Natural Heritage – Locality Liaison/Habitat Restoration

Final Report for FY2019 VCZMP Grant No. NA19NOS4190163 Task #5

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Virginia Department of Conservation and Recreation –
Division of Natural Heritage

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Executive Summary

During the FY2019 grant year, the Department of Conservation and Recreation-Division of Natural Heritage (DCR-DNH) reviewed 1,227 projects for impacts to natural heritage resources in the coastal zone (39% of the projects reviewed statewide) as defined by the Department of Environmental Quality (DEQ) Coastal Zone Management (CZM) Program. 37 of the projects reviewed in the coastal zone were solar projects, representing a continuing trend of solar development in Virginia. Specific project highlights within this report include a solar facility in Chesterfield County, an alternatives analysis for new transmission lines spanning multiple coastal counties, a highway improvement plan in Fairfax County, a new water pipeline force main in Isle of Wight County and Surry County, and a Federal Emergency Management Agency (FEMA) Floodplain Species Assessment in Gloucester County and James City County.

Coastal localities and other conservation partners participated in 11 training sessions for the Natural Heritage Data Explorer (NHDE) website (https://vanhde.org) including 18 from state agencies, 2 from local governments, 11 from consulting companies, 4 from land trusts, and 6 from federal agencies. At the end of FY2019, there were 42 coastal localities, 8 Planning District Commissions, and 16 land trusts within the coastal zone with access to NHDE, digital shapefile data, and/or a combination of these tools. This equates to 96% of coastal zone counties or cities having Natural Heritage data, 100% of the Planning District Commissions, and 52% of the Land Trusts as of September 30, 2019.

Presentations included an overview of DCR-DNH's Natural Heritage Program, the Locality Assistance Program and data and functionality of the Natural Heritage Data Explorer (NHDE) website, which includes ConserveVirginia v2.0, the Predicted Suitable Habitat Summary layers and ConservationVision models. Additional information was provided about the Virginia Wetlands Catalog and the Coastal Virginia Ecological Value Assessment (VEVA), part of DEQ's Coastal GEMS website application. Natural Heritage information was updated quarterly on the NHDE website and shapefiles including the updated information were also distributed to licensed users. During FY2019, 651 coastal projects were submitted through the NHDE, 53% of all the projects submitted for review in the coastal zone.

The Natural Heritage Locality Liaison (Locality Liaison) attended the Vertical Land Motion in The Chesapeake Bay Workshop in February 2020, the Virginia United Land Trust (VaULT) Virtual Land Conservation & Greenways Conference in August 2020, and the Environmental Assessment Scoping Update for the Ronald Reagan Washington National Airport Roadways New Development project in August 2020.

The Locality Liaison and project review staff renewed or initiated 56 data licenses throughout this year within the coastal zone, including localities, consultants, land trusts, state agencies, and federal agencies. The Locality Liaison also posted quarterly coastal species highlights to the Local Assistance webpage (http://www.dcr.virginia.gov/natural-heritage/localityliaison) and the locality map (http://www.dcr.virginia.gov/natural-heritage/localitiesmap) was updated identifying localities with natural heritage data.

Introduction

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 Natural Heritage 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.

The Virginia CZM Program and the Chesapeake Bay Program have developed flood risk management and climate change initiatives generating interest in land use issues within the coastal zone defined by the DEQ CZM. In addition, the Bay Total Maximum Daily Load (TMDL) program has encouraged 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 improve water quality and develop long-range planning for local resiliency. The Locality Liaison program continues to work to have natural heritage resources play a larger role in decision making in regards to the problems and opportunities they face in development and protecting their natural heritage resources.

Staffing

Tyler Meader serves as the Natural Heritage Locality Liaison (Locality Liaison) and reviews projects within the coastal zone with assistance from other environmental review staff. Rene' Hypes (Natural Heritage Environmental Review Coordinator) provides input for higher profile projects reviewed within the coastal zone. Numerous other DCR-DNH staff members also support the Locality Liaison program, including Information Data Management staff, Project Review Assistants, and various Natural Heritage biological inventory, protection, and stewardship 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 and provides oversight for the Project Review staff assisting in the review process. Barbara Gregory (Project Review Assistant, Senior) conducts reviews for the Virginia Department of Transportation (VDOT) projects statewide which during FY2019 included 124 transportation projects in the coastal zone. During this grant year, DCR-DNH reviewed a total of 1,227 projects in the coastal zone. This represents 39% of the projects reviewed statewide by DCR-DNH. 37 of the projects reviewed in the coastal zone were solar projects, representing a continuing trend of solar development in Virginia.

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, it has 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 wetland development projects against the DCR-DNH 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 the DCR-DNH database and the Virginia Department of Health (VDH) screens for issuance or re-issuance of pump-out facilities as part of their permitting process. The Virginia Marine Resource Commission (VMRC) relies on the DCR-DNH to review Joint Permit Applications (JPAs) for subaqueous bottomlands impacts and the DEQ Renewable Energy Program relies on DCR-DNH to review permit by rule applications for solar and wind energy projects for potential impacts to natural heritage resources. Virginia Soil and Water Conservation Districts, which coordinate local natural resource protection programs, rely on DCR-DNH for information to include in local agricultural conservation planning. The United States Fish and Wildlife Service (USFWS) also relies heavily on DCR-DNH data for their own regulatory responses including 5-year assessments of species listed under the federal Endangered Species Act. The USFWS Information, Planning, and Conservation (IPaC) System website on-line screening process includes DCR-DNH predicted suitable habitat models and references the Natural Heritage website for species coordination purposes. Additionally, DCR-DNH provides information on natural heritage resources to the Virginia Outdoors Foundation and Virginia land trusts as they work on developing conservation easements.

The DCR-DNH has a Memorandum of Agreement (MOA) with the Virginia Department of Wildlife Resources (VDWR) for sharing of data and species coordination between the two agencies. The DCR VDOT data exchange MOA was updated in February 2020 which outlines the integration of Natural Heritage data into their internal database for environmental screening purposes. Based on that internal screening process, projects needing further coordination are submitted by VDOT using the Natural Heritage Data Explorer. Also, under an MOA established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR-DNH represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

Specific Projects

Energy - Solar Project

Chester Solar-Chesterfield County

In August 2019, DCR-DNH first provided comments on a planned 120 MW solar facility in Chesterfield County. The planned solar facility is within the Chester Seeps Conservation Site,

and has the potential to negatively impact natural heritage resources. In addition, it would fragment over 100 acres of a C2 core, as well as potentially fragment C3 and C4 cores. DCR-DNH has been in consultation with the project proponent to provide further information about natural heritage resources at this site, and continues to work towards minimizing impacts to natural heritage resources.

DCR-DNH reviewed the Chester Solar project again in March 2020. This review prompted further coordination with the project proponent, an environmental consultant, and DCR-DNH staff, in an effort to identify ways to minimize impacts to natural heritage resources on the proposed project site. DCR-DNH plans to release locational data for natural heritage resources on the project site under a license agreement, so that these areas can be evaluated for protection. The ongoing collaboration is a positive example of balancing the needs for renewable energy with protection of natural heritage resources. The comment letter for this project can be found in Appendix A.

New Transmission Lines

Surry-Skiffes Creek-Whealton Alternatives Analysis - Charles City, Gloucester, Henrico, Isle of Wight, James City, Middlesex, New Kent, Surry, York

In February 2020, DCR-DNH provided comments on a route alternatives analysis for the construction of high voltage transmission lines. Some route alternatives would have included the construction of new transmission line rights-of-way (ROW), and others routes would primarily utilize existing ROW. Managed existing transmission line ROW can provide a habitat type that has been mostly lost in eastern Virginia and favors certain rare species that evolved with that habitat type. Due to this, if habitat conditions and management practices are suitable, specific natural heritage resources can be found in these transmission line ROW. DCR-DNH provided comments on the natural heritage resources which occurred within the project area and recommended a survey for known and/or potential occurrences of Mabee's salamander (*Ambystoma mabeei*, G4/S1S2/NL/LT), Tiger salamander (*Ambystoma tigrinum*, G5/S1/NL/LE), coastal plain depression wetland natural communities, Eastern big-eared bat (*Corynorhinus rafinesquii macrotis*, G3G4T3/S2/NL/LE), Canebrake rattlesnake *(Crotalus horridus*, G4/S1/NL/LE), and many rare plants species. DCR-DNH also commented on the potential fragmentation of Ecological Cores by permanent forest removal, and recommended the development of an invasive species management plan and ROW restoration and maintenance practices. The comment letter for this project can be found in Appendix B.

Highway Improvement Plan

I-495 and I-270 Managed Lanes Study - Fairfax

DCR-DNH provided comments to the Department of Environmental Quality on August 10, 2020 for the planned construction of new traffic lanes and associated infrastructure. While the majority of this project takes places in Maryland, the portion that impacts Virginia occurs with the Potomac Gorge Conservation Site, a site with an outstanding (B1) biodiversity rank. DCR-DNH has reviewed this project several times since the original submittal in April 2018, and continues to provide comments as the project footprint changes. The comments have highlighted the rare

plants and natural communities that occur within the project site, as well as several rare plants which have historically been documented in the project area. DCR-DNH has recommended limiting the project footprint as much as possible as well as recommending a survey for additional occurrences of natural heritage resources in areas proposed for disturbance, including the Northern Virginia Well amphipod (*Stygobromus phreaticus*, G1/S1/SOC/NL). DCR-DNH has received a summary of rare, threatened and endangered (RTE) plant species surveys conducted thus far in the Potomac River Gorge area by Maryland Department of Transportation-State Highway Administration, and looks forward to reviewing the full report on the survey findings and further coordination. The comment letter for this project can be found in Appendix C.

Water Pipeline Force Main

Surry Hydraulic Improvements and Interceptor Force Main Project-Isle of Wight, Surry

In February 2020, DCR-DNH provided comments and maps depicting natural heritage resources and conservation sites to an environmental consultant for the construction of approximately 18 miles of a new force main to redirect flows for the Surry County Treatment Plant. Eight conservation sites were intersected by the project footprint, along with an occurrence of Tall yellow-eyed grass (*Xyris platylepis*, G5/S2/NL/NL) not contained within a conservation site. DCR-DNH recommended avoidance of the conservation sites, and if avoidance was not possible, DCR recommended an inventory for the rare plant resources within the conservation sites and the documented occurrence of Tall yellow-eyed grass to re-confirm the location of these natural heritage resources. The project proponent planned to use directional drilling to avoid impacts to conservation sites, and DCR-DNH commented on the potential for directional drilling to potentially adversely impacts specific adjoining conservation sites and associated resources. DCR-DNH also recommended the development and implementation of an emergency spill plan, the use of best management practices for hydrostatic testing and dewatering, and the development of an invasive species plan. The comment letter for this project can be found in Appendix D.

Habitat Protection

FEMA Floodplain Species Assessment – James City County, Gloucester County

From August to September, 2020, DCR-DNH participated in the creation of a Federal Emergency Management Agency (FEMA) Floodplain Species Assessment Level 2 (FSA), led by James City County, Gloucester County, and an environmental consultant. The FSA is a necessary part of a Community Rating System (CRS) new pilot element to encourage local efforts at conservation and recovery of threatened and endangered species and critical habitats. The CRS, administered by the FEMA, is a voluntary program that recognizes activities implemented by communities to save lives, prevent and reduce property damage due to floods, and protect natural floodplain functions. Two of the species selected for the FSA were Small whorled pogonia (*Isotria medeoloides*, G2/S2/LT/LE) and Sensitive joint vetch (*Aeschynomene virginica*, G2/S2/LT/LT). During a conference call with the counties and the contractor for the pilot evaluation, DCR-DNH provided information about DCR-DNH data that could help inform the FSA and future protection efforts, including up-to-date predicted suitable habitat modeling

and conservation sites built around documented occurrences for the two species. Pages from the final draft of this document can be found in Appendix E.

Potential Conservation Easement Review-New Kent County

In October 2019, DCR-DNH provided comments on a potential conservation easement in New Kent County. Potential conservation easements are reviewed regularly to determine if natural heritage resources have been documented in the project area, or if the potential exists for natural heritage resources to occur if suitable habitat is present. DCR-DNH provides recommendations for the protection of documented resources, and recommends a survey if potential suitable habitat is present for additional resources at the landowner's discretion. The conservation easement in New Kent County bordered the Chickahominy River-Shipyard Creek-Diascund Creek Stream Conservation Unit (SCU). Comments on the SCU and associated rare plants were provided to the project proponent, along with recommendations to preserve water quality through the use of riparian buffers. The comment letter for this project can be found in Appendix F.

Natural Heritage Data and Natural Heritage Data Explorer

The heart of DCR-DNH's service to localities is the set of databases and information tools that indicate what is rare, where the rarities are, and how they can be protected. As of September 30, 2020, DCR-DNH databases contain information about approximately 10,105 specific occurrences of natural heritage resources**,** 2,544 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. Conservation sites are the primary mechanism for distributing natural heritage location information for public use. Conservation sites identify areas that potentially warrant conservation action because of the associated natural heritage resources and the habitat required for their survival. DCR-DNH currently tracks over 2,190 conservation sites, of which 663 are in the coastal zone. These sites are continuously being updated by DCR-DNH staff.

The Virginia Natural Heritage Data Explorer (NHDE) allows Internet users to access Natural Heritage data on a remote website. This ArcServer GIS informational tool last updated in October of 2020 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. In addition, licensed users may submit projects for review through the website. The natural heritage data on the website is updated quarterly, as updates are released to subscribers for digital screening coverage shapefiles. NHDE was updated in June 2020 to include a new value and field for ranking conservation sites, part of a larger effort to identify Essential Conservation Sites (ECS). ECS are the subset of conservation sites that contain one or more "irreplaceable" or "critical" natural heritage resources. Irreplaceable element occurrences (EO's) are the only known viable representative of its element in the state, and Critical EO's are one of only two known viable representatives of its element in the state. The Documented Natural Heritage Screening layer denotes ECS status in the "Essential Conservation Site?" field with a YES or NO value, where YES indicates the presence of at least one irreplaceable or critical EO at that site.

The website includes the Species and Community Search function which allows users to search for a list of natural heritage resources by various filters including localities, coastal zone and planning district commissions. The Virginia ConservationVision models are also accessible through the website, which help target conservation efforts by guiding comprehensive planning.

Several different levels of NHDE access are available, from a public access level to a paid subscription with increasing information made available to different tier level users. The Natural Heritage Data Explorer website tool can be accessed at https://vanhde.org/.

The NHDE website also contains the ConserveVirginia layer and a Predicted Suitable Habitats Summary (PSHS) layer. The PSHS layer summarizes 165 individual species Predicted Suitable Habitat (PSH) layers into one layer, including species listed as threatened and endangered and globally rare species. An individual species PSH layer is a raster layer, which identifies areas most likely to have suitable habitat for that species. PSH layers were developed using known occurrences, a Species Distribution Model, and expert opinion.

The DCR-DNH project review process has changed to incorporate the PSHS layer. Projects boundaries are screened against the PSHS layer, and are now buffered by 100 feet instead of two miles for screening against documented natural heritage resource layers. Projects that intersect with the PSHS layer are further reviewed by inventory biologists to determine whether a survey is needed for the resource(s). The use of the PSHS has resulted in a more informed screening process and reduced the number of projects submitted to Natural Heritage by partners that are unlikely to impact natural heritage.

