Center for Environmental Studies Aquatic Resource Integrity Layer (NOAA grant FY08 NAO8NOS4190466, Task 11.02). In 2010, these same state partners were joined by DCR-Division of Soil and Water and Virginia Institute of Marine Science-Center for Coastal Resources Management to update and enhance the PCA. This consisted of updates to datasets previously included in the PCA, the inclusion of VIMS' Aquatic Priority Conservation Areas layer, and the inclusion of Virginia's Healthy Watersheds data, as identified by VCU-Center for Environmental Studies.

Coastal VEVA synthesizes important natural resource information in one geospatial layer for guiding conservation planning, natural resource management, land use management and public awareness of the general ecological values of areas throughout the Coastal Zone. This dataset is not intended to replace on the ground surveys or consultation with biologists as appropriate, but is intended to be a thorough first step to enable efficient consideration of natural resources and ecosystem function early in any planning process. These data do not constitute official legal or technical advice.

This project was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through grant number NA10NOS4190205 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management act of 1972, as amended.

How to get the data layer

[Download](#) it at VA DGIF's GIS site.

Or view it at [Virginia DEQ Coastal GEMS](#).

How you might make use of this data layer

Coastal VEVA is a generalized geospatial dataset intended to guide initial conservation planning or blue-green infrastructure efforts. All areas within the VEVA are important; the 1-5 values are subjective rankings based on expert opinions and the best available information. It is recommended that priority be given to sites with the highest ecological value in consultation with a biologist. The data can be used in the planning process to identify areas that could be considered for open natural space value, recognize parcels that may be zoned for conservation, find areas for potential easements, distinguish areas that would benefit most from low impact development measures, or pinpoint areas where additional development can be focused, so that areas that can be conserved or strategically zoned in a compatible use to preserve ecological integrity. Users should also consider protection and management of entire watersheds, as impacts to headwaters areas have cumulative effects on downstream priority features such as rivers and wetlands.

Local data not included in the VEVA data layer can be added and used to adjust the value of specific entities' interests where appropriate. The Analysis Toolset in ArcGIS provides a variety of overlay tools that can be used to add data to the VEVA data layer and then use those local data to refine the rankings of lands and waters in the VEVA layer. Since the VEVA includes both green infrastructure (e.g. terrestrial biodiversity, wildlife diversity) and blue infrastructure values (e.g. Healthy Watersheds, ecologically valuable estuarine resource areas), the VEVA output map allows one to begin to visualize the benefits of comprehensive conservation planning in one place.

How to get more information

Visit the Virginia CZM [Blue Green Infrastructure Mapping and Planning Efforts site](#).

Or view the layer's [formal metadata](#).

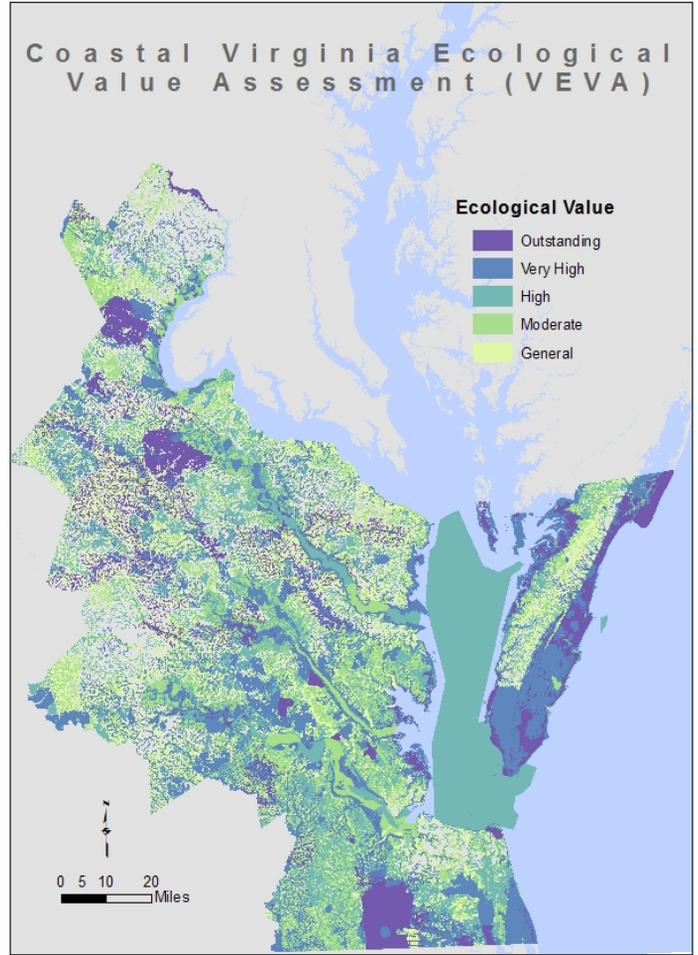
Sample Map



Copyright © 2012 NatureServe. All Rights Reserved.
© Bruce McNitt/Panoramic Images (Virginia)

Coastal Virginia Ecological Value Assessment (VEVA)

The Coastal Virginia Ecological Value Assessment (VEVA) was developed to provide guidance to local governments engaged in land use management and conservation planning. VEVA is a collaborative effort among several state programs to synthesize the best available natural resource information into a single geospatial product. VEVA combines scientific data and best professional judgment to rank terrestrial and aquatic areas for their ecological value. These values can be used to prioritize areas for preservation, develop strategies for special area management actions, or to build awareness about Virginia's natural communities.



For more information visit these websites:

<http://www.deq.state.va.us/coastal/coastalgems.html>

http://ccrm.vims.edu/resources/conservation_planning/index.html

<http://www.dgif.virginia.gov/gis/gis-data.asp>

Data Sources

Priority Wildlife Diversity Conservation AreasVA Dept. of Game and Inland Fisheries
Natural Heritage Conservation Sites LayerVA Dept. of Conservation and Recreation, Natural Heritage
Natural Lands NetworkVA Dept. of Conservation and Recreation, Natural Heritage
Aquatic Resource Integrity LayerVCU Center for Environmental Studies
Aquatic Priority Conservation AreasVIMS Center for Coastal Resources Management
Virginia's Healthy WatersVA Dept. of Environmental Quality

Project Partners

This project was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through grant number NA10NOS4190205 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.



Virginia Coastal Zone
MANAGEMENT PROGRAM

75



Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