ConserveVirginia is Governor Ralph Northam's land conservation strategy and is based on a data driven process for identifying Virginia's highest priority lands for protection. Research and spatial analysis of many conservation values are summarized into seven categories and mapped as: Agriculture & Forestry, Natural Habitat & Ecosystem Diversity, Floodplains & Flooding Resilience, Cultural & Historic Preservation, Scenic Preservation, Protected Landscapes Resilience, and Water Quality Improvement. Conserve Virginia v2.0 was released in May 2020, and presented by the Governor on June 10, 2020 which included new cultural resource information as well as the new Water Quality Improvement layer. The "ConserveVirginia Map" is a summary of all seven category inputs and can be used as an initial screening to determine if a potential land protection project qualifies as a ConserveVirginia priority.

Prior to the shift to teleworking due to COVID, training sessions for the NHDE were held in-person on an every-other-month basis and occurred in Richmond utilizing the DEQ computer lab, and a one-on-one training took place at the King and Queen County Government Building on October 2, 2019. Beginning in March 2020, the Locality Liaison evaluated software to conduct virtual NHDE training due to safety restrictions concerning the pandemic. The first virtual NHDE training took place on April 2 and multiple individual follow-up trainings with participants were conducted, due to technical difficulties during the initial training. An additional one-on-one NHDE training occurred in August 2020 with an environmental consultant. NHDE training is provided by the project review staff, primarily the Locality Liaison. The general training sessions are open to all organizations, but may be divided into different training sessions

dependent on the number of participants and capacity of the training facilities. During this grant year, 11 separate training sessions for NHDE were held for coastal zone participants.

Approximately 2,025 projects have been submitted through NHDE during FY2019 with 651 occurring in the coastal zone. Improvements to internal project review efficiency have been achieved through enhanced database query functions including the tracking of predicted suitable habitat models intersects in project review tracking database, and working to increase the number of projects reviewed electronically through NHDE. During this grant year, 433 projects within the coastal zone were identified as "no comment" projects for natural heritage resources through the NHDE automated reporting system. This type of screening saves time for DCR-DNH staff and allows project proponents to move forward quickly without additional coordination with Natural Heritage.

Participants in Locality Liaison Presentations

Presentations included an overview of DCR-DNH's Natural Heritage Program, the Locality Assistance Program, and data and functionality of the Natural Heritage Data Explorer (NHDE) website, which includes ConserveVirginia, the PSHS layers, and ConservationVision models. Additional information was provided about the Virginia Wetlands Catalog and the Coastal Virginia Ecological Value Assessment (VEVA), part of DEQ's Coastal GEMS website application.

Coastal participants in the training sessions included 18 from state agencies, 2 from local governments, 11 from consulting companies, 4 from land trusts, and 6 from federal agencies. A list of the local government, state, agencies and consultants that participated in these training sessions can be found in Appendix H.

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. DCR-DNH reviewed 12 projects for localities within the coastal zone; this does not include projects submitted by consultants on behalf of localities. Positive working relationships with localities have led to the inclusion of language in comprehensive plans that provides additional consideration and protection of natural heritage resources. These positive relationships have also led to DCR-DNH's involvement during early planning stages of proposed projects, when recommendations to avoid and minimize impacts to natural heritage resources are often the most effective. The Locality Liaison continues to update contact information for locality staff as well as comprehensive plan update timelines (see Appendix K).

At the end of FY2019, there were 42 coastal localities, 8 Planning District Commissions, and 16 land trusts within the coastal zone with access to NHDE, digital shapefile data, and/or a combination of these tools. This equates to 96% of coastal zone counties or cities having Natural Heritage data, 100% of the Planning District Commissions and 52% of the Land Trusts as of September 30, 2019. The Locality Liaison updated the website map

(http://www.dcr.virginia.gov/natural-heritage/localitiesmap) to display localities with natural heritage data, reflecting the current status. Please see Appendix I for a map of the Virginia localities with Natural Heritage information. The Locality Liaison and project review staff renewed or initiated 56 data licenses throughout this year within the coastal zone, including localities, consultants, land trusts, state agencies, and federal agencies.

The Natural Heritage Locality Liaison (Locality Liaison) attended the Vertical Land Motion in The Chesapeake Bay Workshop in February 2020, the VaULT Virtual Land Conservation & Greenways Conference in August 2020, and the Environmental Assessment Scoping Update for the Ronald Reagan Washington National Airport Roadways New Development project in August 2020.

Habitat Restoration and Protection Initiatives

DCR State Parks Planning Review

Natural Heritage staff participated on an advisory committee for state parks to discuss their master planning efforts. DCR-DNH staff review the park's resource information to consider appropriate park development. This process has provided state park planners with natural heritage resource information early in the planning stages to prevent impacts to resources.

During this grant year, DCR-DNH reviewed proposed projects at First Landing State Park, York River State Park, Chippokes Plantation State Park, Widewater State Park, Westmoreland State Park, Gloucester State Park, and the future Machicomoco State Park. Information and recommendations were provided about documented occurrences of natural heritage resources and/or the potential for natural heritage resources within the parks to avoid impacts to these resources during development.

Virginia Aquatic Resources Trust Fund Interagency Review Team

The Corps-Norfolk District and DEQ chair the Virginia Aquatic Resources Trust Fund (VARTF) Interagency Review Team that reviews and approves wetland and stream mitigation projects. Once approved these projects serve as an acceptable form of compensatory mitigation (preservation, creation, and enhancement) for impacts to state waters, including wetlands, permitted under Virginia Water Protection individual and general permits. DCR-DNH environmental review coordinator is a member of the interagency review team reviewing proposed wetland mitigation projects in the coastal zone as well as the other parts of the state. Several wetland mitigation bank prospectus were reviewed this grant year including three coastal zone wetland mitigation bank projects.

Virginia Solar Pollinator Resource Tool

The Environmental Review Coordinator and other Heritage staff continued the work on the enhancement of the Virginia Solar Site Native Plant Finder and completed the other Pollinator-Smart Resources including the comprehensive manual in December 2019. In January 2020, the

Pollinator Smart Team certified the first Pollinator-Smart Solar Facility in VA at the Cople Elementary School in Westmoreland County, Virginia.

To increase awareness of the Virginia Pollinator Smart Program resources developed in 2019, the Environmental Review Coordinator and other Heritage staff participated in webinars with various partners including the Clean Energy States Alliance, the Sierra Club, and other partners. In addition, on April 1 the team presented a webinar entitled "Pollinator Friendly Landscapes for Solar and Beyond" to 261 participants due to the COVID-19 cancellation of the Environment VA Conference. On September 8, 2020 a virtual stakeholder meeting, targeting city and county governments and local boards was held. The presentation introduced the Virginia Pollinator-Smart Program and discussed the benefits of participation and ways it can be used to achieve local goals. Recordings for both of these presentations can be found on the Virginia Pollinator Smart webpage at https://www.dcr.virginia.gov/natural-heritage/pollinator-smart.Virginia Pollinator Smart resources, documents, and photos can be found in Appendix G.

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 such as the partnerships with James City County and Fairfax County. 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 through coordination with other Heritage regional and agency staff. The Locality 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.

The Locality Liaison will continue to reach out to localities in the coastal zone to update information for a current point of contact for each locality due to potential staffing changes. The Locality Liaison will provide assistance to localities in the development of ordinances or regulations necessitating the review of Natural Heritage information for certain projects, including renewable energy projects. Land trusts and new potential partners including Virginia Indian tribes will also be targeted that do not currently have access to natural heritage information.

Now that a reliable software platform for virtual NHDE trainings had been identified, NHDE training will continue to be available every other month to provide interested users with the ability to access natural heritage information. The virtual format should allow increased participation, as travel concerns will no longer be a concern for interested participants. The Locality Liaison will also schedule NHDE training for the public side of the website for interested individuals.

42 coastal zone localities with documented natural heritage resources currently have access to the NHDE or digital shapefile of Natural Heritage data. License agreements with localities are valid for a period of two years. During this grant period, the Locality Liaison has begun a process of ensuring that all of the license agreements with coastal localities are valid and up-to-date, and will continue to work to maintain updated license agreements.

The Locality Liaison web page will be updated and revised to continue to provide relevant natural heritage information for localities as well as updating the quarterly coastal species section (Appendix J) and the map of localities with Natural Heritage data. The Locality Liaison along with the project review staff will continue to work to improve the environmental review process.

Appendix A

Letter for Chester Solar Technology Park

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz
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Thomas L. Smith
Deputy Director of Operations

March 10, 2020

Julia Campus
Timmons Group
1001 Boulders Parkway, Suite 300
Richmond, VA 23225

Re: 43208, Chester Solar Technology Park

Dear Ms. Campus:

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 Chester Seeps Conservation Site is located 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. Chester Seeps 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:

Asclepias rubra	Red Milkweed	G4G5/S2/NL/NL
Carex vestita	Velvet sedge	G5/S2/NL/NL
Chelone cuthbertii	Cuthbert's Turtlehead	G3/S2/NL/NL
Kalmia angustifolia	Sheep laurel	G5/S2/NL/NL

Platanthera blephariglottis var. blephariglottis	Small white fringed orchid	G4G5T4T5/S2/NL/NL
Rhynchospora fascicularis	Fasciculate Beakrush	G5/S2/NL/NL
Sabatia difformis	Lance-leaved rose-gentian	G4G5/S1/NL/NL
Sarracenia purpurea	Purple pitcher plant	G5/S2/NL/NL
Tetragonotheca helianthoides	Squarehead	G5/S1/NL/NL

Due to the known occurrences of documented natural heritage resources and the potential for this site to support additional populations of natural heritage resources, DCR recommends an inventory for the resources in the study area. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss arrangements for field work.

Furthermore, DCR recommends the development of an invasive species management plan for the project and the planting of Virginia native pollinator plant species that bloom throughout the spring and summer, to maximize benefits to native pollinators. DCR recommends planting these species in at least the buffer areas of the planned facility, and optimally including other areas within the project site. Guidance on plant species can be found here: http://www.dcr.virginia.gov/natural-heritage/solar-site-native-plants-finder. In addition, Virginia native species alternatives to the non-native species listed in the Virginia Erosion and Sediment Control Handbook (Third Edition 1992), can be found in the 2017 addendum titled "Native versus Invasive Plant Species", here: https://www.deq.virginia.gov/Portals/0/DEQ/Water/Publications/NativeInvasiveFAQ.pdf. Page 3 of the addendum provides a list of native alternatives for non-natives commonly used for site stabilization including native cover crop species (i.e. Virginia wildrye).

In addition, the proposed project will fragment Ecological Cores C2, C3 and C4 as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection.

Ecological Cores are areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection and erosion prevention), and air quality (including carbon sequestration and oxygen production), along with the many associated economic benefits of these functions. The cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats of natural heritage resources they contain.

Fragmentation occurs when a large, contiguous block of natural cover is dissected by development, and other forms of permanent conversion, into one or more smaller patches. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation and egg parasitism, and increased invasion by weedy species.

Therefore minimizing fragmentation is a key mitigation measure that will reduce deleterious effects and preserve the natural patterns and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining fragments, retain natural corridors that allow

movement between fragments and designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns). Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

The proposed project will cause significant fragmentation of one or more highly significant cores with very high to outstanding ecological integrity. Further investigation of these fragmentation impacts is warranted and DCR-DNH can conduct a formal fragmentation analysis upon request. This analysis would estimate direct impacts to cores and habitat fragments and indirect impacts to cores. For more information, please coordinate with Joe Weber, Natural Heritage Information Manager at Joseph.Weber@dcr.virginia.gov.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the 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 re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of 120.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

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 Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dgif.virginia.gov.

Should you have any questions or concerns, please contact me at 804-225-2429. Thank you for the opportunity to comment on this project.

Sincerely,

Tyler Meader

Tyler Meader
Natural Heritage Locality Liaison

Cc: Mary Major, DEQ-Renewable Energy

Appendix B

Letter for Surry-Skiffes Creek-Whealton Alternatives Analysis

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz
Deputy Director of Administration and Finance

Russell W. Baxter
Deputy Director of Dam Safety & Floodplain Management and Soil & Water Conservation

Thomas L. Smith
Deputy Director of Operations

February 10, 2020

Julie Arrison
ERM, Inc.
300 West Summit Avenue. Suite 330
Charlotte, NC 28203

Re: Surry-Skiffes Creek-Whealton Alternatives Analysis

Dear Ms. Arrison:

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.

WHITTIER_HYBRID_ALTERNATIVE, MODIFIED_SCC_ALTERNATIVE_C, SURRY_TO_WHEALTON_500KV ALTERNATIVE

According to the information currently in our files, the Cat Ponds Conservation Site and the James River Bridge Conservation Site are located 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.

Cat Ponds Conservation Site has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resources of concern at this site are:

Ludwigia brevipes	Long Beach Seedbox	G2G3/S2/SOC/NL
Siren intermedia	Lesser Siren	G5/S2S3/NL/NL
Eleocharis melanocarpa	Black-fruited Spikerush	G4/S2/NL/NL
Deirochelys reticularia	Chicken Turtle	G5/S1/NL/LE
Utricularia purpurea	Purple Bladderwort	G5/S2/NL/NL
Sabatia difformis	Lance-leaved rose-gentian	G4G5/S1/NL/NL
Panicum hemitomon	Maidencane	G5?/S2/NL/NL
Sphagnum macrophyllum	Large-leaf Peatmoss	G3G5T3?/S2/NL/NL
Eleocharis tricostata	Three-angled spikerush	G4/S1/NL/NL
Ambystoma mabeei	Mabee's Salamander	G4/S1S2/NL/LT
Ambystoma tigrinum	Tiger Salamander	G5/S1/NL/LE
Hyla gratiosa	Barking Treefrog	G5/S1/NL/LT
Coastal Plain Seasonal Pond (Swamp Tupelo - Overcup Oak Type)		G1G2/ S1S2/NL/NL

The James River Bridge Conservation Site has been given a biodiversity significance ranking of B5, which represents a site of general biodiversity significance. The natural heritage resource of concern at this site is:

Falco peregrinus	Peregrine falcon	G4/S1B,S2N/NL/LT

The Peregrine falcon nests on cliffs, bluffs, talus slopes, old tree hollows, and abandoned nests of other birds of prey (Byrd, 1991). The adult Peregrine Falcon has long and pointed wings, a dark blue or slate back, black on its head and cheeks and white on its throat and sides of its neck. Their belly is barred white and blackish brown and its long, narrow tail is blue-grey with rounded narrow black bands and a white tipped end (Byrd, 1991). The Peregrine Falcon declined dramatically worldwide as a result of pesticide use in the mid-1900's and was once extirpated from east of the Mississippi, including Virginia (CCB, 2006). Once nesting took place in mountainous areas with shear cliffs (CCB, 2006); currently, nesting pairs in Virginia use artificial structures such as tall buildings, bridge supports, and towers primarily in the coastal plain (Byrd, 1991; CCB, 2006). Intensive reintroduction efforts have been applied in Virginia since the 1970s, and currently the population in Virginia still warrants protection and management. Threats to the Peregrine falcon include continued exposure to pesticides and human disruption of nesting attempts (Byrd, 1991). Please note that this species is currently classified as threatened by the Virginia Department of Game and Inland Fisheries (VDGIF).

To minimize adverse impacts to the documented natural heritage resources, DCR recommends avoidance of the conservation sites. Due to the legal status of Peregrine falcon, DCR also 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). DCR also recommends coordination with the Center for Conservation Biology (CCB) for information regarding recent nesting data, evaluation of potential impacts of construction activities on nesting falcons, and coordination on potential time-of-year restrictions for proposed construction activities.

In addition, the proposed project will fragment C3, C4 and C5 Ecological Cores as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection.

Ecological Cores are areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as

species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection and erosion prevention), and air quality (including carbon sequestration and oxygen production), along with the many associated economic benefits of these functions. The cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats of natural heritage resources they contain.

Fragmentation occurs when a large, contiguous block of natural cover is dissected by development, and other forms of permanent conversion, into one or more smaller patches. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation and egg parasitism, and increased invasion by weedy species.

Therefore minimizing fragmentation is a key mitigation measure that will reduce deleterious effects and preserve the natural patterns and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining fragments, retain natural corridors that allow movement between fragments and designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns). Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

TABORS_D ALTERNATIVE-East Line

According to the information currently in our files, the Ferry Creek upstream Rt. 198 Stream Conservation Unit (SCU) is located within the project site. 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 Ferry Creek upstream Rt. 198 SCU has been given a biodiversity ranking of B4, which represents a site of moderate significance. The natural heritage resource associated with this site is:

Aquatic Natural Community (NC-Great Wicomico-Piankatank First Order Stream)	G3/S3/NL/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, 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 a "Healthy" stream designation 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 (6^{th} 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. To minimize adverse impacts to the aquatic ecosystems 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.

In addition, the White Marsh Ponds Conservation Site is located within the project site. White Marsh Ponds Conservation Site has been given a biodiversity significance ranking of B5, which represents a site of general biodiversity significance. The natural heritage resource of concern at this site is:

Hyla gratiosa	Barking treefrog	G5/S1/NL/LT

The Barking treefrog ranges through the coastal plain from North Carolina to Florida and west to Mississippi and eastern Louisiana (NatureServe, 2009). There are disjunct populations in Delaware, Maryland, Kentucky and Tennessee, and southeastern Virginia (NatureServe, 2009). Across its range, it inhabits areas near shallow ponds in pine savannas and in low wet woods and swamps (Martof et al., 1980). In Virginia, this species breeds in fish-free vernal ponds (Pague & Young, 1991). When inactive during cold or dry seasons, they burrow under tree roots, vegetation, or in the soil; otherwise, this species is mostly arboreal and thus dependent on trees near the water (Pague & Young, 1991). Adult frogs feed on insects and other invertebrates; tadpoles consume primarily algae (VDGIF, 1993). Major threats to the Barking treefrog include continued logging of native pine, destruction of breeding ponds, and over collecting (Pague & Young, 1991). Please note that this species is currently classified as threatened by the VDGIF.

To minimize adverse impacts to the documented natural heritage resources, DCR recommends avoidance of the conservation site.

According to a DCR zoologist, there is also potential for Tiger salamander (*Ambystoma tigrinum*, G5/S1/NL/LE) and Mabee's salamander to occur within the isolated wetlands in the project area. In Virginia, Mabee's salamander inhabits isolated depression wetlands in pine woods, open fields, lowland deciduous forests (Behler and King, 1979), pine savannas, low wet woods and swamps (Martof et. al., 1980). They breed in fish-free vernal ponds (Pague & Mitchell, 1991) where the eggs are attached to submerged plant material or bottom debris (Behler and King, 1979). This species migrates up to a few hundred meters between their breeding and nonbreeding habitats, although, some adults will remain at the breeding site after the pond dries. Concurrent with heavy winter and springs rains, mass movements of adults to the breeding ponds have been documented (TNC et. al., 1999). Adults and juveniles spend most of the year underground in the upland habitats, but return to the ponds to breed in February or March (VDGIF, 1994). Because of the amphibious life cycle, the presence of sufficient, suitable terrestrial and aquatic habitat is critical (VDGIF, 1994).

Threats to Mabee's salamander include habitat loss, habitat fragmentation, and habitat contamination (VDGIF, 1994). The wetland habitats can be degraded or destroyed by filling, draining, ditching, and changing land use in the groundwater recharge zones or by contamination with pesticides or other chemicals. The upland habitats can be compromised by residential, commercial and industrial development, incompatible forest management practices, and other changes. Loss of suitable continuous terrestrial habitat between breeding sites may fragment populations and lead to extirpation through such factors as environmental perturbations, disease, and inbreeding (VDGIF, 1994). Please note that this species is currently classified as threatened by the VDGIF.

The Tiger salamander ranges across much of the United States, extending northward into Canada, and south into Mexico (Petranka, 1998). Populations in Virginia are limited to primarily the Coastal Plain, with disjunct populations in the Ridge and Valley physiographic region (Pague and Buhlmann, 1991). Of six documented records in Virginia, only three are currently thought to be viable. The terrestrial habitat of the tiger salamander has been described as sandy areas near shallow ponds chiefly in pine savannahs (Martof, et al., 1980). In general, tiger salamanders require soils in which it can burrow near suitable breeding ponds. On the Coastal Plain, fish-free vernal pools often provide breeding habitat for the tiger salamander. In the Ridge and Valley, limestone sinkhole ponds are utilized.

Similar to other salamanders in this genus, the tiger salamander may migrate up to a few hundred meters between their breeding and non-breeding habitats, although, some adults will remain at the breeding site after the pond dries (Pague and Buhlmann, 1991). Concurrent with heavy winter and springs rains, mass movements of adults to the breeding ponds have been documented. Adults and juveniles spend most of the year underground in the upland habitats, but return to the ponds to breed in February or March (Pague and Buhlmann, 1991). Because of the amphibious life cycle, the presence of sufficient, suitable terrestrial and aquatic habitat is critical.

Populations in the southeastern United States appear to be declining as a result of deforestation and loss of wetland habitats (NatureServe, 2009). The major threats to this species in Virginia include draining of crucial breeding habitat, fish stocking, and succession (Pague & Buhlman, 1991). Please note that this species is currently classified as endangered by the VDGIF.

According to a DCR ecologist, there are several coastal plain depression wetlands (see Figure 1) within the right-of-way that may qualify as significant natural communities tracked by DCR. Due to the potential for these sites to support additional populations of natural heritage resources, DCR recommends an inventory for the resources in the study area. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss arrangements for field work.

Due to the legal status of the Barking treefrog, DCR also 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).

In addition, the proposed project will fragment C2, C3, C4 and C5 Ecological Cores as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection.

TABORS_D ALTERNATIVE-West Line

According to a DCR zoologist, there is potential for the Eastern big-eared bat (*Corynorhinus rafinesquii macrotis*, G3G4T3/S2/NL/LE) to occur in the project area if suitable habitat exists on site. The Eastern big-eared bat is named for its enormous ears twice the length of its head, is extremely rare in Virginia and is currently known only from the southeastern portion of the state. Although widespread throughout the southeast, they are never found in large numbers. These bats roost singly or in small groups in hollow trees or abandoned buildings. They forage only after dark primarily in mature forests of both upland and lowland areas along permanent bodies of water (NatureServe, 2009). The details of this bat's feeding behavior and much of its natural history remain a mystery. Lack of information regarding the ecology of the Eastern big-eared bat, and their sensitivity to disturbance, make them particularly vulnerable to destruction of roost sites and feeding areas where their presence goes undetected (Handley and Schwab 1991, Harvey 1992).

Threats to this species include forest destruction, particularly hollow tree removal, decreasing availability of abandoned buildings, and possibly, insecticides. Please note that this species is currently classified as endangered by the VDGIF.

Due to the potential for this site to support populations of Eastern big-eared bat, if tree clearing is proposed DCR recommends an inventory for the resource in the study area including an assessment of potential roost trees that could be impacted. With the survey results we can more accurately evaluate

potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss arrangements for field work.

In addition, the proposed project will fragment C1, C2, C3, C4 and C5 Ecological Cores as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection.

SURRY_TO_WHEALTON_AS_BUILT ALTERNATIVE

According to the information currently in our files, the Grafton Ponds Conservation Site, the TABB Conservation Site, the Sandy Bottom Conservation Site and the Oyster Point ROW Conservation Site are located within the project area. 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.

Grafton Ponds 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:

Ardea alba	Great egret	G5/S2S3B,S3N/NL/NL
Chelone cuthbertii	Cuthbert turtlehead	G3/S2/NL/NL
Ambystoma mabeei	Mabee's salamander	G4/S1S2/NL/LT
Sabatia campanulata	Slender marsh pink	G5/S2/NL/NL
Fimbristylis perpusilla	Harper's fimbry	G2/S1/SOC/LE
Sphagnum macrophyllum var. macrophyllum	Large-leaf peatmoss	G3G5T3?/S2/NL/NL
Hypericum setosum	Hairy St. John's-wort	G4G5/S1S2/NL/NL
Calamovilfa brevipilis	Pine barren sandreed	G4/S1/NL/NL
Hyla gratiosa	Barking treefrog	G5/S1/NL/LT
Tillandsia usneoides	Spanish Moss	G5/S2/NL/NL
Litsea aestivalis	Pondspice	G3/S1/NL/NL
Ludwigia hirtella	Rafinesque's seedbox	G5/S2/NL/NL
Solidago latissimifolia	Elliot's goldenrod	G5/S2/NL/NL
Cleistesiopsis divaricata	Large spreading pogonia	G4/S1/NL/NL
	Colonial Wading bird Colony	G5/S2/NL/NL
Coastal Plain Seasonal Pond (Swamp Tupelo-Overcup Oak Type)		G1G2/S1S2/NL/NL
Coastal Plain Depression Swamp (Willow Oak-Red Maple-Sweetgum Type)		G3/S2/NL/NL
Coastal Plain Seasonal Pond (Slender Plumegrass Type)		G2G3/SU/NL/NL

Grafton Ponds is a complex of coastal plain sinkhole ponds and wetlands. The key natural heritage resource of Grafton Ponds is the coastal plain seasonal pond complex. This complex is an area, which encompasses a conglomeration of significant geologic features (the depressions), as well as a number of

rare natural community types that are associated with the depressions. These coastal plain sinkhole ponds are unique wetland types, formed over the course of thousands of years as lime beds within the Yorktown Formation were leached and dissolved by groundwater and overlying sediments slowly subsided. The hydrology is driven by ground and surface waters, with water typically present in the winter and spring, drawing down in the later spring and summer, and drying by the late summer and early fall. With the tremendous variety of hydrologic regimes, pond shapes and sizes, and plant life in and around the ponds, and considering the sheer numbers of ponds, this complex offers the parameters necessary to produce high biological diversity and ecological significance. Consequently, many rare and unique plant and animal species have been documented within this coastal plain sinkhole pond complex. This complex is the last remaining relatively undisturbed coastal plain sinkhole complex in Virginia.

The TABB Conservation Site has been given a biodiversity significance ranking of B5, which represents a site of general significance. The natural heritage resources of concern at this site are:

Crotalus horridus (Coastal Plain population)	Canebrake rattlesnake	G4/S1/NL/LE
Ambystoma mabeei	Mabee's salamander	G4/S1S2/NL/LT

Timber and Canebrake rattlesnakes are two forms of the same species (*Crotalus horridus*). The species is widespread throughout eastern United States ranging from New England to Minnesota and south to Florida and Texas. The forms differ in appearance and habitat distribution but share enough genetic similarities that they are the same species (NatureServe, 2009). The Timber rattlesnake is typically darker or yellow-ish (Gibbons and Dorcas, 2005). In Virginia, it is found in the piedmont and mountainous regions. The Canebrake rattlesnake is typically lighter in color, often pinkish, and is found in more coastal areas, including the northern limit of its range in the southeastern counties of the coastal plain of Virginia (Gibbons and Dorcas, 2005).

Canebrake rattlesnakes in Virginia inhabit hardwood and mixed hardwood-pine forests, cane thickets and the ridges and glades of swampy areas (Mitchell and Schwab, 1991). Canebrake rattlesnakes are generally terrestrial and feed on a variety of small animals including small mammals, birds, and amphibians (Mitchell & Schwab, 1991).

The primary threats to the Canebrake rattlesnake are the loss of habitat due to development activities and persecution by humans (Mitchell, 1994). Please note that the coastal plain populations of the Canebrake rattlesnake are currently classified as endangered by the VDGIF.

The Oyster Point ROW Conservation Site is located within the project site. The Oyster Point ROW Conservation Site has been given a biodiversity significance ranking of B4, which represents a site of moderate biodiversity significance. The natural heritage resources of concern at this site are:

Hypericum adpressum	Bog St. John's-wort	G3/S1/NL/NL
Hypericum denticulatum	Coppery St. John's-wort	G5/S1/NL/NL

Bog St. John's-wort is a globally rare perennial herb that inhabits boggy depressions (Weakley, in prep.). It has also been documented in such disturbed areas as powerline rights-of-way. In Virginia Bog St. John's-wort is only known from the coastal plain. Yellow, five-petaled flowers are produced in July to August, during which time surveys for this species should be conducted (Weakley, in prep.). As of 2014, 3 occurrences of this state rare plant were documented by the Virginia Natural Heritage program, 2 extant and 1 historic. Coppery St. John's-wort is a rare perennial herb that can be found in bogs, peaty clearings, and pond shores and flowers from July to September. As of 2020, this is the only extant occurrence documented by the Virginia Natural Heritage program for this species in Virginia.

Sandy Bottom Conservation Site has been given a biodiversity significance ranking of B2, which represents a site of very high significance. The natural heritage resource of concern at this site is the Canebrake rattlesnake.
To minimize adverse impacts to the documented natural heritage resources, DCR recommends avoidance of the conservation sites. Due to the potential for these sites to support additional populations of natural heritage resources, DCR recommends inventories for the following resources:

1) Rare plants documented within the power line right-of-way in the Southwest corner of the Grafton Ponds Conservation Site. The right-of-way already has seven known rare plant occurrences (*Fimbristylis perpusilla, Sabatia campanulata, Chelone cuthbertii, Calamovilfa brevipilis, Ludwigia hirtella, Solidago latissimifolia, and Cleistesiopsis divaricata*) that should be re-inventoried to determine current status and location before recommendations can be provided. Please note that Harper's fimbry (*Fimbristylis perpusilla*,G2/S1/SOC/LE) has been listed as endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

2) Mabee's salamander, Canebrake rattlesnake (habitat survey) and Barking treefrog in Grafton Ponds and the TABB Conservation Sites and Harwood's Mill Reservoir areas intersected by the project site, and Canebrake rattlesnake in the surrounding forested areas in the vicinity of Newmarket Creek and Sandy Bottom Conservation Site adjacent to the project area.

With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources. DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss arrangements for field work.

Due to the legal status of the Barking treefrog, Canebrake rattlesnake and Mabee's salamander, 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**)**.

Please note this project is within a section of James River that has been designated as a scenic river in the state of Virginia. Due to this designation, DCR recommends you contact Lynn Crump of the DCR-Division of Planning and Recreational Resources at 804-786-5054 or Lynn.Crump@dcr.virginia.gov.

CHICKAHOMINY_TO_WHEALTON ALTERNATIVE
According to the information currently in our files, the Chickahominy River – Shipyard Creek – Diascund Creek Stream Conservation Unit (SCU) and the Gordon Creek SCU are located within the project site.

The Chickahominy River – Shipyard Creek – Diascund Creek SCU has been given a biodiversity ranking of B2, which represents a site of very high significance. The natural heritage resources associated with this site are:

Bacopa innominata	Tropical water-hyssop	G3G5/S2/NL/NL
Eriocaulon parkeri	Parker's pipewort	G3/S2/NL/NL
Isoetes hyemalis	Winter quillwort	G2G3/S2/SOC/NL
Nuphar sagittifolia	Narrow-leaved spatterdock	G5T2/S1/SOC/LT
Cabomba caroliniana	Carolina fanwort	G3G5/S1S2/NL/NL
Regina rigida	Glossy Crayfish snake	G5/S1/NL/NL
	Aquatic Natural Community (NC-Lower James Fourth Order Stream)	G2?/S2?/NL/NL

The Gordon Creek 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 (NC-Lower James Third Order Stream) G2G3/S2S3/NL/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. This stream reach holds a "Healthy" stream designation 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 (6^{th} 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. To minimize adverse impacts to the aquatic ecosystems 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.

In addition, the Hogneck-Yarmouth-Gordon Creeks Conservation Site and the Grove Creek Conservation Site are located within the project site. The Hogneck-Yarmouth-Gordon Creeks Conservation Site has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resources of concern at this site are:

Tidal Freshwater Marsh (Wild Rice - Mixed Forbs Type) G4?/S4?/NL/NL

The Tidal Freshwater Marsh (Wild Rice - Mixed Forbs Type) is characterized by tall herbaceous vegetation that occurs in freshwater to slightly oligohaline zones of tidal rivers along the north and mid-Atlantic coast of North America. In Virginia, these marshes occur in the upper portion of estuarine river systems, in fresh to slightly brackish areas along flats that are exposed at low tides. It is most extensive on sediments deposited by large meanders of the Pamunkey and Mattaponi Rivers, although outstanding examples also occur along the Potomac, Rappahannock, Piankatank, Chickahominy, and James Rivers. Strictly speaking, freshwater conditions have salt concentrations < 0.5 ppt, but pulses of higher salinity may occur during spring tides or periods of unusually low river discharge. Soils are highly variable and are composed of varying amounts of silts, silty mucks, fine peat, to very coarse sands.

Wild rice (*Zizania aquatic*) is usually dominant, although only conspicuously so in mid to late summer, when it overtops early season vegetation. This community can be codominated by pickerelweed (*Pontederia cordata*), arrow arum (*Peltandra virginica*), halberdleaf tearthumb (*Persicaria arifolia*), dotted smartweed (*Persicaria punctata*), and/or beggartick species (*Bidens* spp.). Common associates are generally a mixture of freshwater and brackish species that include broadleaf arrowhead (*Sagittaria latifolia*), marsh seedbox (*Ludwigia palustris*), jewelweed (*Impatiens capensis*), rice cutgrass (*Leersia oryzoides*), tidalmarsh amaranth (*Amaranthus cannabinus*), rosemallow (*Hibiscus moscheutos*), hemlock waterparsnip (*Sium suave*), sweetflag (*Acorus americanus*), and river bulrush (*Schoenoplectus fluviatilis*). This vegetation provides an important food source for migratory birds. (NatureServe, 2012)

The Grove Creek Conservation Site has been given a biodiversity significance ranking of B2, which represents a site of very high significance. The natural heritage resource of concern at this site is:

Coastal Plain Calcareous Ravine Forest G2?/S2/NL/NL
(American Beech – Southern Sugar Maple – Chincapin Oak/Bloodroot Forest)

The Coastal Plain Calcareous Ravine Forest is a rich mesophytic to submesophytic forest in calcareous ravines that are found in the southeastern Virginia Coastal Plain and possibly the adjacent Piedmont. Typical sites are deep ravines, sheltered north- or east-facing slopes and adjacent low interfluves downcut into Tertiary shell deposits or lime sands, including the Pliocene marine shell deposits of the calcium-rich Yorktown Formation. Soils are usually weathered from these calcareous, shell-rich deposits. Many herbaceous species found in this association are either at or near their northern range limit or are disjunct from a primary range farther west. Some stands have been impacted by removal of more valuable timber species. In addition, timber harvest degrades this community by allowing additional light and aggressive growth of invasive alien plants which thrive in well-lit, calcareous situations, including Japanese honeysuckle. A few examples are protected in Colonial National Park, Virginia, but others (including the best examples) are highly threatened by timber removal and development. (NatureServe, 2014)

To minimize adverse impacts to the documented natural heritage resources, DCR recommends avoidance of the conservation sites. According to a DCR botanist, there is a potential for New Jersey rush (*Juncus caesariensis*, G2G3/S2/SOC/LT) to occur in the western end of the project site, potential for Sensitive Joint-vetch (*Aeschynomene virginica*, G2/S2/LT/LT) to occur at the crossing of the Chickahominy River, and potential for Small whorled pogonia (*Isotria medeoloides*, G2?/S2/LT/LE) and Virginia least trillium (*Trillium pusillum* var. *virginianum*, G3T2/S2/SOC/NL) to occur to the east of the Chickahominy crossing if suitable habitat exists on site.

Due to the potential for this site to support populations of natural heritage resources, DCR recommends an inventory for the resources in the study area. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss arrangements for field work. A list of other individuals who are qualified to conduct inventories may be obtained from the USFWS.

For potential impacts to natural heritage resources within the proposed project footprint of the CHICKAHOMINY_TO_WHEALTON alternative to the southeast of the Skiffes Creek switching station, please see comments from the SURRY_TO_WHEALTON_AS_BUILT alternative, pages 5-8.

In addition, the proposed project will fragment C1, C2, C3, C4 and C5 Ecological Cores as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection.

CHICKAHOMINY_LANEXA_WHEALTON_SOUTH ALTERNATIVE, CHICKAHOMINY_LANEXA_WHEALTON_NORTH ALTERNATIVE

According to the information currently in our files, the Chickahominy River – Shipyard Creek – Diascund Creek SCU is located within the project sites. The Chickahominy River – Shipyard Creek – Diascund Creek SCU has been given a biodiversity ranking of B2, which represents a site of very high significance. The natural heritage resources associated with this site are:

Bacopa innominata	Tropical water-hyssop	G3G5/S2/NL/NL
Eriocaulon parkeri	Parker's pipewort	G3/S2/NL/NL

Isoetes hyemalis	Winter quillwort	G2G3/S2/SOC/NL
Nuphar sagittifolia	Narrow-leaved spatterdock	G5T2/S1/SOC/LT
Cabomba caroliniana	Carolina fanwort	G3G5/S1S2/NL/NL
Regina rigida	Glossy Crayfish snake	G5/S1/NL/NL
Aquatic Natural Community (NC-Lower James Fourth Order Stream)		G2?/S2?/NL/NL

Please note, two occurrences of Narrow-leaved spatterdock occur directly within the project footprints. To avoid impacts to these resources, DCR recommends avoidance of tower construction within Diascund creek.

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.

In addition, the Grove Creek Conservation Site and the Nances Shop Bog Conservation Site are located within the project site. The Grove Creek Conservation Site has been given a biodiversity significance ranking of B2, which represents a site of very high significance. The natural heritage resource of concern at this site is:

Coastal Plain Calcareous Ravine Forest (American Beech – Southern Sugar Maple – Chincapin Oak/Bloodroot Forest)	G2?/S2/NL/NL

The Nances Shop Bog 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:

Juncus caesariensis	New Jersey Rush	G2G3/ S2/NL/LT

New Jersey rush is a sedge-like herb with a rough surface and narrow leaves that inhabits acidic hardwood swamps, seeps, swales or pond margins. These sites usually contain a persistent seepage of groundwater or perennially reliable flow (Ware, 1991). It has also been documented in seepages within such disturbed areas as powerline rights-of-way. New Jersey rush is restricted to isolated occurrences in the coastal plain of Virginia (TNC et. al., 1999). Threats to this plant include disruptions in its hydrological regime, such as draining or filling wetlands and flooding by beavers, invasions by competitors resulting from clear-cutting of the overstory (Ware, 1991) and succession of its habitat to woody vegetation (Nature Serve 2011). Surveys for New Jersey rush should be conducted during the fruiting period of this plant from August – October.

Please note that this species is listed as threatened by the Virginia Department of Agriculture and Consumer Services (VDACS). It is also classified as a species of concern by the United States Fish and Wildlife Service (USFWS); however, this designation has no official legal status.

To minimize adverse impacts to the documented natural heritage resources, DCR recommends avoidance of the conservation sites.

For potential impacts to natural heritage resources within the proposed project footprint of the CHICKAHOMINY_LANEXA_WHEALTON_SOUTH alternative and the CHICKAHOMINY_LANEXA_WHEALTON_NORTH alternative to the southeast of the Skiffes Creek switching station, please see comments from the SURRY_TO_WHEALTON_AS_BUILT alternative, pages 5-8.

In addition, the proposed project will fragment C2, C3, C4 and C5 Ecological Cores as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection.

ALL ROUTES

DCR recommends the development and implementation of an invasive species plan to be included as part of the maintenance practices for the right-of-way (ROW). The invasive species plan should include an invasive species inventory for the project area based on the current DCR Invasive Species List (http://www.dcr.virginia.gov/natural-heritage/document/nh-invasive-plant-list-2014.pdf) and methods for treating the invasives. DCR also recommends the ROW restoration and maintenance practices planned include appropriate revegetation using native species in a mix of grasses and forbs, robust monitoring and an adaptive management plan to provide guidance if initial revegetation efforts are unsuccessful or if invasive species outbreaks occur.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. Survey results should be coordinated with DCR-DNH and USFWS. Upon review of the results, if it is determined the species is present, and there is a likelihood of a negative impact on the species, DCR-DNH will recommend coordination with VDACS to ensure compliance with Virginia's Endangered Plant and Insect Species Act.

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 re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of $2000.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

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 Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dgif.virginia.gov.

Should you have any questions or concerns, please contact me at 804-225-2429. Thank you for the opportunity to comment on this project.

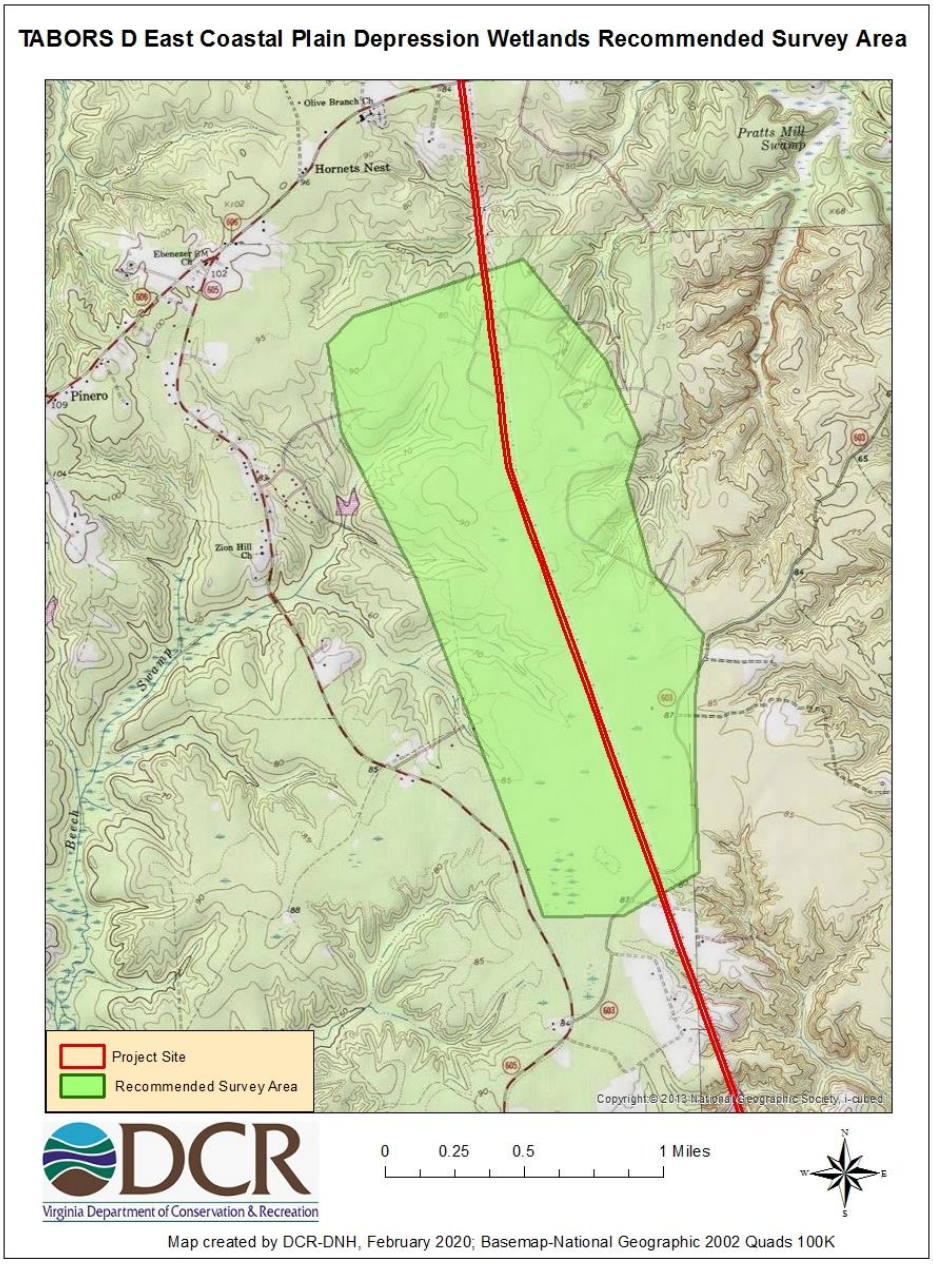
Sincerely,

Tyler Meader

Tyler Meader
Natural Heritage Locality Liaison

CC: Troy Andersen, USFWS
Amy Ewing, VDGIF
Lynn Crump, DCR-DPRR

Figure 1. Recommended Survey Area for Coastal Plain Depression Wetlands



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Appendix C

Letter for I-495 and I-270 Managed Lanes Study

Commonwealth of Virginia
Department of Conservation and Recreation
MEMORANDUM

To: Robbie Rhur, DCR-DPRR

From: Tyler Meader, DCR-DNH

Date: August 10, 2020

Subject: DEQ 20-103F, I-495 and I-270 Managed Lanes Study
Due: August 10, 2020

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 Potomac Gorge Conservation Site is located 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. The Potomac Gorge Conservation Site has been given a biodiversity significance ranking of B1, which represents a site of outstanding significance. The natural heritage resources of concern at this site are:

Maianthemum stellatum	Starry Solomon's-plume	G5/S1S2/NL/NL
Phacelia covillei	Coville's phacelia	G3/S1/NL/NL
Gomphus fraternus	Midland Clubtail	G5/S2/NL/NL
Boechera dentata	Short's rock cress	G5/S1/NL/NL
Silene nivea	Snowy Campion	G4?/S1/NL/NL
Central Appalachian / Piedmont Low-Elevation Rich Boulderfield Forest		G3G4/S2S3/NL/NL
Coastal Plain / Outer Piedmont Basic Mesic Forest		G4?/ S3/NL/NL

In addition, Tall Thistle (*Cirsium altissimum*, G5/S1/NL/NL), Wild cucumber (*Echinocystis lobata*, G5/SH/NL/NL), Smartweed Dodder (*Cuscuta polygonorum*, G5/S1/NL/NL), Northern rattlesnake-master (*Eryngium yuccifolium var. yuccifolium*, G5T5/S2/NL/NL), One-sided shinleaf (*Orthilia secunda*, G5/SH/NL/NL) and Pizzini's Amphipod (*Stygobromus pizzinii*, G3G4/S1S2/NL/NL) have been historically documented within the project site.

Furthermore, according to a DCR biologist, there is potential for the Northern Virginia Well amphipod (*Stygobromus phreaticus*, G1/S1/SOC/NL) and other *Stygobromus* amphipod species to occur within the project site.

DCR recommends avoidance of documented occurrences of natural heritage resources by limiting the

project footprint as much as possible including along the steep bluff on the eastern side in Virginia.

DCR has received the summary of rare, threatened and endangered (RTE) plant species surveys conducted thus far in the Potomac River Gorge area by Maryland Department of Transportation-State Highway Administration. DCR looks forward to reviewing the full report on the survey findings and further coordination as stated on page 4-116 of the Draft Environmental Impact Statement to minimize the impact to natural heritage resources.

Due to the potential for this site to support additional populations of natural heritage resources that are not included in an RTE plant survey, DCR recommends an inventory for these resources within areas proposed for disturbance including stormwater management ponds and equipment staging areas. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources. DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss arrangements for fieldwork.

In addition, the proposed project will fragment an Ecological Core C4 as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection.

Ecological Cores are areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection and erosion prevention), and air quality (including carbon sequestration and oxygen production), along with the many associated economic benefits of these functions. The cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats of natural heritage resources they contain.

Fragmentation occurs when a large, contiguous block of natural cover is dissected by development, and other forms of permanent conversion, into one or more smaller patches. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation and egg parasitism, and increased invasion by weedy species.

Therefore minimizing fragmentation is a key mitigation measure that will preserve the natural patterns and connectivity of habitats that are key components of biodiversity. The deleterious effects of fragmentation can be reduced by minimizing edge in remaining fragments; by retaining natural corridors that allow movement between fragments; and by designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns).

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 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 re-submit project information and

map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Wildlife Resources (VDWR) 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 https://vafwis.dgif.virginia.gov/fwis/ or contact Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dwr.virginia.gov.

Thank you for the opportunity to comment on this project.

Appendix D

Letter for Surry Hydraulic Improvements and Interceptor Force Main Project

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz
Deputy Director of Administration and Finance

Russell W. Baxter
Deputy Director of Dam Safety & Floodplain Management and Soil & Water Conservation

Thomas L. Smith
Deputy Director of Operations

February 21, 2020

Travis Comer
Rummel, Klepper & Kahl, LLP
11827 Canon Boulevard, Suite 402
Newport News, VA 23606

Re: 19002, Surry Hydraulic Improvements and Interceptor Force Main Project

Dear Mr. Comer:

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.

Runnymeade Quad
According to the information currently in our files, the Green Swamp Stream Conservation Unit (SCU) and the Mill Swamp-Golden Hill Branch SCU are located within the project site. 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 Green Swamp SCU has been given a biodiversity ranking of B4, which represents a site of moderate significance. The natural heritage resource associated with this site is:

Aquatic Natural Community (SC-Blackwater First Order Stream) G3/S3/NL/NL

The Mill Swamp-Golden Hill Branch SCU has been given a biodiversity ranking of B2, which represents a site of very high significance. The natural heritage resources associated with this site are:

Aquatic Natural Community (SC-Blackwater First Order Stream)
G2G3/S2S3/NL/NL
Aquatic Natural Community (SC-Blackwater Second Order Stream)
G2?/S2?/NL/NL

The documented Aquatic Natural Communities are 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 Communities are significant on multiple levels. First, these streams are a grade B and A- per the VCU-Center for Environmental Sciences (CES), indicating their relative regional significance, considering their aquatic community composition and the present-day conditions of other streams in the region. These stream reaches also hold "Healthy" stream designations per the INSTAR Virtual Stream Assessment (VSS) score. This score assesses the similarity of these streams to ideal stream conditions of biology and habitat for this region. Lastly, these streams contributes to high Biological Integrity at the watershed level (6^{th} 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 Communities and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal and introduction of non-native species.

Furthermore, the Golden Hill Branch Powerline Conservation Site, the Golden Hill Branch Conservation Site, the Mill Swamp Conservation Site and the Shrub Pocosin Powerline West Conservation Site are located 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.

Golden Hill Branch Powerline Conservation Site has been given a biodiversity significance ranking of B4, which represents a site of moderate significance. The natural heritage resource of concern at this site is:

Xyris platylepis	Tall yellow-eyed grass	G5/S2/NL/NL

Tall yellow-eyed-grass is state rare herb species that inhabits sandhill seeps, swamps, savannas and ditches (Weakley, in prep.). It has also been documented in such disturbed areas as powerline rights-of-ways (TNC, 1968). This plant blooms from July to September. As of 2014, 5 occurrences of this state rare plant were documented by the Virginia Natural Heritage Program, 1 historic and 4 extant.

The Golden Hill Branch Conservation Site and the Mill Swamp Conservation Site have been given a biodiversity significance ranking of B5, which represents sites of general biodiversity significance. The natural heritage resource of concern at these sites is:

Hyla gratiosa	Barking treefrog	G5/S1/NL/LT

The Barking treefrog ranges through the coastal plain from North Carolina to Florida and west to Mississippi and eastern Louisiana (NatureServe, 2009). There are disjunct populations in Delaware, Maryland, Kentucky and Tennessee, and southeastern Virginia (NatureServe, 2009). Across its range, it inhabits areas near shallow ponds in pine savannas and in low wet woods and swamps (Martof et al., 1980). In Virginia, this species breeds in fish-free vernal ponds (Pague & Young, 1991). When inactive during cold or dry seasons, they burrow under tree roots, vegetation, or in the soil; otherwise, this species is mostly arboreal and thus dependent on trees near the water (Pague & Young, 1991). Adult frogs feed on insects and other invertebrates; tadpoles consume primarily algae (VDGIF, 1993).

Major threats to the Barking treefrog include continued logging of native pine, destruction of breeding ponds, and over collecting (Pague & Young, 1991). Please note that this species is currently classified as threatened by the Virginia Department of Game and Inland Fisheries (VDGIF).

The Shrub Pocosin Powerline West Conservation Site has been given a biodiversity significance ranking of B5, which represents a site of general biodiversity significance. The natural heritage resource of concern at this site is:

Carex lupuliformis	False Hop Sedge	G4/S1S2/NL/NL

False hop sedge can be found in swamps, wet floodplain forests, and open swales and meadows (Killeffer, 1998) with seasonal flooding (TNC et al., 1999). This rare plant is threatened by alteration of hydrologic regimes and direct habitat destruction (TNC et al., 1999). False hop sedge blooms from June to July. It is currently known from nine locations in the coastal plain and eastern piedmont regions of Virginia, of which four occurrences are historic.

Bacons Castle Quad
The Rushmere Conservation Site and the Lawson Conservation Site are located within the project site, and have been given a biodiversity significance ranking of B5, which represents sites of general biodiversity significance. The natural heritage resource of concern at these sites is:

Hyla gratiosa	Barking treefrog	G5/S1/NL/LT

In addition, Tall yellow-eyed grass (*Xyris platylepis*, G5/S2/NL/NL) has been documented within the project site (Figure 1).

Smithfield Quad
According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

All Quads
Due to the occurrences of natural heritage resources within the project footprint, DCR recommends avoidance of the conservation sites and stream conservation units listed above. If avoidance of these conservation sites is not possible, DCR recommends an inventory for the rare plant resources within the conservation sites (Figure 2) and the documented occurrence of Tall yellow-eyed grass shown in Figure 1 to re-confirm the location of these natural heritage resources. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources, to include whether using directional drilling to avoid impacts to stream conservation units as mentioned in the project description may have the potential to adversely impact specific adjoining conservation sites and the associated natural heritage resources.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss arrangements for fieldwork.

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

In addition, DCR recommends the development and implementation of an emergency spill plan and the utilization of industry best management practices for hydrostatic testing and dewatering. DCR also recommends the development and implementation of an invasive species plan to be included as part of the maintenance practices for the right-of-way (ROW). The invasive species plan should include an invasive species inventory for the project area based on the current DCR Invasive Species List (http://www.dcr.virginia.gov/natural-heritage/document/nh-invasive-plant-list-2014.pdf) and methods for treating the invasives. DCR also recommends the ROW restoration and maintenance practices planned include appropriate revegetation using native species in a mix of grasses and forbs, robust monitoring and an adaptive management plan to provide guidance if initial revegetation efforts are unsuccessful or if invasive species outbreaks occur.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the 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 re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of $240.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

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 Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dgif.virginia.gov. A documented occurrence of a state listed animal in addition to the species listed above is located within the submitted project boundary including a 100-foot buffer. Therefore, DCR recommends coordination with the VDGIF, Virginia's regulatory authority for the management and protection of this species to ensure compliance with the Virginia Endangered Species Act **(**VA ST §§ 29.1-563 – 570).

Should you have any questions or concerns, please contact me at 804-225-2429. Thank you for the opportunity to comment on this project.

Sincerely,

Tyler Meader

Tyler Meader
Natural Heritage Locality Liaison

CC: Amy Ewing, VDGIF

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Figure 1. Occurrence of Natural Heritage Resource *Xyris platylepis (*Tall yellow-eyed grass)

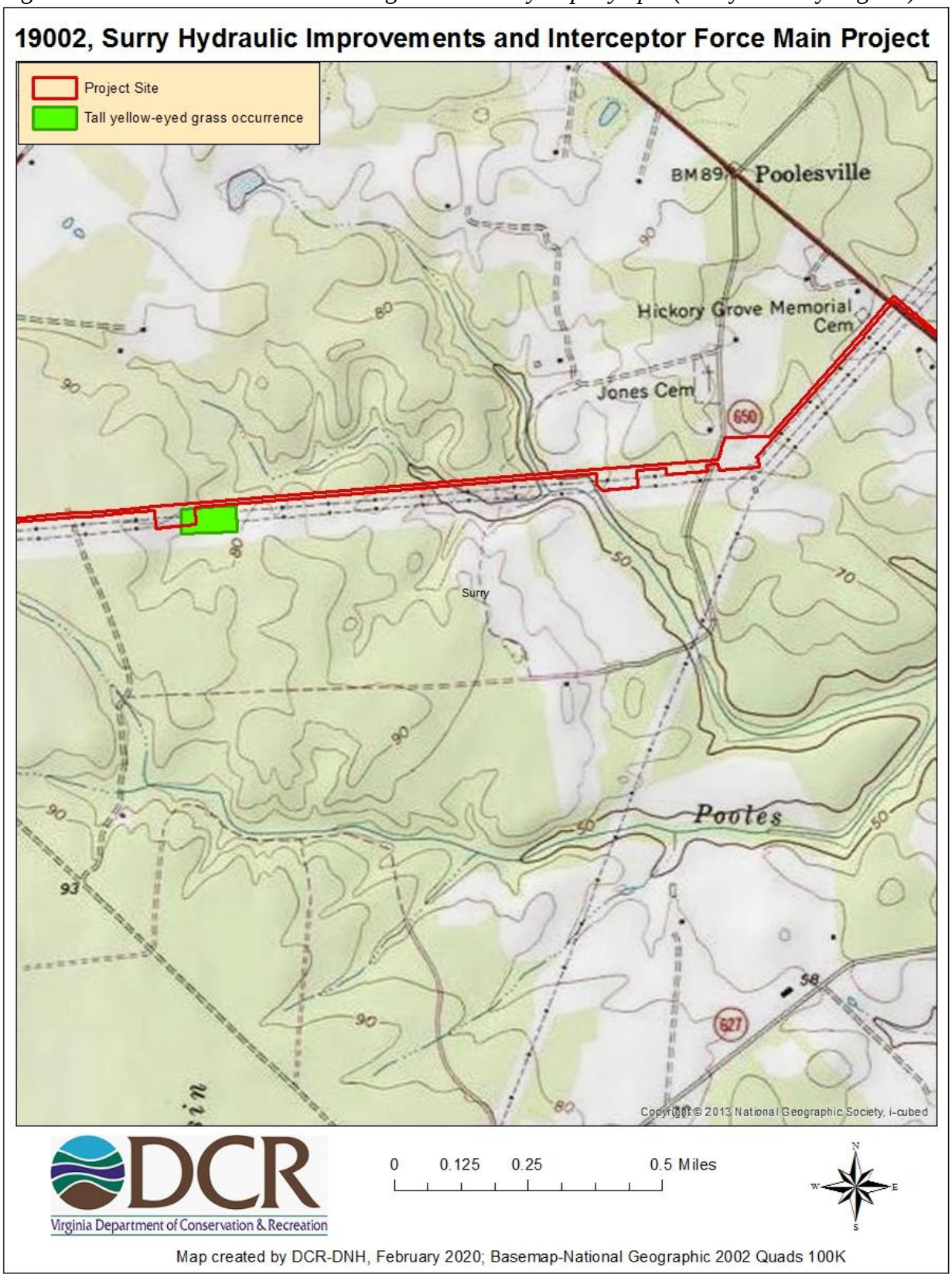
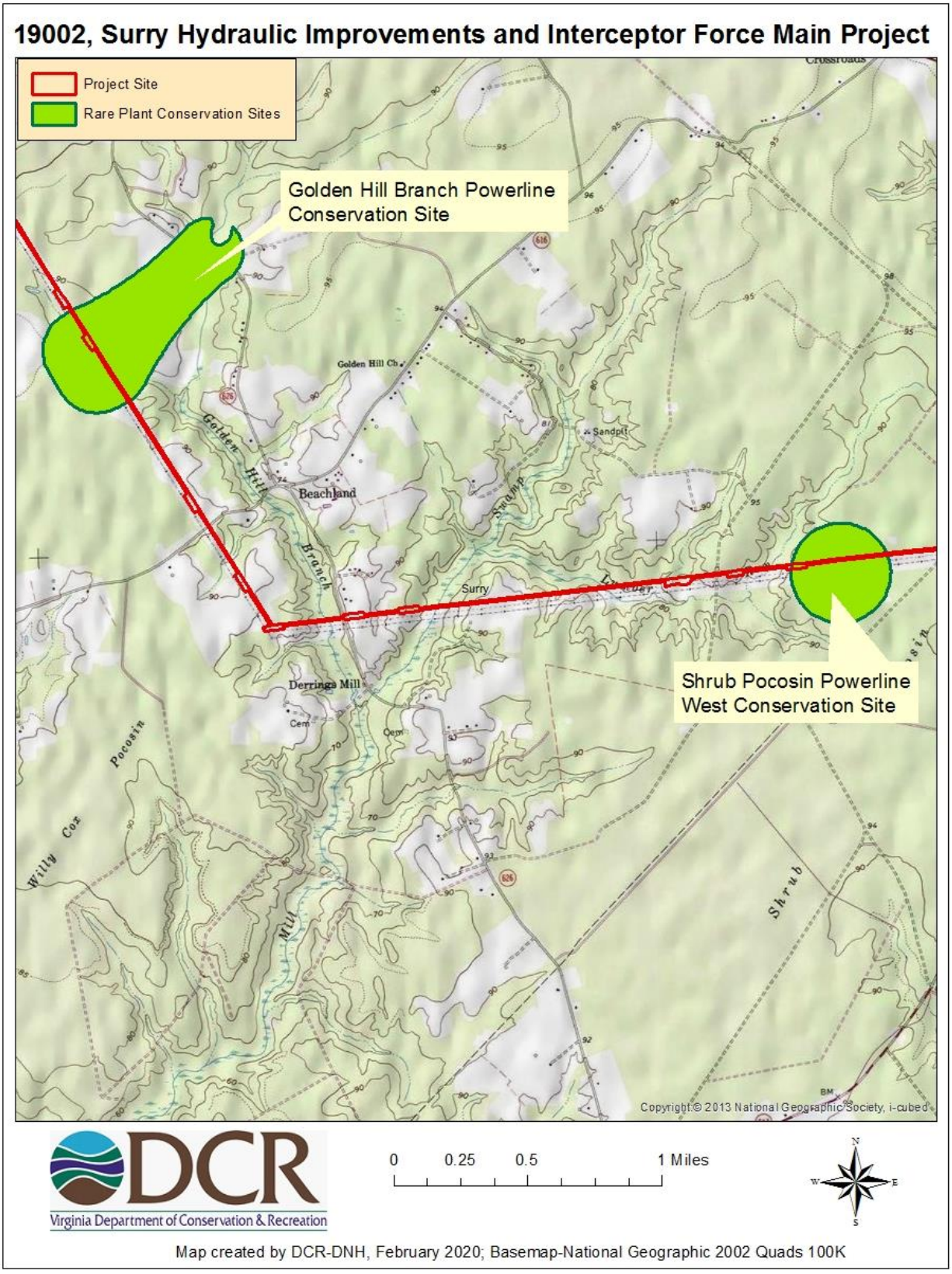


Figure 2. Conservation Sites Containing Rare Plant Natural Heritage Resources



Appendix E

Pages from Floodplain Species Assessment

US Fish & Wildlife Service, Virginia Field Office, Amarylis Irizarry. The prime concerns should be the small whorled pogonia and sensitive joint-vetch. They need floodplains and wetlands. Both are threatened with exotic plants and development in their areas.

Virginia Department of Conservation and Recreation, Division of Natural Heritage, Renee Hypes and Tyler Meader. The Division explained their current activities and how they can provide assistance to the Counties' programs, especially with technical data that can help prioritize areas for attention and protection and support permit review.

Wetlands Watch, Mary-Carson Stiff. Controlling development is very important for any species, especially in shoreline buffer areas that filter sediment and are more resistant to bank erosion. Public information messages would be more effective if they focused on the habitat instead of a particular species and if they showed how protecting certain species is good for the economy.

Federal Emergency Management Agency, Region III, Environmental and Historic Preservation Office. While FEMA participated on the call, staff received the notice too late to comment.

Both NMFS and Wetlands Watch recommended actions that address floodplain and aquatic habitat in general, rather than have similar actions fine tuned to specific species. The advisors provided more detailed recommendations and provided useful documents after the call. Their recommendations resulted in some changes to the previous pages and are incorporated into the rest of this document.

> ***Note:*** *A community can stop here, after identifying the threatened and endangered species, mapping their ranges and critical habitats, reviewing relevant CRS activities, and summarizing the feedback from the technical reviewers. What is done up to this point would qualify for CRS credit as a Floodplain Species Assessment (FSA). The rest of the pages in this document are what is need for a Floodplain Species Plan (FSP) credited by the CRS.*

Floodplain Species Plan

The following pages were developed based on the input from the above technical advisors and reviews of the referenced recovery plans. The advisors were sent a draft of the full plan and their comments have been incorporated into the rest of this document.

Selected Species

Two of the eight species were dropped from attention because they are not likely to be found in the counties – FWS' data bases do not show the Candy Darter or the Dwarf Wedgemussel to have range in either county. Both the Eastern Black Rail and the Northern Long-Eared Bat have a very large range mapped – covering many states.

While other listed species that don't currently have range in the counties were suggested, it was concluded that the species that would be most helped by a floodplain management program are the two plants and the two sturgeons. This section provides more information about them and the threats they face.

Small Whorled Pogonia

Small whorled pogonia

The small whorled pogonia is an orchid with a greenish-white stem that grows to between three and 13 inches tall. It gets its common name from the five or six grayish-green leaves that are displayed in a single whorl around the stem. When the leaves are well developed, a single flower or sometimes a pair rises from the center of the circle of leaves. The flowers are yellowish-green with a greenish-white lip.

Life cycle: The pogonia produces fruit that ripens in the fall. The thousands of dust-like seeds contain very little food reserves and therefore need to fall on soil containing fungi in order for the seed to germinate and seedlings to become established. Plants that are large one year are likely to bloom the next year, while plants that are small are more likely to be vegetative, go dormant, or die.

Habitat: Pogonia live in upland sites, in deciduous or deciduous-coniferous forests with a relatively open canopy. The soils in which it lives are usually acidic, moist, and have very few nutrients. As seen in Map 3, page 3, the pogonia's range is extensive in James City County and limited to the higher elevations of Gloucester County. Maps 5 and 7 also show a relatively small relation between the range and the mapped floodplain.

Threats: Habitat destruction is the primary threat to small-whorled pogonia. Commercial and residential development have encroached upon populations and eliminated what once was productive habitat.

Other threats include recreational use of hiking trails, off-road vehicles, slug damage, and grazing by mammals. Development has decreased the amount of available habitat for deer, concentrating their numbers, which in turn increases the concentration of deer that browse the plants. Small-whorled pogonia also appears to suffer from low rates of seedling establishment, meaning new plants do not replace older ones as they die.

Recovery measures: Given the primary threat, the primary measure would be requiring new developments to survey their lands to identify and avoid clusters of pogonias. Managing identified clusters would also help, but such work is not usually undertaken by a local government, unless it owns the land. A public information program to advise people of their appearance and what to do if they see one is also recommended in the Recovery Plan.

Sources: *FWS Southeast Region website; Small Whorled Pogonia Recovery Plan, First Revision*, FWS, 1992; "The Small Whorled Pogonia – A Recovering Endangered Species," FWS brochure, 1995; NatureServe Explorer website.

Sensitive Joint-Vetch

Sensitive joint-vetch

This plant is an annual that usually attains a height of three to six feet in a single growing season, but may grow as tall as eight feet. The flowers are yellow, streaked with red and the fruit is a pod, turning dark brown when ripe.

Life cycle: Germination takes place from late May to early June. Plants flower from July through September and occasionally into October. Fruits form shortly after the first signs of flowering in July. Seed maturation begins in August and continues through October. Seedlings grow quickly, approximately doubling in size every 2 weeks during the first 6 weeks.

Habitat: The Joint-Vetch occurs in fresh to slightly brackish tidal river systems, within the intertidal zone where populations are flooded twice daily. It typically occurs at the outer fringe of marshes or shores, where plant diversity is high and annual species are prevalent. It also can be found along rivers with new deposits of soil that have not yet been colonized by perennial species and in the estuarine meander zone of tidal rivers where sediments transported from upriver settle out and extensive marshes are formed.

Threats: The greatest threat to the sensitive joint-vetch has been habitat destruction. Many of the marshes where it occurred historically have been dredged and/or filled and the riverbanks stabilized with bulkheads or riprap. If water levels, tidal flow or salinity levels change, the species would be threatened at its existing sites. Rising sea levels and saltwater intrusion could further impact existing populations as the plant depends on open freshwater tidal habitat.

Other threats include sedimentation, competition from exotic plant species, recreational activities, agricultural activities, mining, runoff from upland development with associated pollution and sedimentation, impoundments, water withdrawal projects and introduced insect pests.

Recovery measures: "Three factors are key to conservation of sensitive joint-vetch: conservation of marsh sites in which it grows, protection of water quality and water levels, and upland buffer zones bordering these marshes." – VA Dept of Conservation and Development Fact Sheet. Local governments can regulate development and shoreline alteration in and near such areas, as well as the runoff into them. A program to inform property owners and the general public would also help.

Sources: *FWS Southeast Region website; Sensitive Joint-Vetch Recovery Plan*, FWS, 1992; *Sensitive Joint-Vetch 5-Year Review: Summary and Evaluation*, FWS, 2013; "Sensitive Joint-Vetch – A Threatened Species," FWS brochure, 1999; "Natural Heritage Resources Fact Sheet, Sensitive Joint-Vetch," Virginia Department of Conservation and Development, 1997.

Undeveloped parcels in the mapped ranges that are not preserved should also be identified so they become priorities for funding acquisition of more open space. A list of possible funding sources, their criteria, and their contacts would also be developed to facilitate seeking funding from Federal and state agencies and private organizations and foundations.

This action could also address areas of known clusters of small whorled pogonia and sensitive joint-vetch. They should be the top priority areas to be preserved through acquisition. However, this would have to be done carefully because such areas are often not publicized in order to deter rare species collectors who may want to harvest such sites.

Species: small whorled pogonia, sensitive joint-vetch

Threat addressed: loss of habitat

Lead office, Gloucester County: Engineering Services

Lead office, James City County: Stormwater and Resource Protection

Timetable: start within six months of the start of Phase 2. This will be an ongoing effort as funding opportunities arise.

Funding: Staff time for the review. Purchase of properties are dependent on the sites and outside sources of funding.

Supporting programs: County GIS staff, James City County's Purchase of Development Rights program, and organizations supporting preservation of open space, such as Wetland Watch, The Historic Virginia Land Conservancy, and the Department of Conservation and Recreation's Natural Heritage Program (box).

Natural Heritage Data

DCR-DNH has several resources that can help identify and prioritize conservation lands. These include:

- Lists of rare plants and animals and natural communities, which are updated as often as four times a year
- The Managed Conservation Lands Map, that delineates areas managed by public and private owners, and
- The Natural Heritage Data Explorer, a GIS application that provides access to the conservation status and conservation values of lands

CRS credit: Activity 420 (Open Space Preservation) open space preservation (OSP) and natural functions open space (NFOS)

Regulatory Review

7. **Open space incentives:** Undeveloped land not preserved as open space can be developed. There are ways to encourage owners and developers to set aside habitat or areas in the designated range of one or more species. These include tools like encouraging cluster development (currently in James City County's regulations), density transfers that give the developer the ability to build more houses in trade for dedicating the habitat to open space, or simply prohibiting construction in the floodplain if the parcel has room for development on high ground (also in James City County's regulations).

   This action calls for reviewing the current and possible incentives to see if the range and habitat of the four species are or could be considered as a factor for not developing certain

areas. This and the other regulatory reviews should also check whether they only impact large developments and recommend if they should apply to smaller ones.

Species: small whorled pogonia, sensitive joint-vetch

Threat addressed: loss of habitat

Lead office, Gloucester County: Engineering Services

Lead office, James City County: Community Development

Timetable: Conduct the review and ordinance drafting in coordination with the other regulatory review actions, which may take up to two years after the start of Phase 2.

Funding: Staff time

Supporting programs: organizations supporting preservation of open space

CRS credit: Activity 420 (Open Space Preservation) open space incentives (OSI)

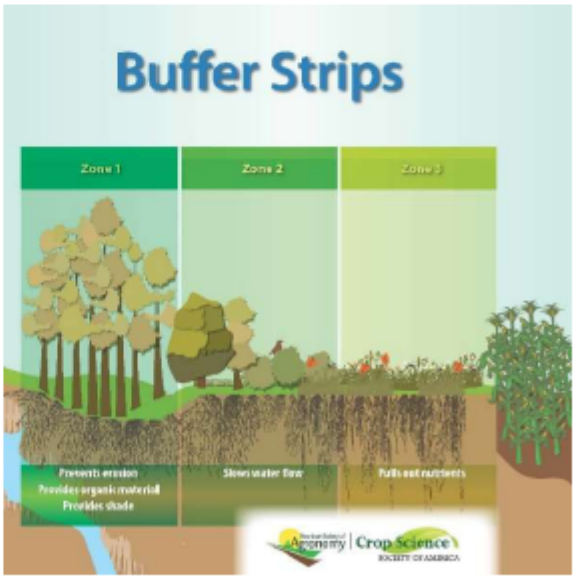
Revising Regulations

Certain regulations on land development are administered by the Virginia Department of Environmental Quality under the Virginia Stormwater Act. Virginia Code Section 62.1-44.15:33 makes it challenging for a local government to adopt a requirement more restrictive than the state regulations.

The community must document that the standard is "based upon factual findings of local or regional comprehensive watershed management studies or findings developed through the implementation of a MS4 permit or a locally adopted watershed management study and are determined by the locality to be necessary..." This requires more background and more work plus a mandate to seek approval that are not required for other ordinance amendments. Therefore, the timetables for Action Items 7 – 11 require up to two years to complete.

8. **Shoreline protection:** Shorelines are very important for both wetland plants and fish. Natural shorelines provide needed shade and are more effective than disturbed areas at resisting erosion and filtering sediment laden runoff.

   This action calls for reviewing the required 100-foot Resource Protection Area (RPA) natural buffer around all perennial streams. Do the rules adequately prevent development or ground alterations alongside stream shorelines? Should other set back rules be designated, similar to the example to the right?



This approach provides multiple benefits – preserving natural banks to minimize erosion, managing the amount of runoff, and filtering out pollutants and sediment.

Species: small whorled pogonia, sensitive joint-vetch, sturgeon

Threat addressed: sedimentation, loss of water quality, flow fluctuation

Lead office, Gloucester County: Engineering Services

Lead office, James City County: Stormwater and Resource Protection

Timetable: Conduct the review and ordinance drafting in coordination with the other regulatory review actions, which may take up to two years after the start of Phase 2.

Funding: Staff time

Supporting programs: organizations interested in environmental protection and fishing

CRS credit: Activity 420 (Open Space Preservation) natural shoreline protection (NSP)

This is one of a series of DCR-DNH brochures on using native plants. It can help guide shoreline developers and can be used in the counties' public information work.

9. **Development regulations:** Where open space is not preserved and land can be developed, the counties have regulations to ensure new developments meet certain standards. Both have regulations that exceed the minimum standards of the National Flood Insurance Program that are designed to protect new buildings from flood damage.

   James City County prohibits filling to create a buildable lot (all lots must have natural high ground at least one foot above the base flood elevation). This can have a very beneficial impact on natural floodplain functions and is recommended for all communities.

   Permit applicants for new developments that require rezoning or other legislative action are required to inventory their sites for the presence of rare, threatened, and endangered species. If found, there must be consultation with FWS or NMFS to determine how to minimize the impact of the development on those species. Action item 9 calls for a review of the procedures to ensure that the species in this Plan and their likely habitat are included in this process.

   Species: small whorled pogonia, sensitive joint-vetch, sturgeon

   Threat addressed: loss of habitat

   Lead office, Gloucester County: Engineering Services

   Lead office, James City County: Community Development

Appendix F
Letter for Potential Conservation Easement

Good morning, Parker.

We have received the NHDE report for the property in New Kent County. Chickahominy Lake and its tributary streams on and adjacent to the property are part of an aquatic system designated by DCR as the Chickahominy River - Shipyard Creek - Diascund Creek Stream Conservation Unit, due to numerous rare species and significant natural communities associated with these waterways. Two rare species in particular are recently documented from the lake adjacent to the property: Tropical Water-hyssop (*Bacopa innominata*) and Narrow-leaved Spatterdock (*Nuphar sagittifolia*). We recommend this property be managed to preserve water quality and to protect the shoreline from major disturbances, as described in the attached Word document.

Thank you for checking in with us on this project. All the best.

Irv

Irvine Wilson
Natural Area Protection Specialist
Department of Conservation & Recreation
Natural Heritage Program
600 East Main Street, 16th Floor
Richmond, VA 23219
804-786-6745

Department of Conservation and Recreation's Standard Riparian Buffer Recommendations for the Protection of Natural Heritage Resources Associated with Open Space and Conservation Easements
February 18, 2010

When a property being considered for an open space or conservation easement adjoins a waterway that supports natural heritage resources, the Department of Conservation and Recreation recommends the easement include provisions to protect that waterway and any associated tributaries with riparian buffers. These buffers should extend at least 100 feet from the edge of the waterway in areas where the average slope is less than 10%. Buffers should be at least 150 feet wide on slopes of 10-25% and at least 200 feet on slopes greater than 25%. The buffers should be forested and kept free of new construction, soil disturbance and livestock. Timber harvests should be limited to 50% cover (or 50% basal area) of the landward 50 feet of the buffer. Narrower buffers may be acceptable for agricultural practices that are conducted in accordance with a farm conservation plan approved by the U. S. Natural Resources Conservation Service or the local Soil and Water Conservation District.

These recommendations apply if the adjoining waterway is designated by DCR as a Stream Conservation Unit, if the waterway is designated by the Department of Game and Inland Fisheries as Threatened and Endangered Species Waters, or if the waterway is otherwise known to support aquatic natural heritage resources in close proximity to the property.

DCR may provide alternative recommendations, if appropriate for particular natural heritage resources. For example, DCR may recommend riparian areas that support bog turtles be maintained in herbaceous vegetation with occasional grazing.

Appendix G

Virginia Solar Pollinator Resource Tools

Natural Heritage

- About Natural Heritage +
- Natural Area Preserves +
- Rare Species and Natural Communities +
- Information Services +
- Pollinator Smart Solar Site Portal -
  - Comprehensive Manual (PDF)
  - Scorecards
  - Solar Site Native Plant Finder
- Native Plants +
- Invasive Plants +
- Caves/Karst +
- Publications +

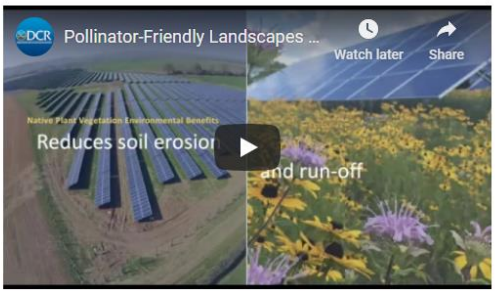
Home » Natural Heritage » Solar Site Pollinator-Smart

Virginia Pollinator Smart

The emerging solar power industry holds in its hands an extraordinary opportunity as decision-makers, engineers and designers consider the impact of their facilities on the landscape. Expertly crafted mixes of native plants can transform a solar facility into a thriving ecosystem that supports pollinator species, birds, and other wildlife, while enhancing facility economic efficiencies.

Learn more about the benefits of native plants on solar sites...

On April 1, 2020 Pollinator-Smart Team members presented a webinar titled "Pollinator Landscapes for Solar Facilities and Beyond" to over 260 participants in lieu of an in-person presentation at the Environment VA Symposium that was cancelled due to COVID-19. This webinar introduces the mechanics of the Virginia Pollinator-Smart Solar Program and goes "beyond" solar by applying the same concepts to other areas of development - such as brownfields, roadsides and transmission lines. Below is a recorded YouTube video of the presentation.



Guidance for Establishing and Maintaining a Pollinator-Smart/Bird Habitat Solar Site

Virginia's Pollinator-Smart program is designed to provide incentives and tools for solar industry to adopt a native plant strategy to meet soil and water control regulations, community needs, and the needs of our biosphere. Below are links to supporting documents for creating pollinator-friendly habitat on a solar facility and meeting the criteria of the Pollinator-Smart certification program.

Developed with input from many stakeholders, natural resource scientists, and environmental policy experts, the materials presented here provide detailed guidance for planning, designing, installing, and maintaining a Pollinator-Smart habitat at a solar facility.

- **Comprehensive Manual** (PDF)
- **Vegetation Monitoring Manual** (PDF)
- **Native Plants Seed Business Plan** (PDF)
- Pollinator-Smart Scorecards
  - **New site** (PDF)
  - **Established site** (PDF)

© DCR-DNH, Gary P. Fleming.

Gold Certified Cople Elementary School Solar Facility in Westmoreland, County (developed by SunTribe). Photo is after first growing season. Click to enlarge.

Virginia Solar Site Native Plant Finder

The Virginia Solar Site Native Plant Finder assists users in identifying native plant species appropriate for the various vegetation requirements at a solar facility and match the needs of pollinators and birds. It also and includes information on commercial availability.

The Native Plant Finder can also help plant industry with finding native species with potential to be developed into new market commodities. Native seed suppliers are invited to share their information for inclusion in the Native Plant Finder database by emailing **pollinator.smart@dcr.virginia.gov.**

- **Solar Site Native Plant Finder**
- Plant Finder guidance is found **here** (PDF).

VA Pollinator Smart Program and Localities

Below is a recorded YouTube video of the September 8, 2020 virtual stakeholder meeting, targeted specifically to city and county governments and local boards. The presentation introduced the Virginia Pollinator-Smart Program and discussed the benefits of participation and ways it can be used to achieve local goals.

Virginia Invasive Plant Species List

The DCR **Invasive Plant Species List** is the result of risk assessment conducted on hundreds of non-native plant species. The list currently identifies 90 species as invasive in Virginia. Invasive species are defined here as non-native species that cause harm to the ecosystem and native species, create economic damage and losses, or pose direct harm to humans. Invasive plant species threaten Pollinator-Smart goals if they are not properly managed at a site.

Establishing a Virginia Native Seed Industry

A goal of the Pollinator-Smart program is to kickstart a robust native seed industry that would be able to serve the coming demand for tens of thousands of acres of native plant materials. The **Native Plants Seed Business Plan** (PDF) builds on knowledge generously provided by established members of the native seed industry and outlines the steps toward a Virginia-based industry that could also serve other surrounding states.

DEQ Solar Site web page

In Virginia, the Department of Environmental Quality has oversight of the establishment of solar facilities. To learn about the permit requirements and opportunities for the solar industry in Virginia, visit the **DEQ Solar Energy** page.

Questions/Comments

If you have questions or comments on the Pollinator-smart program, please contact us at **pollinator.smart@dcr.virginia.gov**

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Virginia Solar Site Pollinator/Bird Habitat Scorecard

VERSION 2.0a

VIRGINIA POLLINATOR-SMART/
BIRD HABITAT SCORECARD
Proposed or Retrofit Solar Sites

DEFINITIONS

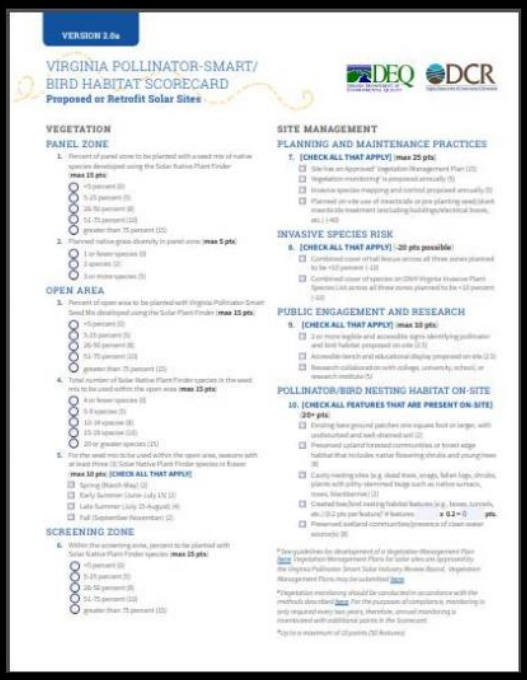
RESOURCES

INSTRUCTIONS

ATTACHMENTS PROVIDED

PROJECT DETAILS & CONTACT INFORMATION

FINAL SCORE



VERSION 2.0a

VIRGINIA POLLINATOR-SMART/
BIRD HABITAT SCORECARD
Proposed or Retrofit Solar Sites

VEGETATION

PANEL ZONE

OPEN AREA

SCREENING ZONE

SITE MANAGEMENT

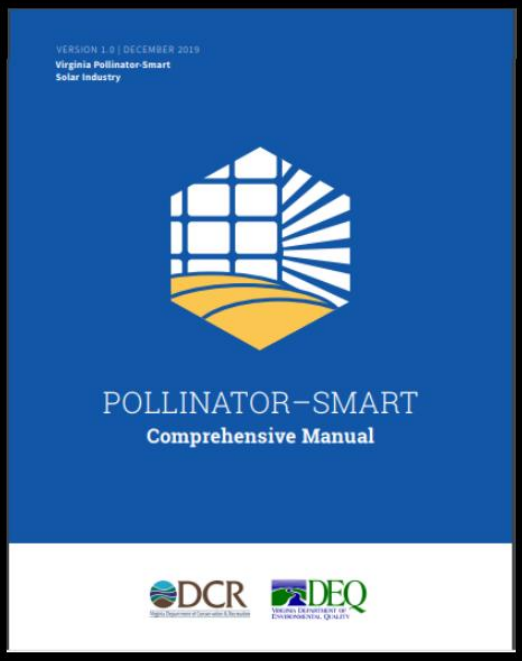
PLANNING AND MAINTENANCE PRACTICES

INVASIVE SPECIES RISK

PUBLIC ENGAGEMENT AND RESEARCH

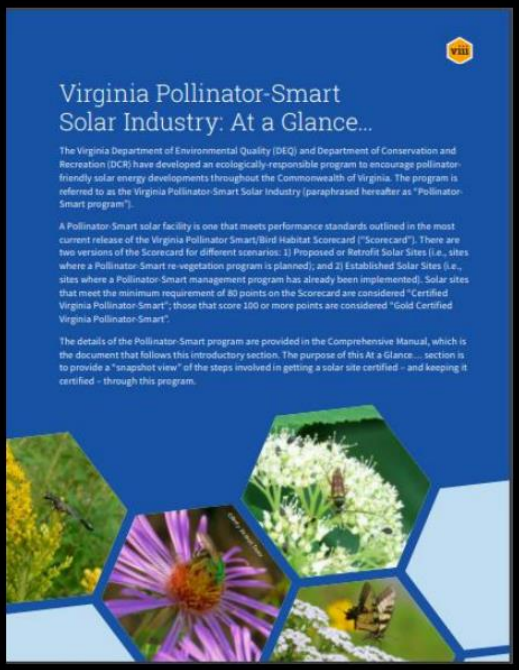
POLLINATOR/BIRD NESTING HABITAT ON-SITE

Virginia Pollinator-Smart Comprehensive Manual



VERSION 1.0 | DECEMBER 2019
Virginia Pollinator-Smart Solar Industry

POLLINATOR–SMART
Comprehensive Manual



Virginia Pollinator-Smart Solar Industry: At a Glance...

The Virginia Department of Environmental Quality (DEQ) and Department of Conservation and Recreation (DCR) have developed an ecologically-responsible program to encourage pollinator-friendly solar energy developments throughout the Commonwealth of Virginia. The program is referred to as the Virginia Pollinator-Smart Solar Industry (paraphrased hereafter as "Pollinator-Smart program").

A Pollinator-Smart solar facility is one that meets performance standards outlined in the most current release of the Virginia Pollinator Smart/Bird Habitat Scorecard ("Scorecard"). There are two versions of the Scorecard for different scenarios: 1) Proposed or Retrofit Solar Sites (i.e., sites where a Pollinator-Smart re-vegetation program is planned); and 2) Established Solar Sites (i.e., sites where a Pollinator-Smart management program has already been implemented). Solar sites that meet the minimum requirement of 80 points on the Scorecard are considered "Certified Virginia Pollinator-Smart"; those that score 100 or more points are considered "Gold Certified Virginia Pollinator-Smart".

The details of the Pollinator-Smart program are provided in the Comprehensive Manual, which is the document that follows this introductory section. The purpose of this At a Glance.... section is to provide a "snapshot view" of the steps involved in getting a solar site certified – and keeping it certified – through this program.

Natural Heritage

- About Natural Heritage +
- Natural Area Preserves +
- Rare Species and Natural Communities +
- Information Services +
- **Pollinator Smart Solar Site Portal** -
  - Comprehensive Manual (PDF)
  - Scorecards
  - Solar Site Native Plant Finder
- Native Plants +
- Invasive Plants +
- Caves/Karst +
- Publications +

Home » Natural Heritage » Virginia Solar Site Native Plant Finder

Virginia Solar Site Native Plant Finder

The Solar Site Native Plant Finder is designed to aid solar site developers by providing a database of native plant species that are commercially available. The database contains information useful in designing a high-quality habitat for pollinators, birds, beneficial insect predators, and other wildlife. Learn more about the **benefits of using native vegetation on solar sites.** More tools and information are on the **Pollinator Smart portal page**.

Using the Finder

For information about a particular native plant species, enter a common or scientific name in the top form, **Search by Name**. Species names in the solar plant finder application are from the Flora of Virginia (2012) and the companion Virginia Flora App (iOS and Android). Help for finding correct scientific names for plant species is also in the **Digital Atlas of Virginia**. Links to the corresponding Digital Atlas page are in query reports.

To generate a list of plants that could suit your specific needs, fill in any field in the Search by Characteristics form, and click "Submit." You may get very specific in listing characteristics. More than one field can be filled in for your query. For example, you might want a list of native plants specific to Halifax County (Location) that are less than 3 feet tall (Max Height) and occur in a sunny (Light Requirement), dry habitat (Moisture Requirement).

The database contains 1600 native plant species. By default, the finder form is set to search for commercially available species. You can change the setting to see all species in the database selecting the blank option. Selecting 'No' will display those species for which we do not currently have identified as available. For each species in the finder, names of providers and links to their websites appear in the query results under "More details."

Query results are printable from your browser's Print menu. To create a spreadsheet of the results, copy and paste the results table into a spreadsheet program, such as Excel or Sheets.

For questions or issues related to the finder, email **pollinator.smart@dcr.virginia.gov.**

How to Use the Solar Site Native Plant Finder (PDF).

Search by Name

COMMON NAME

SCIENTIFIC NAME

Clear All Fields | Submit

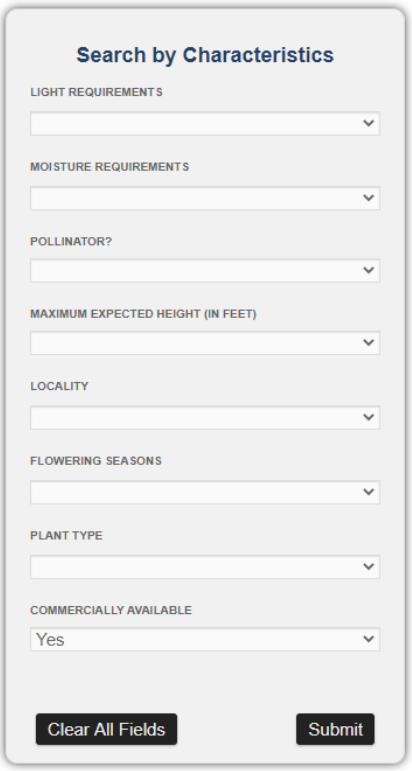


Figure 1. Cople Elementary School Solar Panels before planting

Figure 2. Cople Elementary School Solar Panels after one growing season

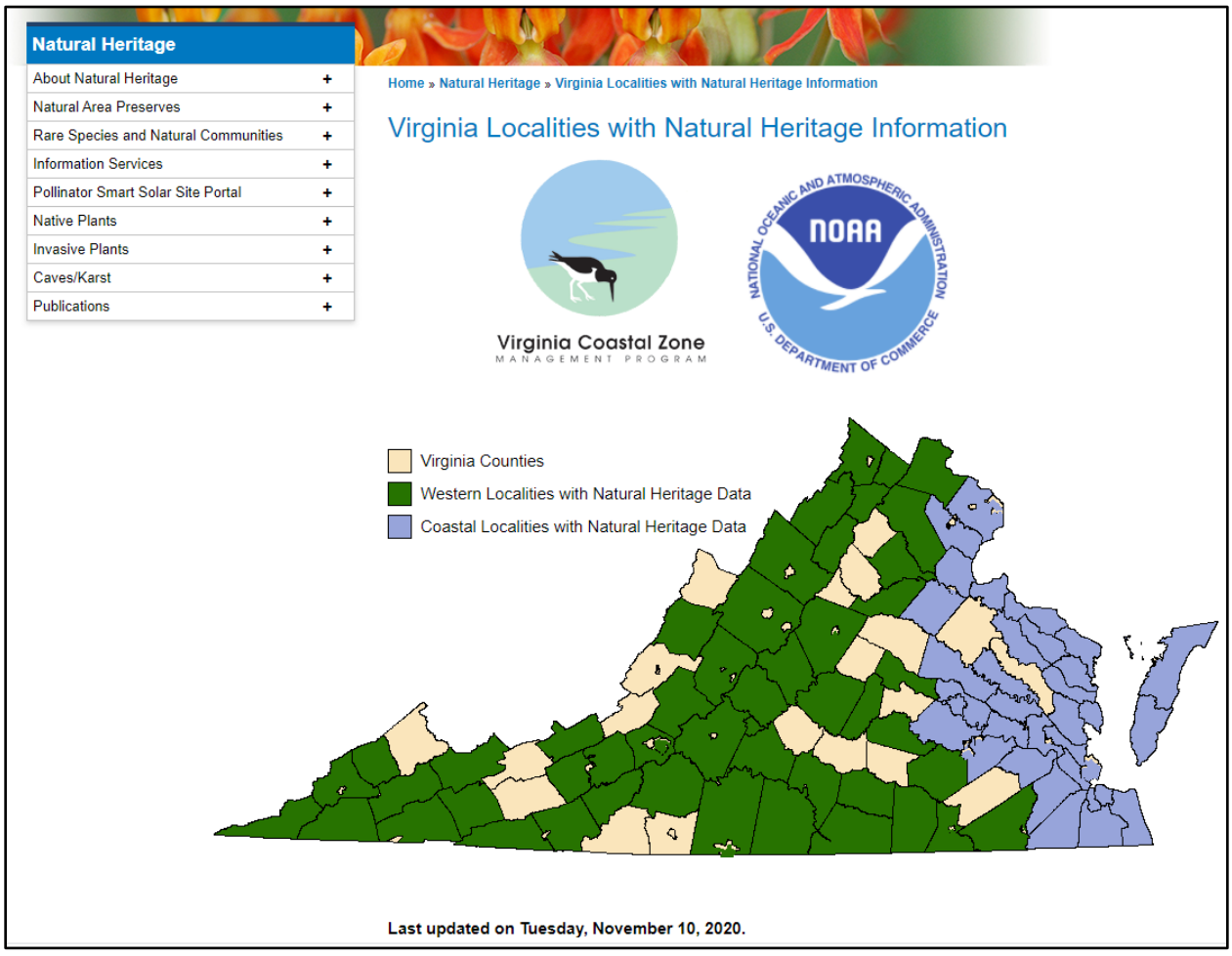
Appendix H

List of Coastal Training Participants for FY19

King and Queen County
Summit Design and Engineering
AECOM
Virginia Department of Transportation-Environmental
Rummel, Klepper & Kahl
USFWS
Department of Conservation and Recreation-Natural Heritage
Department of Conservation and Recreation -Land Conservation Office
Virginia Department of Wildlife Resources
Northern Virginia Conservation Trust
Froehling & Robertson, Inc.
Environmental Resources Management
Vanasse Hangen Brustlin, Inc.
Department of Forestry
City of Norfolk, Department of Transit
Department of Environmental Quality-Office of Ecology, Water Monitoring and Assessment
Department of Environmental Quality-Total Maximum Daily Load
Department of Environmental Quality-Virginia Pollutant Discharge Elimination System
Northern Neck Land Conservancy
Trileaf
Clark Nexsen
Stantec
US Department of Agriculture-Natural Resource Conservation Service
Old Dominion Land Conservancy
Virginia Department of Agriculture and Consumer Services-Office of Plant Industry Services
Department of Conservation and Recreation-Finance Division
Wetland Interagency Review Team
Kleinfelder

Appendix I

Map of Localities with Natural Heritage Information



Appendix J

Quarterly Coastal Species Highlights

Natural Heritage Resource Highlight: Tidal Freshwater Marsh (Arrow-Arum Pickerelweed Type) Global Rarity Rank: G3G4-Vulnerable
State Rarity Rank: S3S4-Vulnerable Legal Status: Not Listed

This Tidal Freshwater Marsh community, the Pickerelweed Tidal Marsh, is codominated by leafy forbs arrow arum and pickerelweed. Associated species can include wild rice, duck potato, sweet leaf, halberdleaf tearthumb, swamp smartweed, arrowleaf tearthumb, and begger ticks spp. Species occurring less frequently can include cattail spp. and jewelweed. At the southern end of the range in Virginia, there is a well-marked variant in which spatterdock is codominant with arrow arum and pickerelweed in variable mixtures. This community occurs low within freshwater tidal marshes on muck substrates of variable depth. There is a long duration of tidal flooding, and the community is exposed only for a short period of time each day when the tide is out, supporting higher mean species richness and containing a number of taxa absent from the low intertidal portions of mudflats. Freshwater tidal marshes are naturally dynamic systems that are best developed where there is a major input of freshwater, a daily tidal range of at least 0.5 m, and a geomorphology that tends to constrict and magnify tidal influence in the upper reaches of the estuary. They are subject to diurnal flooding by tides and seasonal and episodic flooding from river discharge. Plant composition of freshwater tidal marshes generally occurs as a mosaic of patches dominated by a few or a single species. Species composition is determined by species life history characteristics, especially lifeform, phenology and mode of regeneration in response to microhabitat conditions, and the frequency and duration of flooding. Plant composition has seasonal variation. This community type is widespread in Virginia's coastal zone.

Literature Cited

NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: April 7, 2011)

Species Highlight: Sensitive Joint-vetch (*Aeschynomene virginica)*

Global Rarity Rank: G2- Imperiled

State Rarity Rank: S2- Imperiled

Legal Status: Federally and State Listed Threatened

Photo by Zach Bradford, DCR-DNH

Sensitive Joint-vetch is an annual bushy-branched herb that grows to 3 meters tall. It has pinnately-divided leaves with 20-56 leaflets each to 25 millimeters long. The racemes bloom from July to October with up to 6 greenish-yellow flowers with dark red veins. The plants are found in freshwater to slightly oligohaline tidal marshes and adjacent wet ditches and disturbed areas, along freshwater reaches of the James, Chickahominy, Mattaponi, Pamunkey, Rappahannock, and Potomac Rivers and their major tributary creeks (Weakley et al., 2012).

As of 2019, 20 occurrences of this rare plant were documented by the Virginia Natural Heritage Program, 12 extant and 8 historic. The Cumberland Marsh Natural Area Preserve in New Kent County has one of the largest populations of this rare plant in the world. *https://www.dcr.virginia.gov/natural-heritage/natural-area-preserves/cumberland*

Threats include loss of habitat (often from docks and shoreline erosion control) as well as from competition with invasive species (particularly common reed, *Phragmites australis*). Sea-level rise threatens this species as all populations are at or near sea-level.

Literature Cited

Weakley, A.S, J. C. Ludwig, and J.F. Townsend 2012. Flora of Virginia. Bland Crowder, ed. Foundation of the Flora of Virginia Project Inc., Richmond. Fort Worth: Botanical Research Institute of Texas Press. pp. 562-563.

Species Highlight: Dwarf wedgemussel (*Alasmidonta heterodon*)

Global Rarity Rank: G1G2- Critically Imperiled

State Rarity Rank: S1- Critically Imperiled

Legal Status: Federally and State Listed Endangered

The Dwarf wedgemussel is a freshwater mussel that grows to a length of approximately 30 mm. This species inhabits creeks of varying sizes, residing in muddy sand, sand, and gravel bottoms, in areas of slow to moderate current and little silt deposition (USFWS, 1993).

Currently, this species exists in widely scattered, small populations in the Chowan, James, York, Rappahannock, and Potomac River drainages. Its native host fishes include Mottled sculpin (*Cottus bairdi*), Johnny darters (*Etheostoma nigrum*), Tessellated darters (*Etheostoma olmstedi*) and Sculpins (*Cottus* sp.) (Michaelson and Neves, 1995). Please note that this species is currently classified as endangered by the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Wildlife Resources (VDWR).

Considered good indicators of the health of aquatic ecosystems, freshwater mussels are dependent on good water quality, good physical habitat conditions, and an environment that will support populations of host fish species (Williams et al., 1993). Because mussels are sedentary organisms, they are sensitive to water quality degradation related to increased sedimentation and pollution. They are also sensitive to habitat destruction through dam construction, channelization, and dredging, and the invasion of exotic mollusk species. Extant populations of Dwarf wedgemussel are documented from the counties of Stafford, Spotsylvania, Louisa, Lunenburg, Nottoway and Sussex, and historic populations are documented from the counties of Albemarle, Orange, Culpeper, Hanover, and Fauquier.

Recommendations for avoiding impacts to this resource includes the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations during development activities, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow.

Literature Cited

Michaelson, D.L. and R.J. Neves. 1995. Life history and habitat of the endangered Dwarf wedgemussel *Alasmidonta heterodon* (Bivalvia:Unionidae). Journal of the North American Benthol Society 14(2): 324-340.

U.S. Fish and Wildlife Service. 1993. Dwarf Wedge Mussel (*Alasmidonta heterodon*) Recovery Plan. Hadley, Massachusetts. p. 52.

Williams, J.D., M.L. Warren, Jr., K.S. Cummings, J.L. Harris, and R.J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18: 6-9.

Appendix K

Coastal Zone Contact List and Comprehensive Plan (CP) Schedule

Virginia's coastal counties	**CP Status**	**County Contact**
Accomack	2018, 5 year schedule	Tom Brockenbrough, tbrockenbrough@co.accomack.va.us, Katie Nunez, knunez@co.accomack.va.us>
Arlington	2015/16	Alonso Abugattas, Aabugattas@arlingtonva.us
Caroline	2030, adopted 2010	dnunnally@co.caroline.va.us
Charles City	2014	Denise Williams, dwilliams@co.charles-city.va.us
Chesterfield	2019	Rachel Chieppa, ChieppaR@chesterfield.gov
Essex	2015	Susanne Joy, sjoy@essex-virginia.org
Fairfax	2017-2018	Denise James, denise.james@fairfaxcounty.gov
Gloucester	2016	Anne Ducey-Ortiz, aducey@gloucesterva.info
Hanover	2017-2037	David Maloney, dpmaloney@hanovercounty.gov
Henrico	2026	Rosemary Deemer, dee12@henrico.us
Isle of Wight	2019	Kim Hummel, khummel@isleofwightus.net
James City	2015-2035	Ellen Cook, Ellen.Cook@jamescitycounty.va.gov
King George	2013	Kyle Conboy, kylec@co.kinggeorge.state.va.us
King and Queen	2019-2030	Donna Sprouse, dsprouse@kingandqueenco.net
King William	2016	Betty Brooks, bbrooks@kingwilliamcounty.us
Lancaster	2013	Don Gill, dgill@lancova.com
Mathews	2011-2030	Thomas Jenkins, tjenkins@mathewscountyva.gov
Middlesex	2015	Marc Longest, m.longest@co.middlesex.va.us
New Kent	2012	Kelli Le Duc, klleduc@newkent-va.us
Northampton	2019	Susan McGhee, smcghee@co.northampton.va.us
Northumberland	2016	E. Luttrell Tadlock, ltadlock@co.northumberland.va.us
Prince George	2014	Matt Blaes, mblaes@princegeorgeva.org
Prince William	2019	Tom Dombrowski, Tdombrowski@pwcgov.org
Richmond	2013	Hope D. Mothershead, hmothershead@co.richmond.va.us
Spotsylvania	2018	Jacob Pastwick, jpastwik@spotsylvania.va.us

Virginia's coastal counties	**CP Status**	**County Contact**
Stafford	2016-2036	Ben Foster, BFoster@staffordcountyva.gov, Joe Fiorello, jfiorello@staffordcountyva.gov
Surry	2040	William Saunders, wsaunders@surrycounty.va.gov
Westmoreland	2010-2030	Beth McDowell, bmcdowell@westmoreland-county.org, Darrin Lee, dlee@westmoreland-county.org
York	2013-2035	Timothy Cross, tcross@yorkcounty.gov
Virginia's coastal cities		
Alexandria	1992, ongoing	Karl Moritz, karl.moritz@alexandriava.gov
Chesapeake	2016-2035	John Harbin, jharbin@cityofchesapeake.net
Colonial Heights	2015	Kelly Hall, hallk@colonialheightsva.gov
Fairfax	adopted 2/1/2019	Stefanie Kupka, StefanieKupka@fairfaxva.gov
Falls Church	2017-2040	Jeremy Edwards, jedwards@fallschurchva.gov
Fredericksburg	2015	Kevin Utt, kwutt@fredericksburgva.gov
Hampton	2006-2040	David Imburgia, dimburgia@hampton.gov
Hopewell	2018-2028	Tevya Griffin, tgriffin@hopewellva.gov
Newport News	2018-2040	Tammie Organski, torganski@nnva.gov
Norfolk	2013-2030	Anne Doyle, anne.doyle@norfolk.gov
Petersburg	2014	Reginald Tabor, rtabor@petersburg-va.org,
Poquoson	2018-2035	Wally Horton, charles.horton@poquoson-va.gov, Danielle Quick, danielle.quick@poquoson-va.gov
Portsmouth	2018	Juliet Walker, jthwalker@cityofportsmouth.com, Peter Britz, plbritz@citytofportsmouth.com
Richmond	Ongoing, Richmond 300	Mark Olinger, MARK.OLINGER@RICHMONDGOV.COM
Suffolk	2015-2035	Brian Smith, bsmith@suffolkva.us, Michael Kelly, mkelly@suffolkva.us
Virginia Beach	2016-2040	Robert "Bobby" J. Tajan, Rtajan@vbgov.com
Williamsburg	currrently updating	Carolyn Murphy, cmurphy@williamsburgva.gov